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**The Establishment and Development of
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1. Preface

In this paper we try to make clear that the original utilitarian economic thought of J. S. Mill, which was like a headwater, ran to Cambridge University, after which his followers could tackle environmental problems of their days from an economic point of view (1).

First of all we refer to the utilitarian background of Mill's theoretical suggestions in his Political Economy and his political activities in the Commons Preservation Society (CPS) and the Land Tenure Reform Association (LTRA) (section 2). Next we introduce two of Mill's disciples of Cambridge insiders, the economist Fawcett and the moral philosopher Sidgwick, and discuss their theoretical and practical succession to Mill's thought (section 3). Likewise two Cambridge outsiders, the critic Ruskin and the economic theorist Jevons, criticized Mill's orthodoxy and influenced new Cambridge insiders. We describe these two outsiders (section 4) and identify one insider, Marshall, who established the foundation of today's Environmental Economics (section 5). Then we mention his disciple, another insider, Pigou, who developed this study (section 6). Lastly, we discuss methodological criticism of Cambridge Environmental Economic Thought (CEET) and suggest other streams to establish and develop Environmental Economics (section 7).

2. Mill's theory and practice of nature preservation: A fount of CEET

2.1. Contribution to Environmental Economic Thought (EET)

We may regard J. S. Mill (1806-1873) as a fount of the EET held by the early Cambridge school of Economics and as a source of recent Environmental or Ecological Economics (2). Justification of

this claim is as follows; Since Adam Smith economists always valued man-made-nature and praised its beauty while they could not evaluate wilderness, waste or commons. They scarcely find non-agricultural, cultural, or spiritual values of these natural things positive (3). As a last runner of the Classical Economists, Mill encountered the rapid loss of wild fauna and flora or biodiversity caused by the loss of commons, accompanied by the continuing enclosure. He also saw the growing difficulties of the rural poor and peasants who gathered many kinds of wild food and fuel from commons and fed their livestock on it.

Young Mill was very anxious not only about these rural problems, but also about the living conditions of poor labourers in many cities in the U.K. Contemplating these severe social problems, he became sceptical of the prevailing Benthamite utilitarianism that advocated the greatest happiness of the greatest number. In his Autobiography, Mill described his late 20s as the period of crisis of his mental history (Mill, 1981, pp.137-191). At length he had established his own utilitarianism and then overcome this crisis by himself. Of his Utilitarianism 1861, he wrote that “the happiness which forms the utilitarian standard of what is right in conduct, is not the agent’s own happiness, but that of all concerned. As between his own happiness and that of others, utilitarianism requires him to be strictly impartial as a disinterested and benevolent spectator” (Mill, 1869, p. 218). Mill’s utilitarianism may be characterized by its tendency to take care of others interests as equal to or prior to self-interest. Smith’s “sympathy”, which he thought of as the basis of civil society, came to be deeply reflected in establishing Mill’s other-oriented utilitarianism. The fields of governmental policy in Mill’s economic theory were extended beyond those of Smith. As we see in the following, Mill’s original Land-Environment Ethics (L-EE) and his Economics of the Stationary State (SS) were also based on his utilitarian philosophy, which simultaneously established his theory of nature preservation and urged his political practice of it.

Together with Mill’s philosophy, ethics and economics, the early professors of Cambridge and some founders of the National Trust developed his theory and practice to preserve commons. Mill influenced Henry Fawcett, the first professor of Political Economy at Cambridge, theoretically and politically. By contrast, Mill’s influence on Henry Sidgwick, the professor of Moral Philosophy, was largely theoretical.

2.2. Concept of “Natural Riches” and his justification of governmental intervention

In the preliminary remarks of his main work, Principles of the Political Economy (PPE), Mill conceives money as wealth. He also regards all things that nature does not give us for nothing or

over which we have any purchasing power as wealth too. Thus he could not see air as wealth. Besides, he mentions water together with land and forest in the first chapter of the closing part of PPE. He claims that the role of government is precisely to define and protect property rights and that the domain of governmental policy contained not only products of human labour, i.e. wealth, but also natural properties. He asks, “[I]s there nothing recognized as properties except what has been produced?”(ibid., 1965, p.801) He asks again, “Is there not earth itself, its forest and waters, and all other natural riches, above and below the surface?”(ibid.) These were of course rhetorical questions. He then calls these “Natural Riches” as the “inheritance of the human race”. In other words he included various natural common goods in his original concept of “Natural Riches” that labour cannot create. He states that there has to be regulation for the common enjoyment of this natural heritage. He insists, “what rights and under what conditions, a person shall be allowed to exercise over any portion of this common inheritance, cannot be left undecided” (ibid.). For Mill the function of government is to determine regulations for possession and use of “Natural Riches”. Eventually government of his assumption is obliged decisively to intervene in the process of allocating and securing any rights to possess and use them appropriately. This obligation implies nationalization of some forms of natural heritage or prioritisation of their national procurement as needed.

2.3. Land-Environment Ethics and Economics of the Stationary State

Proceeding to discussion of governmental functions mentioned above, Mill argues that landlords should hold some ethics from the point of view of Mill’s utilitarianism in his PPE. Pointing out the need for some restriction of property rights, he insists that property in land can be justified in so far as landlords are improvers from the economic point of view (ibid. p.228). He also considers that the appropriation of land is “wholly a question of general expediency”, because land is not the product of human labour, but “the original inheritance of the whole species” (ibid.p.230). According to Mill, when private property in land is not “expedient”, “it is unjust” (ibid.). Landowners should be aware that their appropriation is allowed by their society and the implicit condition of this allowance is that it should not interfere with the public good. He claims that property rights for cultivation do not automatically exclude a neighbour’s access rights or rights of way, provided the loss of land produce can be prevented and the privacy of landlords protected. He regards landlords’ restriction of neighbours’ access rights to conserve wild animals and birds as game, as an abuse of their

property rights (4). We may recognize this as Mill's original Land Ethics based on his utilitarianism (5).

In the following section of PPE, entitled "Of the SS", Mill again demonstrates his Land Ethics as having a close relation to the process of economic development. He states that, given an increasing population and their needs for crops, non-cultivated land i.e. commons are enclosed to provide arable land for cultivations. Enclosure implied the destruction and loss of commons, where wild animals and plants grew, the poor neighbours and peasants gathered their food, fuel, and fodder, and enjoyed free open space. Mill's Land Ethics had developed and provided the original Environmental Ethics. It insisted on the need to preserve commons by evaluating the opportunity cost of natural habitat and open spaces for recreation or by calculating expected losses of them.

Realization of his Environmental Ethics required the end of enclosure, accelerated by economic growth and meant simultaneously the need to stop population growth accelerated by capital accumulation. As did his predecessors in Economics, Mill considered that economic growth and the accompanying population growth involved the cultivation of marginal arable land, where no one could gain more output than their input of capital and labour, nor secure any economic surplus. With these limitations on economic development, population growth and the expansion of arable land had to be stopped and afterwards reproduction on the same scale and cycle had annually to continue, even ignoring any innovation. This is Mill's SS.

