

William Paley (1743–1805)

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1 Introduction

Though traces of ‘economic thought’ in Cambridge may be detected as early as the 1770s, the earliest example to appear in print is contained in William Paley’s *The Principles of Moral and Political Philosophy* (1785), which brought its author instant fame and fortune. On the strength of its Book VI, Chap. XI, Maynard Keynes conjectured that ‘Perhaps, in a sense, *he* [rather than Malthus] was the first of the Cambridge economists’ (Keynes 1933 [1972]: 79, fn. 2).

William Paley (1743–1805) was a Yorkshire man and was mildly derided at Cambridge for speaking Latin with a Yorkshire accent. He was son of a clergyman and Cambridge graduate who became Master of Giggleswick School. The biographical information that follows is adapted from Waterman (2011).

I acknowledge with gratitude the generous assistance of Mr Nicholas Rogers, archivist of Sydney Sussex College, Cambridge University, for giving me access to the Hey archive and for transcribing material from Volume III of Hey’s ‘Lectures in Morality’. I also wish to acknowledge permission from Oxford University Press to make unrestricted use of Waterman (1996), much of which is incorporated in parts III and IV of this chapter. Also, I am very grateful to Dr Neil Hitchin for showing me his as yet unpublished report on Paley’s lecture notes, which include detailed notes of the lectures on ‘Moral Philosophy’ made by W. Thomas, son of Hugh Thomas, Master of Christ’s during Paley’s tenure as a Fellow and an undergraduate student of the college from 1774 to 1779.

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15 Paley was born in Peterborough in July 1743 where his father, the Revd
16 William Paley, was a minor canon of Peterborough before his appointment to
17 Giggleswick in 1745, upon which the family returned to Yorkshire. Like his
18 father, the younger William went up to Christ's College, Cambridge, where
19 he matriculated in 1759, graduating BA in 1763 as 'senior wrangler', mean-
20 ing that his was the highest performance of all Tripos candidates in that year.
21 After 3 years of school teaching in Greenwich, he was elected fellow of Christ's
22 in 1766 and ordered deacon. In 1767, he was ordained priest and graduated
23 MA. He was awarded the Doctor of Divinity degree in 1795 for his *Evidences*
24 *of Christianity* (1794), which remained on the reading list for 'Little Go'
25 (Cambridge Previous Examination) until the 1920s.

26 For 10 years after election as fellow, Paley occupied various college offices
27 and played a large part in teaching undergraduates. At that time, this was
28 almost entirely conducted in the colleges by college lecturers and tutors. The
29 few university lectures delivered by a small handful of professors were optional
30 and scantily attended. But college classes were compulsory. All undergradu-
31 ates faced a common curriculum designed to prepare the next generation of
32 clergymen, magistrates, and legislators for their public duties in a Christian
33 society: the Latin and Greek classics supplemented in some colleges by bibli-
34 cal languages and literature, and some reading in 'moral and political philoso-
35 phy'. Many undergraduates went down after 1 or 2 years of this, and most of
36 those who remained in residence received the ordinary BA without examina-
37 tion, after keeping the requisite number of terms.

38 A small minority of ambitious students who needed to make their way
39 in the world, and who were usually of relatively humble origins, sought an
40 honours degree and competed in the Tripos examinations. These consisted of
41 five public disputations in Latin, using Aristotelian logic, on theses accept-
42 able to the Moderators. However, by the middle of the eighteenth century,
43 the oral tests were supplemented by a written 'Senate House Examination' in
44 mathematics—the first written examinations in any university of the Western
45 world. Candidates for honours therefore supplemented their other studies
46 with Newtonian 'natural philosophy' and mathematics.

47 Paley was soon known throughout Cambridge as a superb teacher, and
48 many students came from other colleges to attend his lectures. A later com-
49 mentator wrote of Paley's 'utter inability to be obscure' (Annan 1984: 244).
50 In all probability, Paley taught the entire curriculum with the exception of the
51 classics, in addition to mathematics and natural philosophy for Tripos candi-
52 dates in Christ's College.

53 In 1776, 10 years of hard work—with the assistance of patronage—
54 brought its reward. Paley was preferred to the rectory of Great Musgrave,

Westmorland. Thus, at last he was able to marry, resigning his fellowship as 55
 was then required. His wife, Jane Hewitt of Carlisle, bore him ten children, 56
 two of whom died in infancy. He remained in the diocese of Carlisle for the 57
 rest of his career, on terms of cordial friendship with his mentor, patron, and 58
 ecclesiastical superior, Edmund Law, Bishop of Carlisle (1768–1787), who 59
 had been a Fellow of Christ’s in the 1730s, and Master of Peterhouse and 60
 Knightsbridge Professor of Philosophy when Paley was a young man. Paley’s 61
 energy and efficiency soon led to his promotion as Archdeacon (1782) and 62
 Chancellor (1785). But he also held benefices later in the dioceses of Lincoln 63
 and Durham, and in 1796, he moved to Bishop Wearmouth in Durham 64
 whilst remaining Archdeacon of Carlisle. He was exemplary in parochial and 65
 diocesan duties, active in promoting education of the poor, and a leader in 66
 the campaign to abolish the slave trade. He also advocated tithe reform and 67
 supported independence for the American colonies. His first wife having died 68
 in 1791, he married Catherine Dobson of Carlisle in 1795. Paley died on 15 69
 May 1805 after a lingering and painful illness, during which he completed his 70
 last book, *Natural Theology* (1802). He is buried in Carlisle Cathedral. 71

Paley’s daughter, Mary, was grandmother to Mary Paley (1850–1944), who 72
 was among the first five women to enter Newnham College when it opened 73
 its doors in 1875. She read for the Moral Sciences Tripos and married her 74
 economics instructor, Alfred Marshall. 75

Soon after leaving Cambridge, Paley was urged by his bishop and other 76
 friends to write up his college lectures for publication. He began with *Moral and* 77
Political Philosophy (1785), a spectacular success for which his publishers paid 78
 £1000—more than Malthus was to earn from all his books in a lifetime. It was 79
 almost at once adopted as a required text for all undergraduates at Cambridge, 80
 went through 20 English editions by 1814 (15 in Paley’s own lifetime) and 10 81
 American editions by 1821. In the USA, it remained ‘the most popular text 82
 on moral philosophy from the 1790s to the Civil War’ (Haddow 1939: 67). 83
 Though long superseded as a textbook, its sparkling lucidity still had appeal for 84
 the discriminating in the twentieth century: ‘If anyone will take up again Paley’s 85
Principles’, Keynes declared in 1933, ‘he will find, contrary perhaps to his expect- 86
 ation, an immortal book’ (Keynes 1933 [1972]: 79, fn. 2). 87

