

Before the Tragedy of the Commons: Early Modern Economic Considerations of the Public Use of Natural Resources

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This article distinguishes between the precise legal and economic approach to the commons used by Hardin and many other modern commentators, and the broader post-Hardinian concept utilized in environmentally-oriented discussions and aiming to limit the use of the commons for the sake of preservation. Particularly in the latter case, it is claimed, any notion of the tragedy of the commons is distinctly a modern twentieth-century one, and was foreign to the early modern and even nineteenth-century outlooks. This was true of the early modern mercantilists, and also of classical political economists such as Adam Smith and even, surprisingly, Malthus, as well as of Jevons and his neoclassical discussion aimed at maximizing the long-term use of Britain's coal reserves. One intellectual who did recognize the problematic possibility of leaving some tracts of land in their pristine condition to answer humanity's need for a spiritual connection with nature was J. S. Mill, but even he regarded this as in essence almost a utopian ideal. The notion of the tragedy of the commons in its broader sense is therefore a distinctly modern one.

Was there a concept of the tragedy of the commons before William Forster Lloyd in 1833, the precedent noted by Garrett Hardin himself?¹ If we mean by this an exact concept akin to the modern recognition that population pressure leads to the irrevocable depletion and even destruction of irreplaceable natural resources, then the answer by and large is negative. Even Lloyd's original

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1 Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1244 (1968).

example of the relative lack of impact resulting from a farmer's grazing his cattle on privately enclosed land, as compared to the greater negative impact which ensued when uninhibited grazing occurred on common land, was no more than a simile for his discussion of the effects of child labor on the condition of the lower working class. This was part of his moderate Malthusian views, which departed from Malthus's and Ricardo's positions by supporting poor laws. It was not yet a distinct and detailed theory like Hardin's.²

What did, however, become evident from Malthus onwards was that there might be a problem, both physical and social, of overproduction in relation to the use of natural resources. This was not yet the modern notion of a "tragedy of the commons." It was, however, an emerging recognition that there was such a thing as the commons (without insisting on the precise term), that natural resources were not always infinite, and that a public policy was required to manage their use (even if this management does not limit this use, as Hardin suggests). In other words, the concept (not the term) of a commons was beginning to be recognized, but the tragic consequences of its use were only beginning to become apparent with the early nineteenth-century stage of modern industrialized use and misuse of the natural environment. It is nonetheless crucial, for the purpose of the present essay, to emphasize that these remarks apply to the nineteenth century.

In earlier economic thought, up to the late eighteenth century, the emphasis was habitually on maximizing the utilization of natural resources. The problem, if there was one, was with under-, not over-exploitation, of nature. Furthermore, modern discussions of legal and economic considerations of the commons tend to concentrate on the precise mechanisms through which private versus public ownership and management of land affect the efficiency of its use. This distinction, before the nineteenth century, was less significant, at a time when landlords had a relatively free hand to deal with their lands in any manner they saw fit, whereas public policies regarding the use of natural resources were determined in a nondemocratic fashion. Any notion of a commons, in the modern sense, was practically irrelevant in this historical context. In fact, even today the term "commons" has yet to be precisely defined. In the past fifty years a broader, if imprecise, array of notions has been attached to the concept of the commons, not least among environmentally-oriented scholars, but also in popular nonacademic discourse.³ It is therefore important

2 See W. F. LLOYD, *TWO LECTURES ON THE CHECKS TO POPULATION* 30-33 (Oxford, J.H. Parker 1833). On Lloyd see Richard M. Romano, *William Forster Lloyd – a non-Ricardian?*, 9 *HIST. POL. ECON.* 412 (1977).

3 See John R. Wagner, *Water and the Commons Imaginary*, 53 *CURRENT ANTHROPOLOGY* 617 (2012).

to keep in mind a distinction between the precise use of the term “tragedy of the commons” which Hardin originally used, and this much broader (post-Hardinian) concept. In any case, investigating earlier discussions of the use of the commons (again, without the exact term itself), specifically in economic literature, reveals some aspects of this problem that are interesting from our more “tragic” modern viewpoint.

Perhaps the most obvious historical example of the management of natural resources was timber. The need to sustainably manage natural resources was particularly evident regarding forestry, since in the premodern world wood was the most vital natural resource, the veritable fuel of material life, and consequently the one most heavily managed (and mismanaged).⁴ By the late eighteenth century, despite growing recognition of the consequences of deforestation, European countries did not react with a comprehensive forestry management policy similar to Tokugawa Japan. Britain in particular reacted by moving before other countries to a coal-based economy.⁵ As Paul Warde has demonstrated in detail, early modern forest management was intimately connected to wider issues of social, economic and political developments.⁶ Karl Appuhn has claimed that the early modern Venetian concern with forestry was so pronounced that it even differed from the more predominant early modern mechanistic outlook on nature.⁷

Nevertheless, even as late as the eighteenth century, notions about forestry did not constitute sensitivity to the natural environment for its own sake. They were motivated by a concern for maintaining sufficient wood supplies for human consumption, and rarely because of aesthetic notions or environmental concerns in the modern sense. Moreover, conceptions regarding forest depletion were confined to local areas, and concern with the global-scale human effect

4 See the remarks in MICHAEL WILLIAMS, *DEFORESTING THE EARTH: FROM PREHISTORY TO GLOBAL CRISIS* 130-36, 145-49, 160-67, 179-209, 222-33, 265-75 (2003).