In his view, not only had wild flora and fauna already become scarce, but the "natural beauty and grandeur" and "great portion of its pleasantness" which the earth provides us had gradually to be lost (ibid. p.756). To avoid such ruin, we would need to establish a more just distribution and redistribution system until arriving at the SS. We should control the increasing population and expanding arable land by voluntarily realizing the SS. We shall then be ready to create conditions for our survival and development of a civilized culture. From these descriptions, we glimpse Mill as a naturalist, who wrote many articles on wild plants from 1840s to early 1860s and was in close association with the biologist J.H. Fabre.

Mill's Environmental Ethics never insisted on animal rights nor praised the preservation of ecosystem in itself (6). He appreciated cultural and mental values of the earth and their flora and fauna provided for human life from his original utilitarian standpoint internalising respect for the others' interests.

2.4. Participation in the Commons Preservation Society and the Land Tenure Reform Association

Mill's participation in the CPS in his later life has been examined (7). In 1865, when Mill was elected MP, the former Speaker of the House of Commons, Shaw-Lefevre, invited Mill to chairmanship of the CPS, then in preparation. In the 1830's Shaw-Lefevre had been an advocate of Corn Laws abolition, and proposed the preservation of wasteland in urban districts not as arable land but recreational space for the public in those days. Though Mill declined to be chairman of the Society, he participated, with 9 lawyers, as an executive.

This Society was formally established through a public gathering in January 1866. Mill missed this convention but attended almost all meetings of the Society and advised other members on important matters. His contribution relied on his anti-enclosure reasoning, based on his own L-EE mentioned above. The lawyer members and Henry Fawcett, who was a close follower of Mill, covered legislating process of Commons preservation Bills. Mill was busy as a MP campaigning for woman's suffrage and the human rights of colonial people. He lost his seat in 1868. He then in 1869, started to organize the LTRA, to overturn the old and inequitable domination of the countryside by landlords, to resolve commons preservation problems. He was elected chairman of the preparatory board of the Association through a public gathering for the establishment of the Association in 1871. The purposes of the Association and Mill's explanation of it are explicit in its program.

The first, second and third articles of the program urged removal of feudal conventions restricting free transfer of lands. The fourth provided for governmental interception by taxation and stated a claim on the future unearned increase of the rent from land. The fifth and sixth articles promoted policies for cooperative agriculture and small cultivation. The aim of the seventh was to improve the quality of working class dwellings. Article eight to ten furnished detailed definitions of commons preservation. In the ninth, the Association insisted that "the less fertile portions, especially those which are within reach of populous districts, shall be retained in a state of wild beauty, for the general enjoyment of the community and encouragement in all classes of rural tastes of the higher order of pleasures also in order to leave to future generations the decision of their ultimate uses" (Mill, 1967, p.695). This was the central concern of the CPS. Article ten claimed "[t]o obtain for the State the power to take possession (with a view to their preservation) of all natural objects on artificial construction, artistic interest, together with so much of the surrounding land as may be thought necessary"(ibid.). This would become the aim of the National Trust, a successor to the Association.

Mill declared at the public meeting of the Association, just before his death in 1873 that “[w]e demand, not fewer enclosures or larger reservations, but no more enclosure at all, unless for the benefit of the people” (Mill, 1988, p.421).

3. Cambridge inside successors to Mill’s thought and political activities

3.1. Fawcett’s argument for commons preservation and allotment

Henry Fawcett (1837-1884) was elected Liberal Party MP in 1864. He is famous for the establishment of the English parcel post, the post savings and postal order systems during his tenure as Postmaster General of William Gladstone’s administration, but not as a preservationist.

Fawcett’s Political Economy has long been regarded as a mere adaptation of Mill’s texts and his contributions to the movement of commons preservation forgotten. In his day he became famous for his campaigning and lobbying as an early member of the CPS with Mill and the liberal lawyers mentioned above. Fawcett’s contribution to the Society was detailed in his biography in some 50 pages written soon after his death (Stephan, 1885). Rather here we focus on his theoretical contributions to the agenda of commons preservation problems in his economic text, which have scarcely been mentioned.

His first edition of Manual of Political Economy (MPE) 1863 contains no description of commons and their importance to the society. Stephan’s biography explains that there were some concerns of Fawcett about commons definitely in his transcripts of lectures for the Autumn term at Cambridge (ibid., p.294). It mentioned that Fawcett had pointed out some serious consequences of enclosure and detailed their scope and extent. Cottagers became impeded by loss of commons for feeding much of their livestock and their children lost the use of free and open space as playground. He mentioned that in general in the case of enclosure the poor in villages could not receive any compensation from landlords because the compensation happened to be done only for the land owning or leasing people. But those compensated did not redistribute these payments to their employees such as cottagers.

Afterwards we encounter Fawcett’s clear description of commons preservation and the need to stop enclosure in the third edition of MPE 1869, which reflected his experience of the activities of the CPS and the campaigns in Parliament. In this edition the chapter entitled “Remedies for the Low-wages” in the previous editions had been changed and titled “National Education and other Remedies for Law Wages”.

In this edition Fawcett pointed out first of all the benefits to town labourers of allotment gardens, usually attached to commons after the Enclosure Act of 1845, not only in getting fresh food, but also in good health and healthy leisure opportunity. He further insisted that enclosure of commons necessarily caused greater poverty to many poor peasants and denied recreation spaces to labourers living in urban districts. He describes, “such public lands as commons must each year become of more value and importance to the whole community” (Fawcett, 1869, p.224).

The National Trust, established in 1895, may be regarded as successors to Fawcett’s and Mill’s thought of commons preservation and is one of the largest conservation bodies in the world today. We may infer the influence of Fawcett’s MPE reached not only to his students and many intellectuals, but also indirectly to the nation, because this book went through eight editions (1907) after his death. His biography makes clear that he had plans to establish organisations to preserve forests as parks and others to conserve rivers.

3.2. Sidgwick’s attitude towards governmental intervention was deduced from the divergence of public and private interest

Henry Sidgwick (1838-1900) was an author of *The Method of Ethics* 1874, which explained his own utilitarian philosophy and ethics influenced by Mill’s. And he also lectured in Political Economy and published *The Principles of Political Economy* (PPE) 1883 and further *The Elements of Politics* 1891.

Recently there have been some influential studies on Sidgwick’s utilitarianism compared to Mill’s. And Hishiyama (1990, p.89), a Japanese economist, paid attention to Sidgwick’s references to “the divergence between private and social interest” in his PPE and regarded it as a source of A. C. Pigou’s references to “the divergence between marginal social net product (MSNP) and marginal private net product (MPNP)” in his *Economics of Welfare* (EW) 1920, which became important analytical tools of today’s Environmental Economics. Sidgwick paraphrased this divergence as “the conflict between private and social interest”. Alfred Marshall, as see below, applied Sidgwick’s concept to his own analysis of the degrading of amenity by building and rebuilding in cities in his day. Marshall was a successor to Sidgwick’s frame of reference and characterized these cases of “divergence” as an “ethico-economic problem” in his *Principles of Economics* (PE) published in 1890. Here we examine Sidgwick’s cases of divergence and his approval of governmental intervention in economy deduced from them.