The first five books of *Principles* are concerned with moral philosophy: 88
 obligation and duty—to God, to our neighbour, and to ourselves. Book VI 89
 contains ‘Elements of Political Knowledge’, with chapters on government, 90
 obedience and civil liberty, the British constitution, the administration of jus- 91
 tice, and religious and military establishments. 92

Since there can be no obligation to do that which is unfeasible, moral, and 93
 political philosophy must entail some positive investigation of the economic 94

95 and social circumstances to which normative principles apply. Therefore an
 96 element of what we now call ‘economic analysis’ is always to be found, implicit
 97 or explicit, in almost all expositions of political philosophy at least since Plato’s
 98 *Republic*. What we might think of now as Paley’s ‘economic thought’ was
 [AUG] neither ‘political œconomy’ in the sense of either Sir James Steuart or Adam
 100 Smith nor ‘economics’ as later conceived by his great-grandson-in-law. It is
 101 entirely contained in the penultimate chapter of *Principles*, Book VI, Chap.
 102 XI: ‘Of Population and Provision’, which, though only 1 out of 88 chapters,
 103 is long and complex and comprises 8 % of the entire text.

104 What follows consists of three parts. Much of the material, especially in
 105 the second and third parts, is adapted from Waterman (1996), some of it
 106 verbatim.

107 *Firstly*, An examination of Paley’s method of thought: the intellectual context
 108 of mid-eighteenth-century Cambridge in which it emerged including such
 109 evidence as there is of economic thinking by his Cambridge contemporaries;
 110 his individualist, proto-utilitarian view of society; and the possible
 111 influence of other eighteenth-century authors such as Bernard Mandeville,
 112 David Hume, George Berkeley, Steuart, and Smith.

113 *Secondly*, A formalisation of Paley’s implicit demand-led, two-sector macro
 114 model: the stability of its equilibrium and the possibility of comparative
 115 statics, its generalisation of Mandeville’s *Fable of the Bees*, its explicit recog-
 116 nition of what is perhaps the first example of optimisation in economic
 117 thought; and other economic topics in ‘Population and Provision’.

118 *Thirdly*, A consideration of what may have led Keynes, writing in the early
 119 1930s when his own economic thinking was in flux, to be so impressed by
 120 Paley’s analysis, and to think of him as ‘the first of the Cambridge
 121 economists’.

122 2 Paley’s Method of Thought

123 The Cambridge Context of Paley’s Economic Thought

124 Since Paley included some analytical treatment of economic matters in Book VI
 125 of *Principles*, and since this is presumably based, like Books I–V, on his college
 126 lectures, it seems highly probable that at least some tutors and lecturers in other
 127 colleges did the same. A great deal of what we now recognise as ‘economic litera-

ture’, both in French and in English, was becoming available to the learned from about the middle of the eighteenth century, and it is unlikely that Cambridge dons—who were an important part of a very small intellectual elite in England at that time—would not have been aware of it. But evidence of this is hard to come by. Hints may be found here and there in correspondence between undergraduates and their parents, for example, such as that between ‘Bob’ Malthus and his father, or Philip Yorke and Lord Hardwicke (Searby 1997: 545–561). However, no one has yet attempted the immense and possibly fruitless task of collecting all surviving correspondence and extracting such information from it.

One straw in the wind has recently come to light, however. A contemporary of Paley’s, John Hey (1734–1815), like him a Yorkshire man and almost certainly a friend and fellow member of the Hyson Club (founded in 1758 by wranglers), was a fellow and tutor at Sidney Sussex College from 1758 to 1779. In 1780, he became the first Norrisian Professor of Divinity, and there is evidence that Malthus attended his university lectures in that chair. During the 1770s, Hey gave a series of college lectures on ‘morality’ for his Sidney Sussex pupils which attracted the voluntary attendance of undergraduates from other colleges including William Pitt the Younger, then (1773–1776) at Pembroke College.

In 1997, whilst conducting research for an article on Hey in the *New Dictionary of National Biography*, I discovered in the archives of Sidney Sussex nine bound volumes of his unpublished ‘Lectures on Morality’ which had been deposited by his brothers after his death in 1815 and which, so far as I have been able to discover, have never been looked at by anyone since. The manuscript had been intended for publication, and Volume I (p. 7) contains a ‘Preface’, written in 1814, which includes the following passage:

I do not recollect at what time D^r Paley began to read in morality at X’s College; but as we were contemporary readers, it has always seemed best to me to let our disquisitions be independent of each other. For this reason only I have abstained from reading D^r Paley’s Moral Philosophy, tho’ I have perused all his other works with attention and admiration. I have not in the least thought of setting my lucubrations in any competition with his Moral Philosophy

Hey’s Norrisian *Lectures in Divinity* had been highly successful and continued in use throughout the Anglophone world—including both Canada and Australia—into the 1840s. But despite repeated attempts, he could find no publisher for his Lectures in Morality: for alas, Hey’s ‘lucubrations’ were indeed in competition with those of his colleague. Moreover, after 1785 there was room only for one textbook in that field: ‘D^r Paley’s Moral Philosophy’.

165 It is instructive to compare Hey's treatment of economic matters with
 166 Paley's. Though there is an answer to Mandeville in Volume I, there is no
 167 attempt to formulate a macroeconomic model of the interdependence of
 168 'luxuries' and necessities. But in Volume III, there are seven lectures on 'per-
 169 mutatory contracts' relating to the exchange of goods and services; to the
 170 nature and use of money; to buying and selling; and to the letting and hiring
 171 of persons, things, and money. Although the intention is normative and the
 172 treatment at times quasi-legal, analysis is never far below the surface.