5 See JOHN F. RICHARDS, *THE UNENDING FRONTIER: AN ENVIRONMENTAL HISTORY OF THE EARLY MODERN WORLD* 11-12, 20, 22, 178-80, 183-87, 190-91, 221-41, 617-22 (2005). For an overview of early modern forest management in Japan, see CONRAD TOTMAN, *THE GREEN ARCHIPELAGO: FORESTRY IN PRE-INDUSTRIAL JAPAN* 1-6, 171-90 (1998).

6 See PAUL WARDE, *ECOLOGY, ECONOMY AND STATE FORMATION IN EARLY MODERN GERMANY* (2006). For eighteenth-century land management, see FREDRIK ALBRITTON JONSSON, *ENLIGHTENMENT’S FRONTIER: THE SCOTTISH HIGHLANDS AND THE ORIGINS OF ENVIRONMENTALISM* (2013).

7 See KARL APPUHN, *A FOREST ON THE SEA: ENVIRONMENTAL EXPERTISE IN RENAISSANCE VENICE* 1-19, 272-302 (2009).

on the environment was not an issue. For example, the famous naturalist Georges-Louis Leclerc, Comte de Buffon, wrote about forest management.⁸

Yet according to Buffon, however great the waste created by humans, the total quantity of life never diminished, and “reproduction was born of destruction” (“la reproduction naiss[e] de la destruction”).⁹ Like most of his contemporaries, he would probably have been surprised at modern notions of carrying capacity or overpopulation, at a time when populousness was commonly regarded as an indication of progress. Nevertheless, recent scholarship has presented a growing amount of evidence regarding rising early modern notions of what today would be termed sustainability, which became considerably pronounced by the eighteenth century.¹⁰ Regulation of industrial pollution also became a concern at the time.¹¹ It is therefore clear that by the eighteenth century, and probably much earlier, the human impact on the environment, if not its “tragic” aspect, was beginning to be recognized. Richard Grove has emphasized this recognition, and described the eighteenth-century Physiocratic reaction to it as a precursor to modern responsible long-term management of natural resources.¹² Nevertheless, he somewhat overstates this point. While these eighteenth century precedents to what today would be termed environmental consciousness were important, they were still both relatively rare and, more importantly, still part of, rather than a challenge to, the predominant eighteenth-century concern with maximizing the use of natural resources, not limiting it. This common emphasis on maximizing the use of natural resources, in what was often a totally uninhibited manner, seems more excusable regarding premodern figures than modern ones, although even regarding the latter we

8 See 31 GEORGES-LOUIS LECLERC COMTE DE BUFFON, *Memoire Sur la Conservation et le Rétablissement des Forêts* [*Memo on the Conservation and Restoration of Forests*], in HISTOIRE NATURELLE, GÉNÉRALE ET PARTICULIÈRE [NATURAL, GENERAL AND PARTICULAR HISTORY] [hereinafter HISTOIRE NATURELLE] 249-71 (Paris, Imprimerie Nationale 1775); GEORGES-LOUIS LECLERC COMTE DE BUFFON, *Sur la Culture & l'exploitation des Forêts* [*On the Culture & Exploitation of Forests*], in HISTOIRE NATURELLE at 271-90.

9 See GEORGES-LOUIS LECLERC COMTE DE BUFFON, *Les Animaux Carnassiers* [*The Carnivorous Animals*], in 7 HISTOIRE NATURELLE [NATURAL HISTORY] 3-4 (Paris, Imprimerie Nationale 1758).

10 See Paul Warde, *The Invention of Sustainability*, 8 MOD. INTELL. HIST. 153 (2011); Mark Stoll, “Sagacious” Bernard Palissy: Pinchot, Marsh, and the Connecticut Origins of American Conservation, 16 ENVTL. HIST. 4 (2011).

11 See, e.g., Pierre Claude Reynard, *Public Order and Privilege: Eighteenth-Century French Roots of Environmental Regulation*, 43 TECH. & CULTURE 1 (2002).

12 See RICHARD H. GROVE, GREEN IMPERIALISM: COLONIAL EXPANSION, TROPICAL ISLAND EDENS AND THE ORIGINS OF ENVIRONMENTALISM, 1600-1860, at 153-67 (1995).

should always remember that most of the benefits of modern life that we take for granted rely on the use of nature, a fact well-recognized by Hardin.