Sidgwick explains the divergence in the chapter on “The system of natural liberty considered in relation to Production” in the section entitled “The Art of Political Economy” in PPE. He states, “in a society composed – solely or mainly – of “economic men”, the system of natural liberty would have, in certain respect and under certain conditions, no tendency to realize the beneficent results claimed for it” (Sidgwick, 1996, pp.402-403). He analyses cases in which private interest cannot accord with social interest, e.g. the maladies of monopoly and the inconsistency of interests between present and future generations. He argues that a well-placed lighthouse may permit free navigation of many ships and that conservation of forests may be “economically advantageous to a nation” by moderating and equalizing rainfall, but private enterprises would not do so because of the disadvantages to of doing so (ibid., 1901, pp.406-407). He insists that we need governmental intervention, as a laissez-faire policy cannot operate reasonably. In this point we may acknowledge that he follows Mill’s approval for the necessity of governmental control over the possession and use of the “Natural Riches”. He also refers to the maladies of governmental interference by citing some side effects. He points out, e.g. the danger of expanding the power and influence of government over society, together with the financial burdens of taxation and the outbreak of the civil resistance to government. He states that especially when such interference takes the form of control over certain manufacturers, certain landlords or certain classes of labourers, government has to be more accountable for their economic and political influences (ibid, p.414). Here we recognize his cautious attitude towards governmental intervention. His examples of lighthouse and forest conservation were adapted by Pigou when explaining “the divergence between MPNP and MSNP”. Sidgwick actually requested the registration and observation of the prohibition of fishing and shooting during the breeding seasons (Sidgwick, 1883, p.483) and Pigou also picked up this case as an example of his “divergence” in EW. While Mill had already pointed out needs to conserve fish resources in rivers in his PPE (Mill, 1965, p.30). We may regard Sidgwick as a successor in defending Mill’s claims for natural conservation in general that can be seen in his theory of the SS.

4. Cambridge Outsiders’ criticism of Mill’s Economics and their suggestions for Environmental Economics

4.1. Ruskin’s critique of Economics and his attention to pollution problems

John Ruskin (1819-1899) was and is famous for his art criticism, but less so for his social and economic criticism. This shift of target disappointed many of his readers. In general, his thought

followed the humanism and critique of economics of Thomas Carlyle, an old friend of Mill, whose reference to Economics as “a dismal science” is widely cited today. Ruskin’s critique of Economics was intended not only to accuse it of responsibility for the poverty and the decay caused by espousal of laissez faire doctrine, but also to advocate his theory of intrinsic value by criticising previous value theory of the Classical Economists including Mill. Here we try to outline his theory and examine how he could refer to the water and air pollution problems of his day on his own theory of value, which was beyond Mill’s simple attentions to the need for natural preservation.

Ruskin’s *Munera Pulveris* 1872, subtitled *Six Essays on The Elements of Political Economy*, was woven from his previous articles criticising this science. Here he defined “wealth” as consisting of “things essentially valuable” and “[v]alue signifies the strength, or availing of anything towards the sustaining of life” (*Munera Pulveris*, p.9-10). He thought this availing had dual features: e.g. intrinsic and effectual value. According to his explanations, “Intrinsic value is the absolute power of anything to support life” and the production of effectual value “always involves two needs, first, the production of things essentially useful then the production of the capacity to use it” (*ibid.* p.10). He cites as examples of his intrinsic value the power of wheat to sustain life, the power of air to keep our heat, and the beauty of flowers to cheer us. Concerning his effectual value, he paid attention to the personal and subjective side of our usage of things objectively having intrinsic value. We may understand his value theory to be characterized by his effectual value that introduces aesthetic and ethical judgments to human evaluation of things. Ruskin regarded air, water and land as wealth, saw humanity and its health as wealth, because he established his utility theory of value from a viewpoint of consumers or demand side of the economy.

Ruskin was an avid reader of J. S. Mill but he could not be satisfied with Mill’s value theory. We may recognize that Ruskin thought Mill’s value theory was still so much influenced by Ricardo’s labour theory of value that Mill’s concept of wealth had to exclude his “Natural Riches” such as air and water from the objects of his PPE but pertaining to the objects of law and politics.

In *Munera Pulveris*, Ruskin repeatedly insisted on the needs to restrain wealth by controlling unequal distribution legally and ethically, since the stronger preyed upon the weaker by free competition. We may note that this was the key point of Mill’s theory of governmental intervention in his *Principles*. But Ruskin pays attention to more important cases where we have to restrict the possession of natural things to avoid wasting land, poisoning streams and making air unwholesome (*ibid.* p.121). He points out the problems of exploitative cultivation, water contamination and the air pollution that Mill could not recognise in his day. We may conclude he was somewhat beyond

Mill's theory of commons preservation, limited to modifying the maladies of free private land possession only, based on his L-EE.

Before the publication of *Munera Pulveris*, Ruskin appreciated Mill's theory of natural conservation in *Unto This Last* 1862. He admitted Mill's theories were more prominent than any other economist's because of his references to natural beauty and his anxiety for its preservation. Moreover Ruskin stated his own theory of conserving forest, prior to the Sidgwick's account, which pointed out the function of forests to clean up air, to retain water and to stop cities warming from scientific and up-to-date point of view (Ruskin, 1862, p.165.).

Here we see that Ruskin's critique of Political Economy propounded a subjective theory of value, based on his original intrinsic value theory. And we appreciate his critical reference to air and water pollution problems in his day. We may infer he, more than other economists, could not so hesitate to blame the capitalist polluters that his ethical point of view could influence on avid readers such as Marshall and Pigou.

Ruskin financially supported his follower Octavia Hill's efforts to improve the housing of labourers. Hill participated in the CPS and later became one of the founders of the Natural Trust.

4.2. Jevons' notion of Disutility as a hidden theoretical tool for Cambridge Insiders and Environmental Economics

William Stanley Jevons (1835-1882) is well known as one of the theoretical revolutionists in Economics, who established the marginal theory of value in the early 1870s, when continental economists Léon Walras and Carl Menger did so simultaneously and independently. He published *The Coal Question* 1865 to analyse the issue of the exhaustion of coal, which caused a sensation. In 1871 he had published *The Theory of Political Economy* (TPE) based on his own value theory of marginal utility.

As for the depletion of coal, his rival Marshall noted that this was a long-term tendency, but substitution of other energy sources could only occur by increasing the price of coal (Marshall Alfred & Mary, 1879, p.26). Meanwhile Marshall's disciple Pigou again reviewed the exhaustion of coal in EW and concluded that it was an important element in the drastic decline of standards of welfare.