[AU33] I confess I have never in any author seen the idea of *value* or *price* made clear and
 174 satisfactory, tho' all authors who have written on natural law, have offered expla-
 175 nations of it. This makes me desirous to convey *my* idea, by way of trying
 176 whether it will be more satisfactory. (Hey (deposited 1815): Volume III, 1325;
 177 underlining in original)

178 Hey suggests that the best way 'to conceive the value of anything according
 179 to men's general wants' would be 'to suppose all men bidding for it at an uni-
 180 versal *auction*'. Hence 'the *value* of any one thing, when x of them are saleable,
 181 is the x th part of the least sum which only x persons could be prevailed upon
 182 to give up for them all' (ibid.) In developing this idea Hey's exposition seems
 183 to be a possible source of the first-ever formal demand function, which was
 184 specified by Malthus (1800) 24 years later. As with Malthus, Hey seems to
 185 have had in mind a demand function of price interacting with a price-inelastic
 186 supply curve that may shift from time to time. If there was a characteristically
 187 'Cambridge' way of conceiving value theory in the eighteenth century, Hey's
 188 lectures are important evidence of it. He may even perhaps be enrolled, along
 189 with Smith and Malthus, among the pioneers of the supply-and-demand
 190 approach to value theory that 'won out ultimately' (Schumpeter 1954: 482)
 191 over the labour theory of value maintained by Ricardo and Marx.

192 The lectures in Volume III on 'economic' topics are variously dated from
 193 12th to 21st November 1776, by which time Paley had quitted Cambridge for
 194 Cumberland. Neil Hitchin's recent discovery of a student's notes of Paley's lec-
 195 tures suggests that they were delivered, possibly on several occasions between
 196 1775 and 1776, probably in 1775 itself; and that manuscript copies of his
 197 lecture notes circulated in Cambridge after his departure (Hitchin n.d.). This
 198 evidence is consistent with Hey's recollection that he and Paley were 'contem-
 199 porary readers'. Yet it is remarkable that there could have been so little intel-
 200 lectual contact (at least about their teaching) between two friends working
 201 in almost neighbouring colleges, and also that there should have been such
 202 dissimilarity in their college lectures on the same topic. Like Hey's, Paley's

lectures (or at any rate his book which is based on them) contain treatment of contracts: of sale, of hazard, of lending, and of labour (Paley 1785: Book III, Part I, Chaps. VI–XIV). But there is no trace of the economic analysis with which Hey informed his exposition of these topics. Paley may have been ‘the first of the Cambridge economists’, but value theory played no part whatsoever in his thinking. Hey, on the other hand, had nothing to say about anything we would now call macroeconomics.

3 Utilitarian Ethics and Methodological Individualism

In one very important respect, however, Paley and Hey were at one. The normative social theory of each was utilitarian in the original, Cambridge, sense. Utilitarian ethics seem to have originated with John Gay’s ‘Dissertation concerning the Fundamental Principle of Virtue or Morality’ published as a preface to the English translation by Paley’s patron Edmund Law (1731) of William King’s *De Origine Mali* (1702). Gay, who was a Fellow of Christ’s from 1724 to 1732, argued that the happiness of mankind is willed by God, and therefore that humans are obliged to act so as to maximise the happiness of their fellow creatures. This position seems to have been taken for granted in Cambridge from the mid-eighteenth century and would undoubtedly have been taught at Christ’s when Paley was an undergraduate (1759–1763)—as it had been when his father was an undergraduate during Gay’s tenure as a Fellow. Paley develops the theme in *Principles*, which was almost contemporaneous with Jeremy Bentham’s *An Introduction to the Principles of Morals and Legislation* (1789). Bentham’s utilitarianism is sometimes characterised as ‘Paley with God left out’. Paley begins his ‘economics’ chapter in *Principles* by declaring that ‘The final view of all rational politics is to produce the greatest quantity of happiness in a given tract of land’ (Paley *ibid.*: 587). In Hey’s lectures on contracts, ‘the good of mankind’ is similarly normative (e.g. Hey *ibid.*: Volume III, 1280–1281).

Utilitarian thinking is congruent with both political and methodological individualism. The latter was implicit in much eighteenth-century economic thought, as in *Wealth of Nations* in which the individual decision-maker, each independent master acting entirely for his own benefit, is the prime mover (see Arrow 1994). But Paley seems to have been the first economic thinker to make explicit the assumptions of both kinds of individualism. At the outset of ‘Population and Provision’, he states his position in a passage the first sentence of which foreshadows a somewhat similar declaration by British Prime Minister Margaret Thatcher:

240 [A]ltho' we speak of communities as sentient beings; altho' we ascribe to them
 241 happiness and misery, desires, interests and passions, nothing really exists or
 242 feels but *individuals*. The happiness of a people is made up of the happiness of
 [AU243] single persons; and the quantity of it can only be augmented by encreasing the
 244 number of the percipients, or the pleasures of their perceptions. (Paley *ibid.*:
 245 587–588; italics in original)

246 In one interesting respect, the penultimate clause of this affirmation is
 247 eccentric. How can 'the happiness of a people' possibly be 'augmented by
 [AU248] encreasing the number of the percipients'?

249 Paley assumed—subject to important qualifications—that the 'happiness'
 250 of each individual is rather like his weight: it could be represented as a scalar
 251 magnitude and thereby aggregated with those of others in order to get a total
 252 happiness (weight, etc.) of the relevant social unit: '[T]he collective happi-
 253 ness will be nearly in the exact proportion of the numbers, that is, twice the
 254 number of inhabitants will produce double the quantity of happiness' (*ibid.*:
 255 588). Moreover, although this only holds true in 'adjoining periods, in the
 256 same country', in general 'it may, and ought to be assumed in all political
 257 deliberations, that a larger portion of happiness is enjoyed among *ten* per-
 258 sons, possessing the means of healthy subsistence, than can be produced by
 259 *five* persons, under every advantage of power, affluence and luxury' (*ibid.*:
 260 588–589).

