Nature and labour. Theoretical approaches and metaphors of wealth in economic discourse before the classics

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Abstract. Within the approach which considered nature as an essential part of economic discourse, in the seventeenth century and during the early decades of the eighteenth, there occurred a conceptual reversal regarding the relationship between land and labour as agents of production of wealth. Mercantilists attributed to labour the capacity to produce wealth, and they considered land as matter, while Physiocrats attributed reproductive capacity to land, and viewed labour as either a mere support for reproductive processes or a useful, but sterile, capacity to transform natural products. These perspectives emerged not only from theoretical analyses but also from less structured conceptions in which metaphors played a role because of their capacity to provide preliminary conceptual frameworks. Particularly important in this process was the reformulation of the notions of 'matter' and 'form'.

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1. Introduction

Pre-classical economics, from early mercantilists to Physiocracy, can be viewed in light of what Margaret Schabas (2005) has called the "natural origins of economics", a perspective according to which economic phenomena, "as contiguous with physical nature", were regarded "as part of the same natural world studied by natural philosophers", and "were understood mostly by drawing analogies to natural phenomena" (Schabas 2005, p. 2).

This approach comprised two alternative interpretations of relationships between land and labour. One, in the age of Mercantilism, attributed to labour a predominant role in the production of wealth with respect to land (see Perrotta 2004, pp. 166-7); the other, supported by the physiocrats,

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considered formation of wealth as a consequence of generative capacities of land, and attributed to labour circumscribed roles of either support for natural processes or mere transformation of natural products.

To different extents, both perspectives mixed 'visions' and more composite analyses. Metaphors and theoretical terms deriving from the Aristotelian tradition were partially revitalized and used to explain relationships between land and labour. A similar phenomenon was analyzed by Arthur O. Lovejoy in reference to the "great chain of being". When he propounded the "history of ideas" as an alternative approach to the history of schools of thought, Lovejoy emphasized that some recurrent "unit-ideas" are present in alternative philosophical systems and that despite the differences of schools of thought, the "seeming novelty of many a system is due solely to the novelty of the application or arrangement of the old elements which enter into it" (Lovejoy 1936, p. 4). For this reason, he suggested employing "philosophical semantics" to investigate those phenomena, that is, a study of

> "words and phrases of a period or a movement, with a view to a clearing up of their ambiguities, a listing of their various shades of meaning, and an examination of the way in which confused associations of ideas arising from these ambiguities have influenced the development of doctrines, or accelerated the insensible transformation of one fashion of thought into another, perhaps its very opposite" (Lovejoy 1936, p. 14)

The use of an Aristotelian lexicon which describes land and labour in terms of matter and form over time recalls this kind of process. Authors of the seventeenth century employed some Aristotle's notions, and combined them with ideas from other theoretical traditions. But traces of that language persisted also in the eighteenth century, for example in Cantillon's and Mirabeau's works. Even when those concepts were little more than commonplaces, recombination of their meanings contributed to the formation of conceptual frameworks intended to answer a pressing question: the origin of wealth in modern, commercial, societies.

Also certain metaphors contributed to the formation of conceptual frameworks. Metaphors, like those which represented land and labour respectively as the 'mother' and 'father' of wealth, and as

'male' and 'female', extended the meaning of Aristotle's notions of matter and form, and in some way they were evoked to represent the rise of wealth. Rather than being 'dead metaphors', as many studies implicitly or explicitly maintain, they were 'dormant metaphors', that is, metaphors which have lost their character of novelty, because of their use in common language, which awaken and acquire an 'unusual character', in consequence of change of the contexts in which they are usually inserted (Perelman and Olbrechts-Tyteca 1969, pp. 405-407). More in general, metaphors perform a cognitive and heuristic function. They help to explore unknown phenomena by re-using through analogy terms and concepts borrowed from other fields of human experience and from other sciences, because they preliminarily organize our ideas about certain phenomena, especially when a comprehensive theory is not available. In this sense, they are not simple linguistic phenomena, but conceptual tools which coexist and interact with theoretical discourses.[1]