We do not regard the depletion of natural resources as environmental problems here. Rather in this paper we adopt a narrow definition of them and accordingly argue that environmental problems do not arise from original scarcity of non-renewable natural resources, but from making renewable

natural resources non-renewable. We think Jevons' contribution on today's Environmental Economics lies not in his analysis of the exhaustion of coal, but his introduction of the concepts of Disutility and its agent Discommodity, which he advanced in the second edition of TPE 1879. Indeed Marshall did not adopt these concepts; Pigou did and developed them in his original concept of Disservice, which suggested the root cause of environmental problems.

Jevons recognized Disutility in the section on Labour Theory in the first edition of TPE. He explained that labour was usually accompanied by some Disutility or pain from the starting point to the end via a short and exceptionally comfortable labour period. During the period of painful labour the utility of goods produced by the labour had to offset their Disutility. After a time when the exceptional happy labour ended, the increasingly painful but bearable labour continued and greater utility of goods was produced till another time when the decreasing marginal utility of goods could just offset the increasing marginal Disutility of the labour. At this point labour had to be stopped according to Jevons' hedonistic utilitarianism. We may recognize Jevons' labour theory influenced to Marshall's concept of "marginal disutility of labour" in his PE.

In his second edition, Jevons added a new section to chapter 3 dealing with the theory of utility. He then defined "Discommodity" as signifying "the opposite of commodity, that is to say any thing which we desire to get rid of, like ashes or sewage" and defined "Disutility" as "the opposite or negative of utility" (Jevons, 1879, p.63). Thus "we may invert the term disutility or the absence of utility" and "it is obvious that utility passes through inutility before changing into disutility, these notions being related as +, or 0 and -" (ibid.). He prided himself on this discovery, saying, "economists have not employed any distinct technical terms to express that production of pain, which accompanies so many actions of life" (ibid. p.63). He grasped the side effects or the negative or minus joint products, produced as we provide any pleasures to others simultaneously. We understand that only the labourer himself, according to Jevons, perceived the disutility of his labour, but Discommodities like "ashes or sewage" is perceived by anyone who suffered by them. The former is private but the latter is essentially social.

The task of his theory of labour was to determine the end of labour time theoretically, when decreasing utility could be offset by the increasing disutility of his or her own labour after some continuance. If we could insert his theory of Discommodity into his labour theory, we find the end of labour may be too late, because his Discommodities would necessarily be produced as social suffering, removed away from the work places, emitted to the public spaces to harm others. This would be environmental pollution. If society may add this social Disutility of suffering to one's own disutility of labour compulsorily, the ending of the labour would be sooner, the marginal utility of

labour at the ending point would be greater and the total utility that the labour should produce would be reduced.

Jevons' discovery of the concepts of Disutility and Discommodity has long been forgotten and their importance could thus not be mentioned in the texts of Environmental Economics. Certainly we find an exception of E. J. Mishan's usage of the concept "Bads" in his explanation of pollution problem in his *Growth: The Price We Pay* 1969, but he does not base this on Jevons' concept of Discommodity at all.

5. Marshall's theories and policies for urban amenity conservation

5.1. Fundamental concerns about living conditions of labourers

Alfred Marshall (1842-1924) chose his profession as a scholar of economics due to his strong desire to improve the inferior living circumstances of labourers in London. He sometimes referred to the need of fresh air for labourers. Firstly he advocated the need for "fresh air" for human life to recover from distress and to refresh the labourers' mood in his speech to the Reform Club (Marshall, 1873, p.106). This was recorded in "The Future of the Working Classes". Secondly, in 1884 he wrote an article entitled "Where to house the London poor" in *The Contemporary Review*. Here he insisted that "[w]hatever reform may be introduced into the dwellings of the London poor, it will still remain true that the whole area of London is insufficient to supply its population with fresh air and the free space that is wanted for wholesome recreation" (p.142). He also pointed out that excessive smoke, scarce light and loss of greeneries had reduced the physical strength of labourers and their children. Thirdly, in 1887 he wrote an article entitled "Is London Healthy" in *The Pall Mall Gazette* and was anxious about the loss of fresh air, light and healthy play grounds in London (p.367-368).

Marshall was elected as the second professor of political economy at Cambridge upon the sudden death of Fawcett. In 1890 he published his masterpiece *Principles of Economics* (PE). There are many references to and suggestions for the alleviation of housing and environment problems of labourers in this book.

Let us examine Marshall's recognition of these crucial problems. At the end of chapter 13 of PE, he describes how, after the abolition of the Corn Laws in 1846, the development of marine transport and the inland railway network could rapidly expand English import of raw materials. The increased population of urban labourers had lacked food and clothing but, argues Marshall, such

needs could be met since such commodities were now produced and imported in abundance. He insists, on the other hand, that the degradation of the natural and dwelling environment for urban labourers needing fresh air, daylight and housing, could not be so readily abated. Marshall recognized that the need for these collective, non-importable goods could not be met quantitatively and qualitatively, while the need for food and clothing could be gradually met. This understanding was shared not only by economists, but also by city authorities and activists concerned to improve labourers' living conditions.

5.2. The concept of “free goods” and understanding of the citizen’s privileges as goods

Marshall reconsidered the discourse of Mill, Fawcett, Sidgwick, Jevons and Ruskin. He improved the scope of his economics to apply his concept of “goods” to those housing and environmental problems as follows: In the beginning of Book 4, section 2 of PE, entitled “Wealth”, “wealth” is defined as “commodities” or “goods” (Marshall, 1890, p.106). These were explained by Mill from three points of view: individual, national and global. Marshall followed this. Marshall adopted the concept of “goods” based on the German noun “Gut” from Wilhelm Hermann’s definition in his *Staatwirtschaftliche Untersuchungen* 1832.

Marshall followed Hermann’s division of goods into “external” and “internal” and his further division of the former into “material” and “personal”. Hermann further divided these two into “transferable” and “non-transferable” and regarded “internal” goods as both “personal” and “non-transferable”, a classification also adopted by Marshall. Among these five categories, that most closely related to environment problems was “external, material and non-transferable goods”, which could be named “free goods” including, for both Hermann and Marshall, climate, daylight and air. Marshall described land in its original state as a “free good”.

Let us amplify on his material free goods. First of all, a temperate climate, daylight and fresh air could be regarded as free goods in Marshall’s economics and he did not regard them as “Natural Riches” which could be dealt with only politically, not economically, as by Mill, who urged governmental control of their use and even their partial nationalization, if necessary, but could not design indirect and economic regulations. Here we see progress in recognition of free natural resources as proper subjects of Economics. This allowed Marshall to suggest proposals for the conservation and creation of parks in towns, where labourers and their families could enjoy their leisure, sport and relaxation on common land. Marshall proposed the introduction of economic or

financial measures such as a “Fresh Air Rate (FAR)” in the 5th edition of his PE 1907, mentioned below.