One famous early Enlightenment outlook, which was to have a lasting impression on the instrumental use of nature, was John Locke's discussion of nature in America in the fifth chapter of the *Second Treatise of Government*, the most famous and influential early argument for the labor theory of value. Locke was a mercantilist in his general economic outlook and, like other mercantilists, projected the empirical and rational outlook of the Scientific Revolution onto both theoretical and practical issues of economic policy. In Locke's view, it was the investment of labor into the cultivation of natural resources which made them economically valuable, consequently making them the objects of proprietary rights. Leaving nature in an uncultivated state was, according to this view, almost a sin. Human beings would only have an incentive to cultivate natural resources that would yield, beyond the produce they consumed themselves, a surplus with which they could barter for other products. The efficiency of this economic transaction would grow with the invention of money, but its essential foundation would remain the same. "Even amongst us, land that is left wholly to nature, that hath no improvement of pasturage, tillage, or planting, is called, as indeed it is, waste; and we shall find the benefit of it amount to little more than nothing." The more labor was utilized in cultivating nature, the better; hence also the larger the population, the better. "This shows how much numbers of men are to be preferred to largeness of dominions; and that the increase of lands, and the right of employing of them, is the great art of government."¹³

The key example Locke invoked here was America, and this was to prove an important part in supporting the nascent colonial enterprise. When he remarked that "in the beginning all the world was America," he meant just that: "in the beginning;" at the starting point of historical progress; the so-called state of nature, when human beings had only begun to cultivate their natural surroundings. The indigenous Americans were liberally provided by nature with everything necessary for material and cultural progress, "yet for want of improving it [nature] by labour, have not one hundredth part of the conveniences we enjoy: and a king of a large and fruitful territory there feeds, lodges, and is clad worse than a day-labourer in England."¹⁴ This viewpoint ultimately justified the colonial dispossession of the American Indians, since if they did not make proper use of their natural resources, they lost their claim to them. Locke's ideas on this topic were the most influential manifestation of

13 See JOHN LOCKE, *Of Property*, in TWO TREATISES OF GOVERNMENT 215, 231 (Thomas Hollis ed., London, A. Millar et al., 1764) (1689).

14 *Id.* at 362, 366.

the common early modern “agriculturalist argument” for possessing lands in the colonies, lands seemingly neglected by the natives. Based on the ancient Roman principle of *res nullius*, or the similar notion of *vacuum domicilium*, this argument claimed that “empty things,” primarily land, belonged to all mankind till they were made use of. Unused land was therefore open for possession, an underlying assumption of Locke’s claim for labor leading to proprietary possession.¹⁵ Obviously, this highly influential text was simply a particularly forceful expression of the common view of nature as a resource meant above all for human use, use which was to underline material and cultural progress. Any notion of a tragedy of the commons, of the idea that nature was finite and its use therefore needed to be regulated, was totally foreign to this outlook.

Before the modern era, the idea of limiting the use of nature to avoid a tragedy of the commons would have been deemed almost illogical. Even when arguments were made to limit the use of natural resources or public lands, they were made from different perspectives than modern tragedy-of-the-commons arguments. A good way of demonstrating this is to take a look at the rare — and they are indeed rare — instances when political economic discussions considered limiting the use of natural resources, not least to preserve them for recreational use. St. Thomas Aquinas recommended establishing cities in places that were pleasant for their natural beauty, since moderate enjoyment and pleasure were human necessities.¹⁶ By the Renaissance, however, a more instrumental outlook replaced such medieval notions. Giovanni Botero claimed that using land for parks rather than for agriculture was unprofitable and ill-advised, a fact which was proved by the complaints of the English people, who due to such a policy found themselves short of grain.¹⁷

The English debate about enclosures, which continued throughout the early modern era and well into the nineteenth century, played an important part in the formation of early notions of the use of the commons, as Lloyd’s example proves. An interesting example was the sixteenth-century early mercantilist John Hales. Hales wanted to encourage arable farming so that it would equal the use of land for pasture; like other mercantilists, this meant

15 See ANTHONY PAGDEN, *LORDS OF ALL THE WORLD: IDEOLOGIES OF EMPIRE IN SPAIN, BRITAIN AND FRANCE C. 1500-C. 1800* (1995); BARBARA ARNEIL, *JOHN LOCKE AND AMERICA: THE DEFENCE OF ENGLISH COLONIALISM* 79-80, 109-17, 141-45 (1996); Andrew Fitzmaurice, *The Genealogy of Terra Nullius*, 38 *AUSTL. HIST. STUD.* 1 (2007).