261 In effect, Paley has implicitly formulated the first social welfare function:
 262 'collective happiness' $U = U(N)$, where N is population and $U' > 0$. In the
 263 macroeconomic analysis which occupies much of the rest of his 'econom-
 264 ics' chapter, maximisation of population is the policy goal. It is essential to
 265 distinguish Paley's reasons for this from those of the 'political œconomists'
 266 of the seventeenth and eighteenth centuries for whom the maximisation of
 267 population was likewise a policy goal. Political œconomists from Antoine de
 268 Montchrétien to Steuart sought to increase the wealth and military power
 269 of the nation state. Population was merely instrumental: more bodies meant
 270 lower wages and larger armies. Their normative criterion was the welfare of
 271 *le roi soleil* and other heads of state. Paley was radically 'modern' in iden-
 272 tifying the welfare of individuals, rather than that of the sovereign, as the
 273 proper object of public policy: 'The riches, strength, and glory of nations...
 274 have no value farther than as they contribute to...the happiness of a people'
 275 (*ibid.*: 587).

4 Other Possible Influences on Paley’s Economic Thought 276 277

By the third quarter of the eighteenth century, a great deal of what become ‘political economy’ in the nineteenth century and ‘economics’ in the twentieth had begun to circulate in informed circles in France, Italy, Scotland, and England, and the outlines of a common body of knowledge can be identified:

- (a) Agriculture normally affords more food than is necessary to feed those who produce it. 282
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- (b) The cost of production—of food as of all other commodities—will not normally be incurred unless there is an expectation of an adequate return: ‘effectual demand’ is thus a necessary condition of production. 284
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- (c) Since manufactured goods need inputs from agriculture (food to sustain manufacturers), an urban manufacturing sector can provide a demand for the agricultural surplus. 287
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- (d) In the same way, a rural agricultural sector can provide demand for a manufacturing surplus, hence the two sectors are mutually sustaining. 290
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- (e) Labour needed in production is produced by human beings supplied with food (and manufactured necessities). 292
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- (f) A certain per capita average of food and other necessities will keep population and work force stationary. At higher income than this, these will grow and vice versa. 294
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Proposition (f), sometimes thought of as ‘Malthusian’ but actually commonplace among all eighteenth-century authors, is at the centre of Smith’s theory of wages (Smith 1776 [1976]: Book I, Chap. viii, 39). Propositions (c), (d), and (f) are classically illustrated in Smith’s (*ibid.*, Book III, Chap. i) ‘Of the Natural Progress of Opulence’, which describes and discusses the standard eighteenth-century, two-sector general equilibrium model of the interdependence of ‘town’ and ‘country’ (Waterman 2001). Proposition (b) was noted by the Physiocrats among others, and proposition (a) seems to have been taken for granted by all. Though it is evident that Paley was familiar with these ideas and indeed made them the focus of his own analysis, he gave us no help in discovering his sources.

In addition to this common core associated in particular with Mandeville, Richard Cantillon, François Quesnay, and Smith, Paley is also seemingly aware

309 of many other elements of eighteenth-century economic thought to be found
 310 in John Locke, Hume, Berkeley, Steuart, and Josiah Tucker. Paley's treatment
 311 of money, for example, like Hey's (*ibid.*: Volume III: 1335–5), seems obvi-
 312 ously to depend on Hume: but whereas Hey acknowledged this source, Paley
 313 did not. Paley's understanding of the effects of technical progress (Paley 1785:
 314 629–631) as also his ranking of export industries by labour intensity (*ibid.*:
 315 612–614) may have come from Steuart. Yet only Berkeley's 'walls of brass, fifty
 316 cubits high' appear with attribution (as they do in Malthus). What Paley seems
 317 *not* to know about, or at any rate not to think important enough to teach his
 318 undergraduates, are: (a) price theory as found incipiently in Smith, (b) general
 319 equilibrium in competitive markets as pioneered by Pierre Le Pesant, sieur de
 320 Boisguilbert, and (c) the virtues of laissez-faire as taught by the Physiocrats.
 321 The last is in marked contrast to his somewhat older (Oxonian) contempo-
 322 rary, the Revd Josiah Tucker (1713–1799), whose praise of the self-regulating
 323 market economy was later echoed by Smith.

324 Although Paley's lectures were delivered at the latest 1 year before the
 325 appearance of *Wealth of Nations* in March 1776 (the year he left Cambridge),
 326 the occurrence of certain passages in *Principles* which read like summaries of
 327 Smith's work suggests the possibility that Paley did read it sometime between
 328 1776 and 1785, and incorporated some of its ideas in his revision. For exam-
 329 ple, Paley's remark that population may double in 20 years (Paley *ibid.*: 590)
 330 resembles that in Smith (1776 [1976]: Book I, Chap. viii, 23) where the period
 331 is 25 years. His account of money, property, and power (*ibid.*: 604) could be a
 332 digest of a similar argument in Smith. Smith's famous trio, 'the butcher, baker,
 333 brewer' crops up in Paley, as does the assumption that 'the only spring which
 334 keeps human labour in motion' is 'the exclusive right to the produce' (*ibid.*:
 335 606, 602). However, any conclusion on the basis of such evidence can only be
 336 conjectural, for Paley explicitly declined to acknowledge his sources:

337 I have scarcely ever referred to any other book, or mentioned the name of the
 338 author whose thoughts, and sometimes, possibly, whose very expressions, I have
 339 adopted. My method of writing has constantly been this; to extract what I could
 340 from my own stores and my own reflections in the first place; to put down that;
 341 and afterwards to consult upon each subject such readings as fell in my way:
 342 which order, I am convinced, is the only one whereby any person can keep his
 343 thought from sliding into other men's trains. (*ibid.*: xi)

344 As Paul Samuelson (1946: 197) said of Lord Keynes: '[H]is was one of
 345 those original minds which never accepts a thing as true and important unless
 346 he has already thought it through for himself.'

5 Economic Analysis in ‘Of Population and Provision’

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The Interdependence of ‘Provisions’ and ‘Luxuries’

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At the centre of Paley’s argument in ‘Of Population and Provision’ is a clearly thought-out account of the interdependence of production, employment, and population between a rural sector supplying ‘provisions’ and an urban sector (‘flourishing cities...populous towns’ (Paley 1785: 609) supplying ‘luxuries’.

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It appears...that the business of one half of mankind is, to set the other half at work; that is to provide articles, which, by tempting the desires, may stimulate the industry, and call forth the activity of those, upon the exertion of whose industry, and the application of whose faculties, the production of human provision depends. (ibid.)

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If a stable equilibrium exists in this system of mutual causation, total population and therefore ‘collective happiness’ may be determined. We can examine this possibility by means of a formal reconstruction of Paley’s text.