All these elements help in analysis of how relationships between land and labour were interpreted between the seventeenth century and the early decades of the eighteenth; an analysis that is organized as follows. Section 2 examines Aristotle's notions of matter and form in relation to other conceptual and metaphorical couples such as potentiality/actuality, female/male, mother/father, earth/labour, and it shows how in that approach labour performs a fundamental role with respect to the earth in (re)productive processes. Section 3 considers Petty's metaphor of land and labour respectively as mother and father of the wealth, where the father as "active principle" performs an important role in production of wealth. Section 4 shows how the distinction between matter and form and between land and art/labour led to distinction, but not to opposition, between the concepts of 'natural' and 'artificial', since the union of land and labour was interpreted in terms of cooperation. If on the one hand art was conceived as imitation of nature, on the other it was considered a 'perfection of nature'. In economic terms this means that, while nature is characterized

[1] The literature on cognitive nature of metaphors is huge. However, at least three authors should be mentioned: Max Black, Mary Hesse and Richard Boyd. Black (1962) explained that metaphors reorganize our ideas about a certain object. Hesse (1966) showed the relation between deductive models of scientific explanations and metaphors. Boyd (1993, p. 490) maintained that metaphors "represent one strategy for the accommodation of language to as yet undiscovered causal features of the world".

by scarcity, both labour and art, as the main agents of production of wealth, multiply and change form of natural products. Section 5 examines how Locke dealt with relationships between land and labour. Also in his perspective, labour cooperates with a nature characterized by scarcity, and it is the source of value because it transforms natural products. However, labour not only cooperates with but also opposes nature, because the act of labouring entails taking something away from nature. This subtraction is at the basis of private property and implies that a natural object is removed from the state of nature and acquires a new identity. In short, Locke, unlike some authors of the seventeenth century, put forward the idea that cooperation and opposition between nature and labour are two sides of the same coin, but he shared the opinion widespread in his time that labour has a predominant role in the production of wealth. Section 6 discusses Cantillon's view of land and labour as respectively the matter and form of wealth. Although Cantillon re-uses these concepts, he also develops a view of formation of surplus in agriculture. Section 7 considers Mirabeau's work as representative of the change that occurred in the interpretation of relationships between nature and labour. Initially, Mirabeau interpreted Cantillon's distinction between matter and form in traditional terms, and emphasized the predominant role of labour in producing wealth. Subsequently, after meeting Quesnay, he reversed this perspective and considered land as the main source of wealth. Section 8 illustrates how, from Linnaeus to Quesnay, nature was increasingly seen as a privileged place in which reproductive processes occur and determine the surplus of the market, while labour was viewed as either a support for natural reproductive processes or a transformative activity unable to produce surplus. This is interpreted as a reversal which occurred between the seventeenth and eighteenth centuries within the paradigm of naturalization of economics: that is, the approach which considered the economic sphere as dependent on the natural sphere.[2] Section 9 provides some concluding remarks.

[2] I prevalently consider debates which focused not on inanimate nature, but on living nature.

2. Aristotle's conceptual couples: matter and form, female and male, earth and labour

The co-occurrence of matter as 'mother', and form as 'active principle', to which respectively the earth and labour are associated, dates back at least to Aristotle. Matter potentially includes the determinations of being, and it represents the possibility to receive a form, where giving form is the operation by which matter is shaped. The relationship between matter and form, which in Aristotle relates to the one between potentiality and actuality, is apparent in artisanal production, where the artisan shapes a matter which can potentially receive many forms. Aristotle maintained that these processes characterize also living beings, and that the conceptual couples 'matter/form' and 'potentiality/actuality' are associated with the couple 'mother/father'. In reproductive processes the male, as "source of movement", gives life and form to the matter provided by the female. This means that the father has an active role, while the mother as matter is simply characterized as potentiality.[3] This perspective can be extended to the "the universe as a whole" where "the earth's nature is thought of as female and mother" (*De Generatione Animalium*, henceforth GA, I, 2, 716 a, 14-17). Therefore, an association between two sets of terms is established: on the one hand, 'female', 'mother', 'matter', and 'earth', on the other, 'male', 'father', 'source of movement', 'form', and 'labour'. Labour pertains to the second set of terms because it possesses the capacity to transform the matter, giving it an end which manifests itself in the final product. The relationship between transformative processes activated by labour and transformative processes of sexual reproduction are illustrated by an analogy: as the male does not provide the matter for the offspring, so "nothing comes away from the carpenter to the matter of the timber". The carpenter's "hands move the tools, and the tools move the matter. Similarly the male's nature […] uses the seeds as a tool containing movement in actuality, just as in the productions of an art the tools are in movement" (GA I, 22, 730 b, 13-23, see also GA, II, 1, 734 a, 734 b, 735 a, and Balme 1972, p. 152).