16 ST. THOMAS AQUINAS, *POLITICAL WRITINGS* 51-52 (R. W. Dyson ed. & trans., 2002).

17 GIOVANNI BOTERO, *THE REASON OF STATE & THE GREATNESS OF CITIES* 150 (P.J. Waley et al. trans., 1956) (1606).

for him a policy which was to be enacted through direct government action. Encouraging agriculture meant, in his opinion, limiting enclosures (though not abolishing them) and encouraging a freer market in grain.¹⁸ Hales' views were that enclosures would not have damaged people's livelihoods had the land been distributed among everyone, and each person would have cultivated his own land. However, he claimed, in reality enclosures were reserved for the few, they were enforced, and meant to turn arable land into pasture. In this situation, coupled with a growing population, most people were left unemployed, and poverty and the general dearth of the era were augmented. Ameliorating this situation required a duties policy making wool cheaper, and thus less profitable as an exportable commodity, or conversely, through tax policies, making corn more expensive and thus profitable as an exportable commodity.¹⁹ The damage to land cultivation resulting from unequal enclosures was ultimately harmful to society in general, since it disturbed the balance between the profitability of different occupations and different types of uses of land. Hales made various suggestions meant to ameliorate this situation, including recognizing the need to trade with foreign nations to obtain products which insufficiently existed in England, while maintaining the mercantilist emphasis on the positive balance of trade.²⁰ Underlying this whole approach was the assumption that England's land was first and foremost an economic resource meant to be used with maximal efficiency for the promotion of the nation's wellbeing and power. Any notion of the tragedy of the commons in the modern sense was totally foreign to this outlook. Subsequently, in the seventeenth century the mercantilist Thomas Mun would state this principle unequivocally, writing:

Would men haue vs to keepe our woods and goodly trees to looke vpon? they might as well forbid the working of our woolls, & sending forth our cloth to forraine parts; for both are meanes alike to procure the necessarie wares, which this Kingdome wanteth. Doe they not know that trees doe liue and grow; and being great, they haue a time to dye and rot, if oportunity make no better vse of them; and what more noble or profitable vse then goodly ships for Trade and warre? are they not our barns for wealth and plenty, seruing us walles and Bulwarkes for our peace and happinesse? Do not their yearely buildings maintaine

18 See JOHN HALES, *A DISCOURSE OF THE COMMON WEAL OF THIS REALM OF ENGLAND* (Elizabeth Lamond ed., 1971) (1581). It was probably written around 1548-1549, though published only in 1581. On Hales, see E. A. J. JOHNSON, *PREDECESSORS OF ADAM SMITH: THE GROWTH OF BRITISH ECONOMIC THOUGHT 19-37* (1965).

19 HALES, *supra* note 18, at 48-55.

20 *Id.* at 60-65.

many hundred poore people, and greatly increase the number of those Artesmen which are so needfull for this common wealth?²¹

In the eighteenth century this approach remained predominant. What has been termed the Agricultural Enlightenment also gave rise to an increasing emphasis on the notion that the aesthetic beauty of the landscape itself was tied to its cultivation — uncultivated land was, according to this type of perception, simply not as beautiful as land touched and ordered by productive human activity. In this way the Agricultural Enlightenment provided the intellectual underpinning for the subsequent Agricultural Revolution.²² Robert Wallace, a precursor of Malthus regarding the possibility of overpopulation, described the beauties and grandeur of nature enthusiastically. Yet he also detailed the human achievements in harnessing natural resources by applying knowledge and science.²³ Pierre Poivre, the main protagonist in Richard Grove's above-noted argument for the Physiocratic careful management of natural resources, was even more decisive. While praising Chinese agriculture, he approvingly noted how the Chinese had no use for immense parks where deer lived rather than people. Even the country houses of the rich in China were adorned with "useful cultures," in which "every where [sic] reigns a happy imitation of that beautiful disorder of nature, from whence art has borrowed all her charms."²⁴ Jacques Necker, a much more prominent public figure and policy-shaper, similarly claimed that land utilized for parks, decorative gardens, or other unproductive purposes would come at the expense of food production and enlarging the population.²⁵ Necker specifically criticized the consumption of luxuries as hindering the growth of population. Among such luxuries, he noted the excessive space allotted to the care of horses, and "those parks and sumptuous gardens that the ploughshare shall no longer furrow."²⁶ Similarly,

21 THOMAS MUN, *A DISCOURSE OF TRADE, FROM ENGLAND UNTO THE EAST-INDIES* (1621), *reprinted in* EARLY ENGLISH TRACTS ON COMMERCE 24-26 (J. R. McCulloch ed. 1970) (1856) (spelling as original).