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Suppose an annual amount of ‘provisions’, P , is produced by the employment of A units of *agricultural* labour only. Suppose the annual food requirement of each worker is p , a constant of nature. ‘Since the soil will maintain many more than it can employ’ (ibid.: 608), A units of agricultural labour can only be employed if there is an effectual demand for provisions, P^D , which exceeds food producers’ own consumption by the amount $(P - pA)$. In a closed economy without government this can come from only two sources: the expenditure on food by workers in other sectors, and the expenditure upon food by landlords for their own and their dependents’ (servants’, retainers’, etc.) consumption.

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It is therefore evident that annual production and employment in agriculture can only be sustained if non-agricultural workers and landlords receive and spend the appropriate amounts: ‘The plenty of provisions produced...affords subsistence to individuals only in proportion as it is *distributed*. Now there is but one principle of distribution that can ever become universal, namely the principle of “exchange”’ (ibid.: 604; italics in original). Hence ‘the sale of provisions depends upon the number...of those who have the fruits of some other kind of industry to tender in exchange’ (ibid.: 605–607). Following Paley, who clearly had Mandeville in mind at this point (ibid.: 596; cf. Mandeville (1732 [1988]: Book I, 107–123) we may group all non-provisions as ‘luxury’ goods.

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Suppose an annual quantity of ‘luxury’ goods, Q , is produced by the employment of L units of *manufacturing* labour only. Suppose the annual

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383 food requirement of workers in the manufacturing sector, as in agriculture, is
 384 p , and the per capita demand for ‘luxury’ goods in each sector is q . Quantities
 385 of P goods are measured in bushels of ‘corn’ per annum, and of Q goods in
 386 yards of ‘cloth’ per annum. Paley had no explicit theory of production and
 387 treated output as demand-determined: ‘*the quantity of provision...will evi-*
 388 *dently be regulated by the demand*’ (Paley *ibid.*: 605; my italics). He recognised
 389 that both ‘the husbandman’ and ‘the landowner’ are ‘entitled to [some share
 390 of] the produce of the soil’ (*ibid.*: 609, 610), but he had no theory of rent.
 391 We must therefore suppose that rent, R (measured in ‘corn’), is exogenously
 392 determined and may treat it as a parameter. Landlords might well spend some
 393 of this on the output of the ‘luxury’ goods sector. But to keep the model as
 394 simple as possible it will be assumed that all rents are spent on personal ser-
 395 vices, that all menial servants spend their wages on provisions only, and that
 396 Q goods are bought by workers only. The essential ingredients of Paley’s two-
 397 sector model of reciprocal demand may therefore be stated as

$$P^D = pA + pL + R \quad (10.1)$$

$$Q^D = qA + qL \quad (10.2)$$

400 where Q^D is the quantity of ‘luxury’ goods produced.

401 It is evident that the amounts of employment in the two sectors, A and
 402 L , are the key variables. Also, it is equally evident that Q goods will only
 403 be produced if the agricultural sector provides the provisions which L work-
 404 ers require. Paley called agricultural labour *productive*, manufacturing labour
 405 *instrumental*, but judged ‘both equally necessary, though the one have no
 406 other object than to excite the other’ (*ibid.*: 609).

407 The question is, what determines employment in each sector? This is not
 408 a question Paley was, or could have been, equipped to answer. What follows
 409 next therefore is a ‘rational reconstruction’ of his text: not what Paley actually
 410 said but what he might have said had he enjoyed the advantages of reading
 411 ‘Economics’ in present-day Cambridge. Rational reconstruction is not his-
 412 tory: but in my opinion, which I have defended elsewhere (Waterman 2003),
 413 it can be a useful tool of history.

414 It is evident that for Paley, employment is an increasing function of the
 415 demand for labour, which in turn depends upon the demand for goods.
 416 However, it must also depend upon the supply of labour. Paley argued that
 417 the supply of labour is a decreasing function of the propensity of workers in
 418 each sector to desire ‘luxury’. In a remarkable passage, which is almost cer-
 419 tainly the chief source of Malthus’s concept of the ‘preventive check’, Paley

noted that ‘men will not marry, to *sink* their place or condition in society’ (ibid.: 596; italics in original; cf. Malthus (1798: 64ff.)). Hence an increase in ‘luxury’ which renders ‘the usual accommodations of life more expensive’ and raises the cost of ‘the established mode of living’, deters marriage and family formation so tending to reduce population and work force (ibid.: 596).

We may therefore take q as an index of the prevailing degree of ‘luxury’ and suppose that an increase in q (other things being equal) would reduce the *supply* of labour. Since an increase in P^D and Q^D (other things being equal) would increase *demand* for labour, we may write sectoral employment as

$$A = A(P^D, q), A_p > 0, A_q < 0, \tag{10.3}$$

$$L = L(Q^D, q), L_Q > 0, L_q < 0. \tag{10.4}$$

When product demand is satisfied in each sector, we may equate P^D with P and Q^D with Q and represent Paley’s story of the interdependence of provisions and ‘luxury’ goods as

$$P = p.A(P, q) + p.L(Q, q) + R \tag{10.5}$$

$$Q = q.A(P, q) + q.L(Q, q), \tag{10.6}$$

two simultaneous equations in P and Q for given values of the constant of nature, p , the behavioural parameter, q , and the exogenous variable, R .

Let the A and L functions be represented in linear form as $A = uP + vq$ and $L = wQ + xq$, respectively, where $u > 0, v < 0, w > 0$ and $x < 0$. Let $v + x = y$, which of course is negative.

Then

$$P = \alpha + \beta Q \tag{10.7}$$

$$Q = \gamma + \delta P \tag{10.8}$$

where

$$\alpha = (pyq + R) / (1 - pu), \beta = pw / (1 - pu), \gamma = yq^2 / (1 - qw), \text{ and } \delta = qu / (1 - qw)$$

The simultaneous determination at equilibrium of *provisions* and ‘luxury’ goods is shown in Fig. 10.1, in which the curve labelled $P(Q)$ plots Eq. (10.7) and $Q(P)$ plots Eq. (10.8). The requirement that $Q(P)$ be steeper than $P(Q)$ is satisfied by the stability condition of the model (see Appendix A).