In the first edition of his PE 1890, he described human rights as containing the enjoyment of the maintenance of public order and the accessibility to public facilities including man-made free goods or non-transferable collective goods. And in his second edition of PE, 1891, he added “privileges of citizenship” to these goods by regarding them as non-transferable goods. We may understand Marshall’s “privileges of citizenship” as containing rights of way and rights to access to natural common assets. He saw rights of way as goods in the second edition of his *The Economics of Industry* 1881, a joint work with his wife Mary, and he also expressed this recognition in the first edition of PE. Indeed, concerning rights of way and rights of access to natural common assets, Mill had referred them as the conventional rights of the rural community. For Marshall, however, once society has recognized rights to enjoy tolerable standards of living conditions including the right to daylight and other amenity rights covered by “privileges of citizenship”, then such rights should become respectable national wealth that should be protected by law and economic policies. Indeed Marshall proposed measures enforced by city authorities to regulate the development and building of urban districts mentioned below. Further he implicitly claimed the establishment of substantial amenity rights. By introducing such direct regulation of the above the returns, profit or utilities pursued by landlords, developers and building owners would be blocked. But just as recent Environmental Ethicists have suggested that “rights should precede social utilities” (Des Jardines, 2001, p.30), Marshall reasonably approved these regulations.

We may think the implications of Marshall’s understanding of fundamental rights of citizens as free and non-transferable goods were so important that he could ignore the implications of Jevons’ “Discommodities” and “Disutility”. Rather Marshall might conclude that invasion of these fundamental rights would become the objects of direct regulation and further would become taxed to provide compensation in kind to those denied such rights.

5.3. Proposals for the introduction of a “Fresh Air Rate” as the first Environmental Tax

In 1897 Marshall answered a questionnaire from the Royal Commission on Local Taxation and proposed the introduction of a “FAR” to be charged on all lands “having a special site value” in densely populated cities, which in addition to a poor rate would be earmarked to improve the living environment of labourers, e.g. by creating parks for fresh air and recreation. Marshall suggested that local authorities “under full central control” should introduce of this kind of local tax, because this

taxation might have negative effects on neighbouring cities (Marshall, 1897, p.361). The introduction of this kind of rate would influence landlords and developers. However Marshall's FAR would not become a heavy burden to them because improvement of the living conditions of labourers would eventually offset their burdens by increasing the value of their sites in the long run. Here we find his utilitarian way of persuading others to follow his economic policies.

The most important aspect of this proposal was that it was not a nationally but locally levied rate. Firstly it fitted a general understanding that the degradation of living conditions was a problem of local communities. Secondly it was important that this rate would be earmarked for recovery or greening projects to offset the loss of urban commons by expanding parks in cities. Certainly the effect of restraining future development and redevelopment projects by this taxation could be expected, but it would remain secondary. Thirdly it was the first proposal of an Environmental Tax by an economist, though many environmental economists even now believe Pigou's proposed environmental tax, which was not local and not earmarked for environmental recovery projects, was the first.

In 1907 Marshall published the 5th edition of PE and integrated his "FAR" proposal in the Appendix G without any substantial change (Marshall, 1907-b, p.804). In this Appendix, we see his measures for direct regulation to be introduced to resolve the urban environmental problems mentioned below.

5.4. Proposals for the introduction of direct regulation of chaotic urban development and building

Marshall already in the first edition of PE pointed out that urban development and building had led poor labourers to more a miserable situation regarding the need of fresh air, daylight, play grounds for children and recreation space for adults. In section 11, chapter 11, Book 7, entitled "Conflict between public and private interests as regards building on open spaces, and in other matters", based on Sidgwick's references to "the divergence between private and social interests", Marshall describes this divergence as an "ethico-economic problem" occurring "between collective and private interests" (Marshall, 1890, p.696).

He explains that "it is a difficult question to decide how far the expense of clearing open spaces in land already built on, shall fall on the neighbo(u)ring owners" and "it seems right that for the future every new building erected, save in the open country, should be required to contribute in money or

in kind towards the expense of open places in its neighbo(u)rhood” (ibid.). He had not yet proposed his “FAR”.

In Appendix G Marshall proposed taxation measures to restrain or to accelerate urban development or sprawl. Firstly he stated that it is unreasonable that the higher the property tax in overpopulated districts, the more the rich classes would move into the suburbs which belonged to other taxation regions, and that thus remaining labourers would have to bear the costs of social security for the poor in the slums. To resolve this problem, Marshall explained that local authorities would have to merge the suburbs into the cities (ibid. p.798). Secondly he proposed that if urbanization were needed, highly valued farmlands on the fringe of cities should be taxed, not on a basis of rent, but on their actual market price. This should suggest to local authorities a plan to set a differential taxation policy, that is to say an application of a residential tax rate to the farmlands in developing areas which we see in many developed countries today.

To preserve countryside, Marshall describes that “unless accompanied by energetic action on the part of urban authorities in planning out the line on which towns should grow, it would result in hasty and inappropriate building; a mistake for which coming generations would pay a high price in the loss of beauty and perhaps of health”(ibid.p.800). We may regard this as the first proposal by an economist to control the development of cities and the preservation of countryside by using zoning and taxation methods.

Marshall insisted that the need to control building by using bylaws in fringe districts had already introduced taxation on the market price of land where the building rush had occurred. He proposed the restrictions of building by an authorized coverage ratio, by which open space could be secured around high buildings. We recognize he was a pioneer in pointing out the necessity of introducing direct control by local authorities over town development and high building now commonly imposed in almost all developed countries.

5.5. Marshall’s definition of “Amenity”

In 1907 Marshall published a paper entitled “Social Possibilities of Economic Chivalry” as a valediction on his retirement and as a testament to his successors, especially to his heir Pigou. In this paper he made out “a new emphasis” on the watchword of economics, laissez faire: But not only “[l]et every one work with all his might”, but also “let the Government arouse itself to do that work which is vital, and which none but Government can do efficiently” (Marshall 1907-b, p.336). Here we see the inheritance of the thought of utilitarianism internalising others’ interests, developed

from Mill via Sidgwick or directly to Marshall. We also see that Marshall was the first economist using the term of “Amenity” by his own definition.

In this paper he advocates governmental support to secure the living conditions of citizens, by envisioning that “the State could so care for the amenities of life outside the house that fresh air and variety of colour and scene might await the citizen and his children very soon after they start on a holiday walk” (ibid., p.344). On his understanding, the comprehension of this concept of “Amenity” was going to prevail and “public authorities are just beginning to awake to the urgency of their duties with regard to . . . a task more vital to the health and happiness of coming generations than any other which can be accomplished by authority with a little trouble, while private effort is powerless for it”(ibid., p.336). In fact, the Housing, Town Planning, etc. Act of 1909 officially established the term Amenity and accompanied it with a few direct regulations over urban planning and building in towns.