22 See PETER M. JONES, *AGRICULTURAL ENLIGHTENMENT: KNOWLEDGE, TECHNOLOGY, AND NATURE, 1750–1840*, at 188-89 (2016).

23 See ROBERT WALLACE, *VARIOUS PROSPECTS OF MANKIND, NATURE, AND PROVIDENCE* 129-63 (Augustus M. Kelly 1969) (1761).

24 See PIERRE POIVRE, *TRAVELS OF A PHILOSOPHER: OR, OBSERVATIONS ON THE MANNERS AND ARTS OF VARIOUS NATIONS IN AFRICA AND ASIA* 151-52 (Gale Ecco 2010) (1770).

25 See JOSEPH J. SPENGLER, *FRENCH PREDECESSORS OF MALTHUS: A STUDY IN EIGHTEENTH-CENTURY WAGE AND POPULATION THEORY* 327 (1965).

26 1 JACQUES NECKER, *A TREATISE ON THE ADMINISTRATION OF THE FINANCES OF FRANCE* 218-19 (Thomas Mortimer trans., London, J. Walter 1785); 3 *id.* at 102.

according to Pietro Verri, one of Adam Smith's eighteenth-century precursors in establishing modern economic analysis, it was important not to waste land which might be used for agriculture, by using it instead for gardens, game forests, or other luxury uses which did not encourage economic growth.²⁷

This approach would predominate in the thought of Adam Smith and his continuators among the classical political economists. Smith himself noted that "Lands, for the purposes of pleasure and magnificence, parks, gardens, public walks, &c. possessions which are every where [sic] considered as causes of expence [sic], not as sources of revenue, seem to be the only lands which, in a great and civilized monarchy, ought to belong to the crown."²⁸ This was perhaps a slightly more moderate position, yet it still restricted the uneconomic use of land to the to royalty and members of the aristocracy, and did not recommend it as a general policy. For Smith, the agricultural use of land remained of paramount importance. Nevertheless, Hardin's blaming of Smith for responsibility, even if oblique, for the demographic aspect of the tragedy of the commons, because of Smith's advocacy for modern economic emphasis on self-interest, is outdated.²⁹ Recent scholarship, which to be fair was mostly published later than 1968, has repeatedly stressed the moral aspects of Smith's outlook and challenged his perception as the father of the modern notion of *homo economicus*.³⁰ The tendency to see him as the originator of the uninhibited advocacy of modern exploitation of nature is therefore as misguided as the equally unhistorical tendency to regard Malthus as a precursor of modern environmentalism.³¹

Among Smith's classical continuators, Jean-Baptiste Say, in an atypical passage, expressed rare recognition of the positive influence of beautiful nature. Yet even this was beauty created by human cultivation, not pristine nature, as Say noted the advantages of cultivated public spaces, where people

27 See PIETRO VERRI, REFLECTIONS ON POLITICAL ECONOMY 77-79 (Barbara McGilvray & Peter D. Groenewegen trans., Peter D. Groenewegen ed., 1993).

28 See 2 ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 824 (Roy H. Campbell et al. eds., Oxford Univ. Press 1976) (1776).

29 See Hardin, *supra* note 1.

30 For only a few examples, see CHARLES L. GRISWOLD, ADAM SMITH AND THE VIRTUES OF ENLIGHTENMENT (1999); EMMA ROTHSCHILD, ECONOMIC SENTIMENTS: ADAM SMITH, CONDORCET, AND THE ENLIGHTENMENT (2001); D. D. RAPHAEL, THE IMPARTIAL SPECTATOR: ADAM SMITH'S MORAL PHILOSOPHY (2006); JACK RUSSELL WEINSTEIN, ADAM SMITH'S PLURALISM: RATIONALITY, EDUCATION, AND THE MORAL SENTIMENTS (2013).

31 See, e.g., Richard A. Smith, *The Eco-Suicidal Economics of Adam Smith*, 18 CAPITALISM NAT. SOCIALISM 22 (2007); David Wells, *Resurrecting the Dismal Parson: Malthus, Ecology, and Political Thought*, 30 POL. STUD. 1 (1982).

could enjoy healthy exercise, watch pleasant landscapes and breathe clean air.³² Malthus, not usually a romantic sentimentalist, repeatedly in his travel diaries expressed appreciation of the beauty of natural scenery.³³ But in his official publications such notions almost never appeared, suggesting that for Malthus they did not belong to economic analysis or public-policy determination. It should also be emphasized that contrary to some interpretations, Malthus did not regard overpopulation as an imminent problem either in the British realm, let alone the global one. For him, the notion of a tangible finiteness to natural resources which would materialize in full force was more a theoretical notion projected into the future to moderate contemporary *socially problematic*, not environmentally problematic, overpopulation. The modern crisis in the sense implied by Hardin's tragedy of the commons was not part of Malthus's purview.