451 Given Paley’s social welfare function, ‘rational politics’ must seek to maxi-
 452 mise population N , where $N = P/p$ at equilibrium. Therefore, P must be
 453 maximised given the biological food requirement, p . In terms of Fig. 10.1,
 454 this amounts to action which may increase the intercept α , and/or increase
 455 the slope β , and/or increase the (negative) intercept γ , and/or increase the
 456 cotangent δ . Since p is biologically determined, we are left with R , with the
 457 two technical parameters u and w (which may be regarded as reciprocals of the
 458 marginal product of labour in each sector), and the two behavioural param-
 459 eters y and q , the first of which measures the (long-run) response of popula-
 460 tion and labour supply to a rise in customary living standards, the second of
 461 which is the degree of expected and desired ‘luxury’.

462 It is clear from Fig. 10.1 that an increase in R increases α and hence both
 463 P and Q at equilibrium. This is because the greater are rents, other things
 464 being equal, the greater the demand for provisions and hence the greater the
 465 employment of agricultural workers. Paley argued strongly for private prop-
 466 erty in land, and for social arrangements which gave incentives to landlords to
 467 farm, or at least oversee the farming of their own land, so as to maximise rent
 468 (ibid.: 601–603, 633–636).

469 Paley considered the effects of ‘abridgement of labour’ by ‘mechanical con-
 470 trivances’ upon employment and population (ibid.: 629–631). Though the
 471 immediate effect may be technological unemployment, ‘some more general and
 472 remoter consequences’ may ‘increase the demand for work’ hence ‘the quantity
 473 of employment, upon the whole, will gain an addition’ (ibid.: 630). Technical
 474 progress in agriculture reduces u which lowers α , β , and δ , and in ‘luxury’ goods

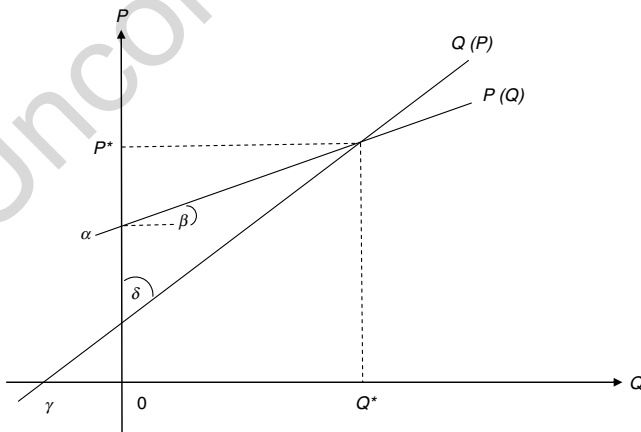


Fig. 10.1 The mutual determination of provisions and ‘luxury’ goods

reduces w which lowers β , γ , and δ . Figure 10.1 therefore captures the initial, technological unemployment, but not the subsequent expansion. This is because the latter depends upon an increase in workers' incomes, so raising α , the effect of which I have not allowed for in Eqs. (10.7) and (10.8). For similar reasons the diagram is not able to illustrate Paley's analysis—obviously derived from Hume (1752 [1994]: 118–120)—of the effect of a 'continual increase' in the money supply, which keeps wages high while it lasts (Paley *ibid.*: 619–621).

The Generalisation of Mandeville and Optimisation

Figure 10.1 is of the most use in illustrating the effect of changes in the two behavioural parameters, y and q . When the supply of labour is independent of the degree of 'luxury', y is zero and so therefore is γ , and α is simply $R/(1 - pu)$. For given values of u , w , and α , the outputs P and Q are as large as possible. The effect of an increase in 'luxury' in these circumstances is unambiguous. δ increases and $Q(P)$ rotates clockwise about the origin, determining a higher equilibrium of P and Q . This case is pure Mandeville 1732 [1988]: Book I, 34, 35). The greater the degree of 'luxury', the greater total production, income, and population. But should Jove convert the bees from 'vice' and turn them to a virtuous frugality, their hive collapses:

[AU8]

As Pride and Luxury decrease...
 All Arts and Crafts neglected lie;
 Content, the Bane of Industry...
 So few in the vast Hive remain,
 The hundredth Part they can't maintain...

For as q (and δ) decline, $Q(P)$ rotates anti-clockwise until it lies along the vertical axis. National product falls to the bare minimum of a subsistence, agricultural economy: $P = \alpha = R/(1 - pu)$, and $Q = 0$.

Paley was deeply aware of the importance of 'luxury' in stimulating employment and industry, and thereby farm production and population: 'The watchmaker, while he polishes the case, or files the wheels of his machine, is contributing to the production of corn as effectually, though not so directly, as if he handled the spade or held the plough' (Paley *ibid.*: 610). He discussed the stimulating effect upon agriculture of trade with large urban centres in a passage which resembles the treatment by Smith (*ibid.*: 610–612; cf. Smith 1776 [1976]: Book III, Chap. i) and may owe something to Hume (1752 [1994]: 98–99). But as I have noted above, Paley was also aware—as Mandeville most certainly was not—that the

510 effect of ‘luxury’ upon production and population cuts two ways. On the one
 511 hand, indeed it stimulates demand, production, and population, but on the other,
 512 by tending to reduce the supply of labour, it has the opposite effect. This is appar-
 513 ent from Fig. 10.1. An increase in q causes $Q(P)$ to rotate clockwise which by itself
 514 would increase output. However, it also causes $P(Q)$ to shift downwards and $Q(P)$
 515 to shift to the left, which by themselves would reduce output.

516 It appears, then, that *luxury*, considered with a view to population, acts by two
 517 opposite effects and it seems probable that there exists a point in the scale to
 518 which luxury may ascend...beyond which the prejudicial consequences begin
 519 to preponderate. The determination of this point, though it assume the form of
 520 an arithmetical problem, depends upon circumstances too numerous, intricate
 521 and undefined, to admit of a precise solution. (Paley *ibid.*: 597–598)

522 Though no ‘arithmetical’ determination of optimum $q = q^*$ is available, a
 523 merely algebraic one may be had. For as Paley’s intellectual grandson Robert
 524 Malthus noted 20 years later, ‘many of the questions, both in morals and in poli-
 525 tics, seem to be of the nature of the problems *de maximis* and *minimis* in fluxions;
 526 in which there is always a point where a certain effect is the greatest, while on
 527 either side of this point it gradually diminishes’ (Malthus 1814 [1986]: 102). By
 528 means of elementary ‘fluxions’, we may differentiate P with respect to q , and so
 529 solve for q^* from the first-order conditions for a maximum of P (Appendix B).