Marshall’s theories and policies for urban amenity conservation influenced Ebenezer Howard and his movement of Garden Cities developed in the late of the 1890s, and Marshall supported him thereafter (Groenwegen, 1995, p.452).

6. Pigou’s cases of environmental problems, their causes and prescriptions for their remedy.

6.1. Environmental problem as an example of “the divergence between marginal social net product (MSNP) and marginal private net product (MPNP)”

Arthur Cecil Pigou (1877-1959), unlike his predecessors, was an economist in an age of world war and revolution. Naturally his economic concerns were widespread and included wartime and socialist economies, monopoly and nationalization, depression and panic, unemployment and public works, labour movement and environmental problems. He analysed the influence of these matters and problems on the distribution of economic resources from his point of view to maximize economic welfare. He located the environmental problems of his day among a series of social problems distorting resource distribution, e.g. the depletion of natural resources, excess or lack of public works, alienation of labourers as human capital and exploitation by a monopolistic economic system. He explains some cases of environmental problems, suggesting their root causes and prescribing remedies for them by analysing many cases of the divergence of MSNP and MPNP

(details below). We may now address his approach based on not the first edition of EW 1920, but the fourth edition 1932, which finished all revision by him.

On Pigou's definition, the MSNP "is the total net product of physical things or objective services due to the marginal increment of resources in any given use or place, no matter to whom any part of this product may accrue"(Pigou, 1932, p.134). While the MPNP "is that part of the total net product" of the same things and services "which accrue in the first instance – i.e. prior to sale – to the person responsible for investing resource there" (ibid. p.134-135). He demonstrates the divergence between the above two by showing three types.

Pigou cites as illustrative of the first type of divergence, the case of primitive lease agreements of farmlands between landlords and tenants lacking any obligations of landlords to compensate for the remaining value of the invested landed capital by the tenants at the expiration of the lease. In this case, we see that a restriction on the improvement of land productivity would occur. In contrast to this case, he points out that there are other primitive agreements lacking any restriction (obligation of tenants to prevent and to recover in kind the exhaustion of fertility or to compensate for it) on the exploitative cultivations by tenants just before the expiration of the lease(ibid. p.175). The yield of the coming tenants declines in this case.

The second type of divergence includes many cases in which investors and their labourers bring about positive or negative side effects on third parties. This includes the environmental problems of those days and Pigou points out their root causes specified in the next section. He also describes the third type of divergence as cases of alienation of labourers through primitive operations in big factories which leave their capabilities underdeveloped. On the other hand he points out some labourers will develop their capabilities through their activities in Worker's Associations and will become independent farmers with high abilities to manage their own allotments well.

6.2. Pigou's concept of "Disservice" as a root cause of environmental problems

Pigou characterizes the above-mentioned second type of divergence between the MSNP and MPNP. "Here the essence of the matter is that one person A, in the course of rendering some service, for which payment is made, to a second person B, incidentally also renders services or disservices to other persons (not producers of like services), of such a sort that payment cannot be exacted from the benefited parties or compensation enforced on behalf of the injured parties" (ibid., p.183). He particularizes many cases of incidental positive or negative services mentioned above. But we can distinguish environmental problems from other cases by introducing our tentative definition of

environmental problems, in that there follows any degradation of utility of natural common goods among the same generation and between different generations by their private and collective use of the relevant goods. Today we refer to positive and negative environmental externalities.

From this point we focus upon the environmental problems among Pigou's examples. In cases of environmental problems cited by Pigou, where incidental positive services result in an excess of MSNP over MPNP, there are following examples (ibid. p.184-185):

- (1) private parks in cities improve the quality of air in the neighbourhood.
- (2) forestation has beneficial effects on climate beyond forest districts.
- (3) prevention of smoke from factory chimneys reduces harm to neighbouring buildings and vegetation.

In some cases of environmental problems, where incidental harm (disservices) results in the reduction of MSNP under MPNP, there are following examples (ibid. p.185-186):

- (1) game conservation, e.g. of rabbits causes escape onto neighbouring land
- (2) erection of building in residential districts of cities destroys the amenity of the neighbourhood
- (3) high buildings on residential sites denies light to neighbours
- (4) development projects in crowded centres of cities diminish open space and recreation areas of the neighbourhood.
- (5) sparks from train engines cause uncompensated harm to people, that affect directly to owners of woods along railways and indirectly to the commoners of woods (ibid.p.134)

It is clear that Pigou's identification of the root cause of environmental destruction as an incidental Disservice accompanying economic activities using air, water and other common natural resources. This view was based on Jevons' concepts of Disutility and Discommodity caused only by objective materials, but Pigou extended them to include subjective activities i.e. Disservice. Here we understand our economic activities, especially the production of goods, may originally accompany Disservices to third parties. Before Pigou's analysis of these causes, economists could not clearly identify enterprises naturally causing air and water pollution, but he could then specify concrete causes of the pollution and could prescribe remedies as we see next section. In addition we know many excellent enterprises in developed countries now introduce voluntary scheme of environmental management and auditing. Just based on Pigou's theory, we can understand eco-

friendly activities conducted by company managers and performed by employees are the trials to discover their own Disservices and to reduce them technically through Eco-R&D.

6.3. Comprehensive prescriptions for environmental problems

The reason why environmental economists regard Pigou as a pioneer of this discipline is that he could not only analyse particular causes of environmental disruption, but his prescriptions for their remedy are comprehensive and concrete. As mentioned above, as a case of the first type of divergence between MSNP and MPNP, one of the root causes of overexploitation of soil fertility was primitive tenancy agreement for farmland lacking the regulatory provisions. He pointed out other causes of this, e.g. that Land Tenure Acts and amendments in the early 1900s could not restrict exploitative cultivation by greedy tenants. Pigou's prescription for this case suggested that Land Tenure Acts had to provide measures for the prevention and prohibition of overexploitation of soil (e.g. any obligation to supply a quantity of muck) and individual tenancy agreements had to comply with the statute. Here we find a development of the understanding of the soil, from Ricardo's definition as "indestructible" power (Ricardo, 1970, p.67), deduced from the mineralogical point of view, to the definition of "destructible" deduced from the ecological one.

Pigou properly understood that burning process had to result in the production of smoke Disservices and it was possible to control the emission of smoke technically (Pigou, 1932, p.184). He thought that innovation in technology could prevent a lot of smoke and improve the efficiency of burning at the same time, and reduce the use of coal to increase profit. He blamed factory owners for not to innovate and introduce those new engines, which could pay enough, because of their "mere ignorance and inertia"(ibid.). We also appreciate his progressive way of thinking here because we could perceive the concept of "Pollution Prevention Pays" (8) only after the two oil price shocks in 1970s. As we examine Pigou's proscriptions for smoke pollution, however we meet some disputable points. He recommended governmental introduction of "extraordinary encouragements" and "extraordinary restraints" or "bounties and taxes" by stipulating that it was "possible for the State, if it so choose" (Pigou, 1932, p. 192). It is questionable that the stick of taxation can wake up "ignorant" management of firms to produce improved and less smoke emitting engines profitable to them, or that the carrot of subsidy can rid management of their "inertia".