The most interesting discussion of this issue among the nineteenth-century classical political economists was, however, presented by John Stuart Mill. Mill defined property not only as what was produced by human beings. The earth itself, the forests and the waters, were the inheritance of humanity, and there was need for regulating the common enjoyment of these riches, regulation which was among the necessary tasks of government.³⁴ Mill's *Principles of Political Economy*, the most substantial publication in the field since Smith's *Wealth of Nations*, throughout its many hundreds of pages gave repeated attention to this regulation, but in the traditional sense of outlining the proper policies for advancing the cultivation of land and other natural resources and making them more economically efficient and productive. Surprisingly, however, it was in the midst of this text that Mill suddenly adopted a very different perspective when he wrote:

A population may be too crowded, though all be amply supplied with food and raiment. It is not good for man to be kept perforce at all times in the presence of his species. A world from which solitude is extirpated, is a very poor ideal. Solitude, in the sense of being often alone, is essential to any depth of meditation or of character; and solitude in the presence of natural beauty and grandeur, is the cradle of thoughts and aspirations which are not only good for the individual,

32 See JEAN-BAPTISTE SAY, A TREATISE ON POLITICAL ECONOMY, OR THE PRODUCTION, DISTRIBUTION AND CONSUMPTION OF WEALTH 442 (Charles R. Prinsep & Clement C. Biddle trans., Augustus M. Kelley Publishers 1971) (1880).

33 See THOMAS R. MALTHUS, THE TRAVEL DIARIES OF THOMAS ROBERT MALTHUS 45, 65, 68, 70-71, 77, 88, 93, 96, 109-10, 124-28, 133-34, 138, 263-64 (1966).

34 See 2 JOHN STUART MILL, PRINCIPLES OF POLITICAL ECONOMY, WITH SOME OF THEIR APPLICATIONS TO SOCIAL PHILOSOPHY 801 (John M. Robson & Vincent W. Bladen eds., 1965) (1848).

but which society could ill do without. Nor is there much satisfaction in contemplating the world with nothing left to the spontaneous activity of nature; with every rood³⁵ of land brought into cultivation, which is capable of growing food for human beings; every flowery waste or natural pasture ploughed up, all quadrupeds or birds which are not domesticated for man's use exterminated as his rivals for food, every hedgerow or superfluous tree rooted out, and scarcely a place left where a wild shrub or flower could grow without being eradicated as a weed in the name of improved agriculture. If the earth must lose that great portion of its pleasantness which it owes to things that the unlimited increase of wealth and population would extirpate from it, for the mere purpose of enabling it to support a larger, but not a better or a happier population, I sincerely hope, for the sake of posterity, that they will be content to be stationary, long before necessity compels them to it.³⁶

Here was a clear precedent to Hardin's notion of a tragedy of the commons. Even if slightly later than W. F. Lloyd, Mill was a much more prominent and influential figure among political economists, and in contemporary intellectual life in general. Yet it is highly indicative that both before and after this passage the text of *Principles of Political Economy* adhered to the more common viewpoint. It seems that Mill recognized the environmental price of industrialization, but regarded it as a lamentable yet unavoidably necessary price for the material and social advancement of the human race. We should remember, however, that Smith, Mill, and even Malthus, did not yet face the environmental realities of the modern age, and regarded any *tangible* danger of depletion of natural resources on a global scale only as a theoretical, not imminent, possibility.

A truly modern notion of the commons in the nineteenth century was eventually outlined not by Lloyd or Mill, but by one of the fathers of neoclassical economics, and hence in the vein which would subsequently predominate modern economic analysis. This was William Stanley Jevons in his 1865 book *The Coal Question*. Jevons did not evoke the precise terminology of the

35 A British unit equal to a quarter of an acre.

36 MILL, *supra* note 34, at 756. For relevant discussions, see JERRY EVENSKY, ADAM SMITH'S MORAL PHILOSOPHY: A HISTORICAL AND CONTEMPORARY PERSPECTIVE ON MARKETS, LAW, ETHICS, AND CULTURE 308-12 (2005); John Parham, *What is (Ecological) 'Nature'? John Stuart Mill and the Victorian Perspective*, in CULTURE, CREATIVITY AND ENVIRONMENT: NEW ENVIRONMENTALIST CRITICISM 37 (Fiona Becket & Terry Gifford eds., 2007); Martin O'Connor, *John Stuart Mill's Utilitarianism and the Social Ethics of Sustainable Development*, 4 EUR. J. HIST. ECON. THOUGHT 478 (1997).

commons, let alone in the tragic sense. But he did present a detailed scientific analysis of the policy measures necessary to address in advance the possible depletion of Britain's coal reserves, which were so clearly vital by that stage of the Industrial Revolution. Jevons considered the complete physical exhaustion of Britain's coal-mines an impossibility. The idea of exhaustion of coal was an economic one, and he worried over the growing difficulty and cost of extracting coal from increasingly deeper mines, which endangered British international supremacy. Despite its incomparable utilization of coal, other countries were also advancing in this field. The stationary state had not yet been reached, but it loomed threateningly in the imminent future. Britain's reliance on coal was essentially a two-edged sword — on the one hand it was the engine which fueled its astonishing progress, yet on the other it created a dependence which threatened prosperity and population. The quality of the country's population and its ability to continue progressing through scientific and technological advances were not in question. Only its material resources were limited. Other countries, however, were also capable of enhancing their utilization of natural resources. It was therefore precisely at the point of Britain's supremacy, in Jevon's present, that the opportunity emerged for taking the necessary public-policy steps which would be both impossible and sorely needed in the bleaker future.³⁷