[3] Among living beings, which are characterized by sexual reproduction, "the male provides both the form and the source of movement while the female provides the body, i.e. the matter" (GA, I (A), 20, 729 a, 9-12).

Labour, and in particular artisanal labour, changes the form of the matter and exhibits male features of creation and reproduction which distinguish it from passivity of the matter.[4] Production of a new entity, both as a useful good and as a new living being, coincides with the process of giving form, and this makes it possible to liken labour activity to biological processes. The only difference is that in labour activity the final cause is external, while in sexual reproduction it is internal to the final product. The process of creation needs the indispensable cooperation (a union, more precisely) between the labour-father and the earth-mother, although the prevalence of the father with respect to the mother in both creation and (re)production is evident.

3. Aristotelian heritage: land and labour

Traces of the Aristotelian approach which interprets the relationship between earth and labour in terms of parental figures, whose union metaphorically illustrates *how* wealth is engendered, are present in the seventeenth century. Arguments of this kind of were not completely hackneyed, and – at least partially - contributed to conceptually framing a problem which was unresolved in analytical terms: the cause of wealth generation. This could explain why Aristotelian commonplaces survived, even though opposing systems of thought related to scientific revolution were imposing themselves in European culture. As Lovejoy (1936) explains, certain concepts and words may reappear in re-contextualized form even within discourses radically different from the original ones. This happened also to some Aristotelian ideas, which authors of the age of Mercantilism recombined within new perspectives.[5] Moreover, Aristotelian biology continued to be

[4] Some scholars have criticized Aristotle's reduction of female to inert matter (see Dean-Jones 1994, pp. 14–15 and p. 177). By contrast, others maintain that in Aristotle's writings the female is not reducible to raw material, and performs a more active role in sexual reproduction (see Mayhew 2004 and Connell 2016).

[5] As discussed in this section, for example, traces of Aristotle are in William Petty's writings, although he was strongly influenced by anti-Aristotelian philosophers like Bacon and by Hobbes (Aspromourgos 1996, ch. 4; Ullmer 2011). Also Malynes and Misselden reformulated certain Aristotelian ideas and, according to Appleby (1978, p. 244), Misselden and Mun reasoned "in the spirit" of Francis Bacon, although on this point Magnusson (2015, p. 152) is

employed in the seventeenth century (Bernardi 1980, p. 12 and p. 46), for example in Harvey's theory, and it is not surprising that it was the source of analogies and metaphors used in fields of knowledge perceived as contiguous.

Although the images of the earth-matter-mother and labour-form-father rarely gave rise to structured investigations on the generation of wealth, they exerted a certain influence on some analyses on trade as a (sometimes tacit) pre-analytical assumption. Mercantilists did not confuse wealth with money (Perrotta 2004, pp. 164-5; Magnusson 2015, p. 103), and analyses of its rise, also with the help of metaphors, focused on the combination of labour and land. The majority of them would have agreed with Charles Davenant that

"Gold and Silver are indeed the Measure of Trade, but that the Spring and Original of it, in all nations is the Natural or Artificial Product of the Country; that is to say, what Land or what this Labour and Industry Produces" (Davenant 1699, p. 12, quoted in Magnusson 2015, p. 101).