530 6 In What ‘Sense’ Was Paley ‘The First 531 of the Cambridge Economists’?

532 Paley’s Putative Influence on Malthus

533 Keynes set forth his conjecture in his biographical essay on Malthus, written
 534 at a time when his own thinking seems to have been excited and perhaps dras-
 535 tically changed by his Malthusian studies (Kates 1994). Moreover, it is evi-
 536 dent that some of Malthus’s most ‘Malthusian’ ideas are to be found in Paley’s
 537 *Principles*—although to be sure some are also to be discovered in *Wealth of*
 538 *Nations*, which Malthus (alone among Cambridge men of his generation)
 539 probably knew at least as well as *Principles*.

540 Paley’s brief exposition (1785: 589–6) contains virtually the whole of
 541 Malthus’s *population* theory, narrowly considered, including strong hints of
 542 Malthus’s own phraseology: Nature has provided for ‘an indefinite multipli-
 543 cation’ of the human, as of all other species. Under favourable conditions,
 544 human populations double in 20 (not 25) years. There is a ‘tendency’ to

continual increase, but this is countered by ‘checks’ to population, provided males do not indulge in ‘irregular gratifications’. Marriage is the chief cause of population, but ‘men will not marry’ unless they can expect ‘that mode of subsistence to which each class...is accustomed’. Finally, when living standards rise and remain high for long enough, there is a ratchet effect upon the socially determined ‘subsistence’ requirement, for ‘habitual superfluities become actual wants’. Other Malthusian ideas, such as the quasi-Physiocratic emphasis on the strategic importance of agriculture (ibid.: 611–612, 633–636) are also to be found. We need not infer from any of this that Malthus was a “master in plagiarism” (Marx 1954: Book I, 475, fn. 1). As we have seen from Paley’s own example, the unacknowledged use of other, well-known authors was quite acceptable in eighteenth-century Cambridge.

What is lacking in Paley, however, is Malthus’s *production* theory, which, as many have noted, is implicit in, perhaps derived from, the famous ‘ratios’ of food and population increase: specifically the much-derided ‘arithmetical’ ratio (see Waterman 1992). From that seed grew diminishing returns to labour (and capital) in agricultural production, the ‘Ricardian’ doctrine of rent, and the ‘canonical classical model’ (Samuelson 1978). Now, in all versions of ‘classical’ and ‘pre-classical’ political economy, population is constrained by the available food supply. But in the ‘canonical’ tradition, the production of food is governed by diminishing marginal product of the variable ‘labor-cum-capital’ factor applied to a given vector of lands of differing fertility. With competitive factor and product markets, profit-maximising ‘cultivators’ employ capital and labour up to the point at which (composite) marginal product equals (joint) factor payment. In stationary equilibrium, the variable factor return is that at which the growth rates of capital and labour are zero. Employment, production, and population are arrested well short of the ecological maximum, and rent is maximised for given ‘subsistence’ rates of factor payment and the state of technique. Implicit in this account is the assumption that demand for food will always be sufficient to justify cultivators in employing and producing at profit-maximising equilibrium. What this means is that *an increase of ‘luxury’*, interpreted as that component of the socially determined ‘subsistence’ wage in excess of biological requirements, *has only one effect*, which is to reduce the equilibrium levels of production and employment.

Malthus and Archbishop of Canterbury John Bird Sumner, a keen supporter of Malthus’s population theory, based their programme for the ‘improvement’ of the lower orders upon this understanding. Only the prudential check, theologically sanctioned as ‘moral restraint’, could permanently raise both real incomes and relative share of the poor. Thomas Chalmers (1808, 1832), who articulated the sectoral structure of the ‘canonical’ model more fully than any other (see Waterman 1991), was obsessed by this point.

[AU9]

586 Also, on the social importance of population control, Ricardo, James Mill,
 587 and the other ‘Philosophical Radicals’ were wholly at one with Malthus and
 588 ‘Christian Political Economy’.

589 For Malthus and classical economics generally, an increase in ‘luxury’ tends
 590 to *decrease* population. For Mandeville, as we have seen, it tends to *increase* pop-
 591 ulation. Paley is unique in his attempt to recognise both these effects, and per-
 592 haps the first-ever economic analyst to consider the problem of optimisation.

593 **A Proto-Keynesian Paley?**

594 Paley could get the best of both worlds, however, because he ignored scarcity.
 595 Given q , the degree of luxury, the outputs of provisions and ‘luxury’ goods, and
 596 the levels of employment and population are all determined by the exogenous
 597 components of demand in either sector. (In my version, there is only R , but the
 598 point is general.) There is no land scarcity in Paley, no diminishing returns, no
 599 opportunity costs, no relative prices, and no problem of resource allocation.
 600 Though a market-clearing exchange rate ($r = qA/pL$) must exist between provisions
 601 and ‘luxury’ goods, it is never mentioned. There is no consideration of economic
 602 growth. None of the analytical concerns of classical political economy appear:
 603 not even those which are adumbrated in Hey’s lectures. Strictly speaking, Paley’s
 604 economic thought is not really ‘economics’ at all: not at least in any way that could
 605 interest Smith and his successors. I wish to suggest that it is in this second, *method-*
 606 *ological* sense, as much as the first, *historical* sense, that Keynes may have regarded
 607 Paley as ‘the first of the Cambridge [or at any rate, “Keynesian”] economists’.

608 This is illustrated—not to say caricatured—by the model set out on Fig. 10.1:
 609 which is, of course, isomorphic with Romney Robinson’s (1952) analysis of the
 610 interdependence of national incomes in a two-country, ‘Keynesian’ (i.e. under-
 611 employed, fixed price) world. Robinson’s model may well be the high-water mark
 612 of ‘crude Keynesian’ macroeconomics. All supply curves are horizontal, interest
 613 and prices are irrelevant, and the only thing that matters is aggregate demand.