At the heart of Jevons' approach was the idea of maximizing the efficiency of resource utilization. Human technology aimed at harnessing energy as a motive power, and in this respect Jevons considered coal the best source of power that nature afforded to human command, specifically in fueling steam-engines. With further scientific progress, reliance on coal was only likely to increase. This emphasized the importance of coal deposits, since supposing some other sources of fuel would be discovered in the future, there was no certainty that Britain would have superior reserves of such putative resources.³⁸ On a more optimistic note, Jevons emphasized how future technological possibilities might enable a more efficient energy extraction from coal. "No *à priori* reason here presents itself why each generation should not use its resource of knowledge and material possessions to make as large a proportional advance [in utilizing coal] as did a preceding generation." Yet this optimism was conditional and temporary, since in contrast with land, which could continue yielding agricultural produce indefinitely, coal deposits were limited.

37 See WILLIAM STANLEY JEVONS, *THE COAL QUESTION; AN INQUIRY CONCERNING THE PROGRESS OF THE NATION, AND THE PROBABLE EXHAUSTION OF OUR COAL-MINES*, at v-xxvi (London, Macmillan 1866).

38 *Id.* at 164-68.

For once it would seem as if in fuel, as the source of universal power, we had found an unlimited means of multiplying our command over nature. But alas no! The coal is itself limited in quantity; not absolutely, as regards us, but so that each year we gain our supplies with some increase of difficulty.

Decreasing returns to labor, as it applied to gaining utility from coal, were in effect a physical limit to its available quantity. Ultimately, this limit could not be avoided. Therefore, the advisable thing to do for the benefit of Britain's future was not to continue enhancing the consumption of coal, but rather to scale it back precisely at the present point when it was in abundance.³⁹ In the modern sense, Jevons, however, was an environmental rather than an ecological economist (a difference which we will address in a moment). He recognized a basic problem regarding the use of natural resources — the relation between the available quantity of raw material and the amount of its consumption. In an efficiently-functioning economy based on proper policy, the ratio between these two could be controlled, at least to a certain extent. Furthermore, Jevons realized that increasing the efficiency of resource utilization did not decrease consumption, but in fact increased it. Scholars have termed this “Jevons’s paradox,” or the “rebound effect.”⁴⁰

All of this might make us expect to regard Jevons as a precursor of contemporary angst regarding the tragedy of the commons. But in fact he was much more optimistic. The problem of coal production and consumption was enhanced by growing population, yet Jevons was much more sanguine than Malthus had been, let alone how subsequent economists and environmentalists would be. Relative to its resources, Britain was in fact underpopulated, though Jevons did not claim that it would always remain so.⁴¹ He regarded all aspects of culture, including the economic, to be inscrutably interdependent. The law of unintended consequences meant that no attempt to further a specific cause would necessarily lead to its proclaimed goal rather than a different goal, no less beneficial. The choice facing Britain was between decelerating its present consumption and prosperity, or else disregarding its future, with no promise of success either way (particularly in the former case). This was ultimately a choice between “brief greatness and longer continued mediocrity.” But for Jevons, in fact, there was no choice here, and on this point he proved himself quite different from subsequent modern views regarding the tragedy of the

39 *Id.* at 169-78.

40 See Antoine Missemer, *William Stanley Jevons’ The Coal Question (1865), Beyond the Rebound Effect*, 82 *ECOLOGICAL ECON.* 97 (2012); Blake Alcott, *Jevons’ Paradox*, 54 *ECOLOGICAL ECON.* 9 (2005).

41 JEVONS, *supra* note 37, at 196-98, 204-05.

commons. Not only, in his opinion, was it ill-advised to relinquish Britain's cultural superiority, it was also a merely counterfactual exercise, since the actions of past ages had set it on a path to greatness. He was convinced that even were Britain eventually to recede into mediocrity, it will already have made a singular contribution to the overall progress of humanity, a contribution based not least on the efficient utilization of natural resources.