We may then have a question how much disciplinary tax and reward or bounty is needed. Many environmental economists have sought to determine the appropriate level of environmental taxes and subsidies. They have named this kind of tax Pigouvian and pointed out its indeterminacy as one

of its very defects. But Pigou recognized these problems well and he himself took them up in his *Socialism versus Capitalism* 1937. He noted that “the practical difficulty of determining the right rates of bounty and of duty would be extraordinarily great”, because “the data necessary for a scientific decision are almost wholly lacking” in both social systems (Pigou, 1937, pp.42-44).

Of course, Pigou also suggested some measures to conserve urban amenity using “authoritative control in addition to providing bounties”, that was almost the same as Marshall’s specified above. Indeed Pigou insisted that restriction on the density and height of town buildings in towns and measures for “collective problems” of beauty, of air, of light, and other social capitals such as gas and water, should be introduced (Pigou, 1932, pp.194-195).

6.4. Remaining problems

Certainly Pigou’s considerations of environmental problems in his EW have influenced many economists. After the presentation of his analytical tool, “the divergence between MSNP and MPNP”, the concepts of “social costs” and “private costs” prevailed among economists, who developed them on their own understanding. Some different conception that regards social costs as the divergence between the MSNP and MPNP in itself occurs. Pigou properly paraphrased the “divergence between the MSNP and MPNP” in *Economics in Practice* 1935 as “the social cost of his (alcoholic drink manufacturers) investment, at the margin, being thus greater the private cost”, because “the Government is forced to expend more money on the police force” (Pigou, 1935, p.118). And in the context of the above quotation from *Socialism versus Capitalism*, he properly used the expressions of “private cost” and “social cost” or “private and social cost” (Pigou, 1937, pp.42-44).

In 1950 William Kapp published *The Social Costs of Private Enterprise in the U.S*, which became the second Mecca of Economics and environmental pollution. He focused precisely on the balance between Pigou’s private and social cost. This meant the calculating of human and material damage, but he occasionally called this balance itself “social loss” or “social cost”, but clearly did not distinguish them (Kapp, 1950 pp.13-14).

Ronald Coase published his famous article, “The Problem of Social Cost” 1960 in the U.S., and focused on compensation expenditure for sufferers or on the compensation for the reduction in the causers’ profit caused by the voluntarily negotiated suspension of the offending activities. He also analysed prevention expenditure as an alternative to the above two, suggesting that social costs

were some kind of expenditures paid either by causers or sufferers to resolve the environmental problems.

Pigou's concept of social cost, used in his references to environmental problems, meant the sum of private costs and uncompensated damage to man and substances. It had to be abstract and contain "ought" judgments. In contrast Kapp's and Coase's concept of social costs were concrete and pragmatic in that we can determine them by using reference to court judgments and the voluntary compensation agreements of the parties. But it is difficult to decide whether Pigou's or others' concepts are more useful to analysis of actual environmental problems theoretically and politically. On Pigou's explanations, he could reasonably ignore the interests of other suppliers of the same Disservices on the same labour sites, though they might be restricted in their labour by the sufferers. He also could ignore the employers' (investors or firms) interests from these Disservice labours, though they might reduce their profit. And he could ignore the interests of the customers of these firms too. If some economic activity accompanies some disservice and service for others simultaneously, which may happen in Pigou's example of animal conservation in some sites versus neighbouring farmers, then the total of the Disservice (loss of crops) and service (satisfaction of conservationists) will help to determine whether some direct regulation, some indirect fiscal measure or some mixture of them will be appropriate. Eventually Pigou would be ambiguous about these problems, which have become objects of cost-benefit analysis today (9). But at least we reconfirm that Pigou clearly approved of authoritative control over environmental problems interfering with fundamental human rights, just as Marshall did not resolve them by using only economic, but legal measures, because "rights should precede social utilities".

7. Supplementary Remarks

Complementarily we can find out a successor of these Cambridge traditions in J. M. Keynes' appreciation of the beauty of the countryside and his apprehension of the air pollution in London in his "National Self-sufficiency" 1933 (Keynes, 1981, p.242).

There was, however, a criticism of CEET. It was Lionel Robbins' insistence on the strict distinction between normative and positive science, based on his methodological individualism based on Max Weber's "Wert Freiheit". In *An Essay on The Nature and Significance of Economic Science* 1932, Robbins insisted that "[o]ur a priori deductions do not provide any justification for saying that caviare is an economic good and carrion a disutility" and "both individual valuations and technical fact are outside the sphere of economic uniformity"(Robbins, 1932, p.98). He required of the

Cambridge School “the dissociation of Economics from Ethics” or “distinction of Economics from Ethics” (ibid. pp.132-135). Robbins’ criticism of Jevons’ concept of Disutility meant directly his criticism of Pigou’s Disservice. We confirm however that Jevons and Pigou clearly understood that their evaluation of minus utilities or minus services could not be individual and subjective, but collective, inter-subjective and fundamentally social (10). However Robbins fully failed to understand this point.

Pigou strangely accepted “the dissociation of Economics from Ethics” in *Economics in Practice*. On the other hand, Keynes expressed his criticism of Robbins’ definition of Economics in his letter to Roy Harrod: that “as against Robbins, Economics is essentially a moral science and not a natural science, that is to say it employ introspection and judgment of value” (Keynes, 1973, p.297). Consequently dispute about this point continues and on which side our Environmental Economics should stand is so difficult to decide that no one can easily resolve this puzzle even today.

Mill directly affects today’s Environmental Economics, although perhaps not necessarily through the Cambridge School. In 1973, Herman E. Daly insisted the need to go back to Mill’s theory of the SS as we discuss the sustainability of economy and environment in his article entitled “Steady-state Economics”. Since then he has developed his own SS Economics or Ecological Economics, based on the Entropic Economics of his teacher, Nicholas Georgescu-Roegen, which are based on the second law of thermodynamics. As Daly pointed out in his *Beyond Growth* 1996, Frederic Soddy, who was a winner of the Nobel Prize for chemistry in 1921 for the discovery of the radioactive isotope, started to investigate his own “Sustainable Economics” after the First World War. His change from chemistry to economics had been triggered by recognising that we need to change economic systems to realize the peaceful use of atomic power and by reading Ruskin’s criticism of economics. In this way there may be other possibilities of today’s Environmental Economics to develop not necessarily via CEET.

After the late 1960s, Environmental Economics in the West and in Japan started reconsidering Pigou’s analyses of environmental problems. Unfortunately, there are not so many studies enquiring into the establishment and development of CEET before Pigou. We hope this paper covers this.