614 Obviously, there are some fundamental differences between Paley’s and
 615 Robinson’s conceptions of the economy, leaving aside (as we may) the fact that
 616 the former deals with one country, the latter with the world. In Robinson’s
 617 model, demand determines supply in the (Marshallian) *short period* because a
 618 given population, workforce, and capital stock are massively underemployed

and all prices are stationary or sluggish. If prices adjusted rapidly, or if full employment were approached, his story would change drastically. In Paley’s model, demand determines supply in the (Malthusian) *long period* because population, and fully employed workforce, is perfectly elastic at the socially determined subsistence wage.

However, what they have in common is precisely what distinguished Keynes’s vision of the economy (during a period from the Michaelmas Term of 1932 to sometime after 1936) from that of all his other predecessors, including Malthus. For although Malthus insisted on the importance of ‘effective demand’ in his controversy with Ricardo, and attempted to make analytical use of the concept in his *Principles* (1820, 1836) [1989], and though it may well be true, as Steven Kates (1994) has persuasively argued, that Keynes actually got his central idea as a consequence of reading the Malthus–Ricardo correspondence in late 1932, the fact remains that Malthus’s model of the economy—inasmuch as there is any such thing—is more than merely demand driven. From one standpoint no doubt, the whole of Chap. VII of *Principles* (Malthus *ibid.*: Book I, 345–373) may be regarded as a vast elaboration of Fig. 10.1. But its exposition is fatally flawed. Land scarcity and diminishing returns are recognised, but they are not integrated with ‘effective demand’ into a coherent model, and at one point, Malthus actually enounces a theorem which is seriously at variance with the predictions of Paley’s purely demand driven model (see Waterman 1996: 685–686). Indeed, so ‘classical’ does Malthus frequently appear in *Principles* that one eminent, present-day economist—presumably unaware of Paley’s demand theory which lies behind portions of this work—has declared that ‘Malthus is not so much an underconsumptionist as a supply-sider’ (Negishi 1989: 152).

Of course, there is more to ‘the economics of John Maynard Keynes’ than mere ‘Keynesian economics’ in Samuelson’s elementary textbook sense. But insofar as the latter may genuinely be discovered in some parts of the *General Theory*, its relentless concentration on the causal nature of aggregate demand has more in common with Paley’s bold reductionism than with Malthus’s conscientious but flawed attempt to do justice to the whole of economic reality. This may possibly have occurred to Keynes when he added the footnote on Paley to his rewritten Malthus essay in the autumn of 1932.

[AU10]

654 **Appendices**655 **Appendix A: Stability of Equilibrium**

656 Let out-of-equilibrium quantity adjustment be specified as

657
$$dP/dt = h(P^D - P); h > 0 \quad (10.9)$$

658
$$dQ/dt = j(Q^D - Q); j > 0 \quad (10.10)$$

659 Then by substitution of the linear versions of Eqs. (10.1) and (10.2) for P^D
660 and Q^D and rearrangement we obtain

661
$$\begin{bmatrix} dP/dt \\ dQ/dt \end{bmatrix} = \begin{bmatrix} -h(1-pu) & hpw \\ jqv & -j(1-qw) \end{bmatrix} \cdot \begin{bmatrix} P \\ Q \end{bmatrix} - \begin{bmatrix} -h(pyq + R) \\ -jyq^2 \end{bmatrix} \quad (10.11)$$

662 Or simply

663
$$d\mathbf{V}/dt = \mathbf{J} \cdot \mathbf{V} - \mathbf{C}. \quad (10.12)$$

664 Now $\text{Det } \mathbf{J} = hj(1-pu-qw)$, and $\text{Tr } \mathbf{J} = -h(1-pu) - j(1-qw)$. (10.13)

665 Thus $(\text{Tr } \mathbf{J})^2 - 4(\text{Det } \mathbf{J}) = [h(1-pu) - j(1-qw)]^2 > 0$.
666

667 Therefore the roots are real and distinct, hence the time paths of $P(t)$ and $Q(t)$
668 out of equilibrium will be non-oscillatory. Also, if $\text{Det } \mathbf{J} > 0$ and $\text{Tr } \mathbf{J} < 0$, the
669 system will be stable. It can be seen from these inequalities that the necessary
670 and sufficient condition for stability is simply that

671
$$(1-pu-qw) > 0. \quad (10.14)$$

672 The graphical requirement, in Fig. 10.1, that the slope of $Q(P)$ should be steeper
673 than that of $P(Q)$, is evidently equivalent to satisfaction of the inequality

674
$$(1-qw)/qv > pw/(1-pu), \quad (10.15)$$

675 which reduces to inequality (10.13).

Appendix B: Optimisation

At equilibrium $d\mathbf{V}/dt = 0$, hence we have the matrix equation $\mathbf{J}\cdot\mathbf{V} = \mathbf{C}$, from which we may obtain P_q by partial differentiation with respect to q and the use of Cramer’s rule. The first-order condition for a maximum of P is that $P_q = 0$, from which we may solve for q^* , ‘that point in the scale to which luxury may ascend...with advantage to the community, and beyond which the prejudicial consequences begin to preponderate’ (Paley 1785: 597).

Since

$$P_q = (\text{Det } \mathbf{J})^{-1} \cdot \text{hj} [py + pywq + pw(uP + wQ)] \tag{10.16}$$

and since $\text{Det } \mathbf{J} > 0$ for stability, the condition $P_q = 0$ permits the solution.

$$q^* = (yw)^{-1} \cdot [-y - w(uP + wQ)]. \tag{10.17}$$

Since y is negative and all other variables positive, $q^* > 0$ as $(uP + wQ) / (-y) > w^{-1}$, the latter is interpreted as the marginal and average productivity of labour in the ‘luxury’ goods sector. It may be seen that if the marginal responsiveness of employment to ‘luxury’ were very small and approached zero, q^* would approach infinity, signifying that there is no limit to the degree to which ‘luxury may ascend...with advantage to the community’: which is Mandeville’s special case.

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AU2	Should 'œconomy' be spelled with a ligature?	
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AU4	Should this be 'increasing'? Please check.	
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AU6	Please check if the word 'Physiocrats' can be lowercased here and in next paragraph.	
AU7	Please specify what 'vbe' means. Does it refer to 'Variable'?	
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