In our contributions to the arts... we have unintentionally done a work that will endure for ever. In whatever part of the world fuel exists, whether wood, or peat, or coal, we have rendered it the possible basis of a new civilization. In the ancient mythology, fire was a stolen gift from heaven, but it is our countrymen who have shown the powers of fire, and conferred a second Promethean gift upon the world.⁴²

Jevons's outlook makes clear that one of the main things that differentiate the idea of the commons in its nineteenth-century and earlier sense from the subsequent modern conception is the notion of what exactly the government's role in managing the natural resources of the commons is. In our post-Hardinian era this means that the commons need to be managed by the state, or, to be more precise, by state regulation based on democratic policymaking. Today this alludes to the attempt to save the commons, whether this means enhancing the sustainable use of natural resources, or the preservation of "pristine nature." However, in the early modern era, and up to the late nineteenth century, this meant mainly the former of these aims, but again, without the idea that there was a tangibly imminent chance that they would be consumed completely. In other words, the tragic aspect of the use of the commons became a reality only in the twentieth century. Before that, it was a question of efficiency, not tragedy, even in the premodern world where actual hunger was more prevalent in Europe than in modern times.

It should be clear by now that the idea of the tragedy of the commons in its full modern scientific and economic sense therefore emerged from the realities of the twentieth century. Our discussion of the prehistory of this idea, if we may name it as such, has however interesting manifestations vis-à-vis the economic debate of our own time. Particularly interesting is the difference between environmental economics and ecological economics. The former entails the mainstream of economic thought, with its emphasis on the maximization of the efficient utilization of natural resources, while the latter denotes those economists, usually outside the mainstream of the professional discourse, who insist on the inclusion of environmental and conservational issues, and naturally also the concept of the tragedy of the

42 *Id.* at 374.

commons, in economic debates. Kenneth Boulding's "spaceship earth" is a famous and influential example of this latter approach, actually predating Hardin's *Tragedy of the Commons* by several years.⁴³

The difference between these two approaches is mirrored in the difference between the notions of, respectively, weak and strong sustainability. Weak sustainability is the approach claiming that a natural resource might be utilized to exhaustion, so long as sufficient investment in commensurable resources or capital is made, so that future generations will have at their disposal complementary natural resources. According to this approach, fossil fuels, for example, might be used to exhaustion so long as other types of energy technologies are developed in their stead. Strong sustainability, on the other hand, claims that some natural resources are incommensurable, and therefore cannot be replaced by other resources or capital. The singular qualities of a devastated landscape, for example, are lost forever, and no compensation is possible which would answer the requirement for intergenerational justice. The tragedy of the commons, needless to say, is an inherent component of the outlook of strong sustainability. But it should be noted that the lines between environmental and ecological economics, and between weak and strong sustainability, are not always black and white. The differences between them are often dramatic, yet all but the most extreme ecologists recognize the basic need for economic use of nature, while all but the most extreme environmental economists recognize the incommensurable quality of certain natural resources such as rare animals and pristine landscapes. Even Robert Solow, one of the fathers of the weak sustainability approach, has noted that "The preservation of natural beauty is a different matter since that is more a question of direct consumption than of instrumental productive capacity."⁴⁴

The tragedy of the commons, therefore, is a modern concept, because it answers to a modern environmental and economic reality, one which was not even imaginable in the preindustrial age, and which was only recognized as a distant future danger, almost an intangible one, in the early industrial age of the nineteenth century. The general idea of a commons, if not the term itself, began emerging earlier, but it lacked any "tragic" component precisely because the urgency of the problem was not apparent. Furthermore, before the emergence of modern democracy the idea of a public policy regarding management of the commons, let alone a public debate about this policy, was irrelevant. Hardin himself, using Lloyd's original example of cattle grazing,

43 See Kenneth E. Boulding, *The Economics of the Coming Spaceship Earth*, in ENVIRONMENTAL QUALITY IN A GROWING ECONOMY 3-14 (Henry Jarrett ed., 1965).

44 See Robert M. Solow, *On the Intergenerational Allocation of Natural Resources*, 88 SCANDINAVIAN J. ECON. 141, 142 (1986).

recognized that a seemingly irresponsible use of the commons could continue for centuries because natural factors would limit its effects, but would become an acute problem once social and technological progress made overgrazing possible. “Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the common remorselessly generates tragedy.”⁴⁵ Hardin’s analysis is therefore premised precisely on the recognition of the effects of industrialization on the environment by way of making overuse of natural resources not just a possibility, but a reality which was increasingly evident and ubiquitous. This was a modern reality by its very definition, and while its early effects were already becoming gradually apparent in the nineteenth century, for example in Jevons’s analysis of coal use, a true recognition of these consequences only truly emerged in the late twentieth century. It was as if an inherent cultural optimism refused to consider these effects as truly cogent and ineluctable, even a century and a half after Malthus famously pointed the way to at least the *theoretical* possibility of overuse of natural resources. Even for Mill and Jevons, the idea that one day humanity would hit an insuperable limit to the earth’s carrying capacity was a possible tragedy in only a fictional sense. Many economists today cling to this belief. Whether their optimism is justified or not only the future will say.

45 Hardin, *supra* note 1.