Notes

- 1) This paper is based on a recent paper written in Japanese, Masayuki Omori, 2005, "Cambridge Kankyo Keizai Shiso no Keisei to Tenkai", eited by Mitsuo Kaneko et al.(2005), Kankyo no Shiso to Rinri, Ningenko Kagakusha, Tokyo
- 2) Our simplest distinction between Environmental Economics and Ecological Economics (synonymous with Sustainable Economics) is as follows. Environmental Economics treats renewable natural resources and treats non-renewable energy resources, such as coal and petroleum, as causes of pollution. On the other hand, Ecological Economics treats the former and treats non-renewable natural resources e.g. as irreversibly exhaustible those matters strictly dominated by the second law of thermodynamics. Environmental Economics relies on the premise of a relatively weak sustainability between man and nature in the not so long run, but Ecological Economics premises a relatively strong sustainability in the long run.
- 3) Smith, in his Theory of Moral Sentiment, might be seen as pro-development, because he praised the beauty of man-made-nature so much. He wrote: "It is this (deception) which first prompted them (the industry of mankind) to cultivate the ground, to build houses, to found cities and commonwealth, and to invert and improve all the sciences and art, which ennoble and embellish human life; which have entirely changed the whole face of the globe, have turned the rude forests of nature into agreeable and fertile plains". (Smith, 1976, PP.183-184) Unlike Smith, Mill found nobleness and embellishment of "the rude forests of nature" for human life.
- 4) Mill defined rights in general, including access rights and rights of way as follows. "When we call anything a person's right, we mean that he has a valid claim on society to protect him in the possession of it, either by the force of law, or by that of education and opinion. If he has what we consider a sufficient claim, on whatever account, to have something guaranteed to him by society, we say that he has a right to it". (Mill, 1969, p.250)
- 5) Environmental Economists and Environmental Ethicists tend to understand the roots of the word "Land Ethics" is the last chapter of A Sand Country Almanac and Sketches Here and There by Aldo Leopold in 1949. But we see the original thought to preserve wild and its habitats was written in Mill's PPE 1848.
- 6) Explanations of Eco-centric thought, thoughts of the Animal Rights and Deep Ecology movements that criticize utilitarianism including Mill's as anthro-po-centric thought are see in e.g. Des Jardines(2001).
- 7) See Murphy Graham (2002), Foundations of National Trust, New Edition, National Trust

Enterprises Ltd.

- 8) See Royston Michael G. (1979), *Pollution Prevention Pays*, Pergamon Press, Oxford and (1982), "Making Pollution Prevention Pay" in edited by Donald Huisingh and Vicki Bailey (1982), Pergamon Press, New York
- 9) See Des Jardins (2001), chapter 3 of *Ethics and Economics*
- 10) We may identify the distinction between positive and negative utility as historical and institutional.

References

- Des Jardines Joseph R. (2001), *Environmental Ethics*, Third Edition, Wardsworth
- Fawcett Henry (1869), *Manual of Political Economy*, Third Edition, Macmillan &Co.
London
- Groenwegen Peter D. (1995), *A Soaring Eagle Alfred Marshall 1842-1924*, Edward
Elgar
- Hishiyama Izumi (1990), *Quesnay kara Sraffa he*, Nadoya University Press
- Jevons (1879), *Theory of Political Economy*, Second Edition, Macmillan, London
- Kapp K. William (1950), *The Social Costs of Private Enterprise*, Harvard University
Press, Massachusetts
- Keynes John Maynard (1973), "After the General Theory", in *The Collected Writings of
John Maynard Keynes* 14, Macmillan and Cambridge University Press,
London
- (1981), "National Self-sufficiency", in *The Collected Writings of
John Maynard Keynes* 21, Macmillan and Cambridge University Press,
London
- Marshall Alfred (1873), "The Future of Working Classes", edited by A. C. Pigou
(1956), *Memorials of Alfred Marshall*, Kelly & Millman Inc., New York
- (1884), "Where to House the London Poor", edited by A. C. Pigou
(1956), *Memorials of Alfred Marshall*, Kelly & Millman Inc., New York
- (1887), "Is London Healthy?" in Whitaker (1996), *The Correspondence
of Alfred Marshall*, Economist, vol.1, Climbing, 1868-1890, Cambridge
University Press.
- (1890), *Principles of Economics*, First Edition, Macmillan, London
- (1891), *Principles of Economics*, Second Edition, Macmillan, London
- (1897), "Memorandum on the Classification and Incidence of Imperial
and Local Taxes", in edited by J. M. Keynes (1926), *Official Papers by Alfred
Marshall*, Macmillan & Co., Ltd. London
- (1907-a), *Principles of Economics*, Fifth Edition, Macmillan, London
- (1907-b), "Social Possibilities of Economic Chivalry", edited by A. C.
Pigou (1956), *Memorials of Alfred Marshall*, Kelly & Millman Inc., New York
- Marshall Alfred and Marshall Mary (1879), *The Economics of Industry*, First Edition,

- Macmillan, London
- Mill John Stuart (1965 [1871]), Principles of Political Economy, seventh edition, in
 Collected Works of John Stuart Mill, 2-3, University of Toronto Press,
 Routledge & Kegan Paul
- (1967 [1871]), “Land Tenure Reform”, Essays on Economics and
 Society, in Collected Works of John Stuart Mill, 5, University of Toronto
 Press, Routledge & Kegan Paul
- (1969[1861]), Utilitarianism, in Collected Works of John Stuart Mill,
 10, University of Toronto Press, Routledge & Kegan Paul
- (1981[1873]), Autobiography, in Collected Works of John Stuart Mill,
 1, University of Toronto Press, Routledge & Kegan Paul
- (1988 [1871, 1873]),”Land Tenure reform 1,2, Public and
 Parliamentary Speech 1869-1873, in Collected Works of John Stuart Mill,
 29, University of Toronto Press, Routledge & Kegan Paul
- Pigou A. C. (1932), The Economics of Welfare, Fourth Edition, Macmillan, London
- (1935), Economics in Practice, Macmillan, London
- (1937), Socialism versus Capitalism, Macmillan, London
- Ricardo David (1817), On The Principles of Political Economy and Taxation, in edited
 by Piero Sraffa (1970), The Works and Correspondence of David
 Ricardo, Vol.1, Cambridge University Press
- Robbins Lionel (1932), An Essay on The Nature and Significance of Economic Science,
 First Edition, Macmillan London
- Ruskin John (1862), Unto This Last: Four Essays on The First Principles of Political
 Economy, Smith, Elder and Co. London
- (1872), Munera Pulveris: Six Essays on The Elements of Political Economy,
 Smith, Elder and Co. London
- Smith Adam (1976 [1759]), The Theory of Moral Sentiment, Clarendon Press, Oxford
- Sidgwick Henry (1883), The Principles of Political Economy, First Edition, Macmillan,
 London
- (1996 [1901]), The Principles of Political Economy,, Third Edition,
 Thoemmes Press, Bristol [Macmillan]
- Stephan Leslie (1885), Life of Henry Fawcett, Smith Elder & Co., London.