"Land and Labour", Petty (1662, pp. 44-45) maintains, are "two natural denominations" by means of which "all things ought to be valued", although it is preferable "to finde out a natural Par" between them. Since production of wealth depends on land and labour, this can be described as the result of an organic relationship between these "two natural denominations": "Labour is the Father and active principle of Wealth, as Lands are the Mother" (*Ibid.*, p. 68). This famous expression metaphorically suggests that wealth is the offspring of labour and land, although the two parents do not contribute in the same way to its birth, given that only labour incorporates the "active principle of Wealth", a concept that in Aristotle refers to the creative "source of movement".[6] The prevalence of labour is also illustrated in another passage, where "the Wealth" is considered as "the effect of the former or past labour" which does not differ from "efficiencies in being" (Petty 1691b, p. 110). Here land is not mentioned, while the role of labour as active principle is emphasized. However, the

more cautious. Alternatively, Dudley North (1691, p. 11) opposed Descartes' method to hypothetical reasoning, where this latter includes the Aristotelian concepts of "matter, form and privation".

[6] Images of labour appear also in the Bible. In *Genesis*, God works and his labour is creation (Gen. 1, 1 and 2, 3). He uses his hands to give form and life to inert matter (the "ground" from which man and animals are moulded (Gen. 2, 7 and 19)). And man, who similarly works, in some way through his labour is associated with Divinity.

biological and reproductive features of land and labour appear also when Petty (1676, p. 377) maintains: "Hands being the Father, as Lands are the Mother and Womb of Wealth". The "Hands" evoke the creative process of labour, and since they are the "Father", this creative capacity has male features. Also in this context, since land exhibits maternal features, wealth appears as an offspring which develops in the 'womb' of the mother.[7]

4. Art as improvement of nature and a tool which multiplies the capacity of labour

Hylomorphisms and in particular 'matter' and 'form' were widely used in the seventeenth century. Bacon, Kepler, Harvey, Hobbes, Gassendi, Descartes, Malebranche, Newton, and Leibniz used those concepts in a variety of forms in their investigations, also when provided theories alternative to Aristotle's one (Manning 2012). Similarly this occurred also in the context of economic discourses.

Malynes and Misselden reinterpreted Aristotle, and provided alternative views of the relationship between matter and form. Malynes (1622, p. 500) suggested that the "essence or existence of things" is determined by "matter and form and privation", where "privation" is an Aristotelian term (*Metaphysics* V, 1022 b 22 - 1023 a 7; XII, 1069 b 33; *Physics* 192a 3) which refers to becoming, and indicates the lack of form usually required by the nature of a thing.[8] Misselden (1623) accused Malynes of having misinterpreted Aristotle, and having confused the "principles" of natural and artificial things, which consist of "matter and form and privation", with

[7] This image can be compared to the non-metaphorical explanation of the rise of rent in terms of surplus: "Suppose a man could with his own hands plants a certain scope of Land with Corn […] I say, that when this man hath subducted his seed out of the proceed of his Harvest, and also, what himself hath both eaten and given to others in exchange for Clothes, and other Natural necessaries; that the remainder of Corn is the natural and true Rent of the Land for that year" (Petty 1662, p. 43).

[8] Privation is not simple negation, but the predisposition of matter to acquire a certain form. Some aspects of the debate on matter, form and privation in the seventeenth century are illustrated in Manning (2012, pp. 16-32).

their "essence", which is composed exclusively of two terms: "matter and form" (*ibid.,* p. 9).[9] But matter and form do not have equal roles, since "essence" depends on form. In a natural entity like man, essence is exclusively given by the matter (i.e. the body) and the form (i.e. the rational soul), but it is the form which distinguishes man from other creatures made of similar matter. Similarly in an artificial thing like a house the matter "is stone and timber", and the form "is the fashion or proportion after which it is built" (*Ibid*., p. 10), but it is the form which distinguishes a house from a ship. These analogies regard also commerce: "Commodities and Mony, are the *Matter* of trade: the manner of buying and selling, is the *Forme* of trade" (*Ibid.* p. 7), but are not the "materials of trade" which determine commerce.[10] Finally, Misselden observes that privation regards "principles" and not "essence" of things, and ultimately depends on the fact that form appears in two ways: it is absent as "terminus a quo" and present as "terminus ad quem" (*Ibid.* pp. 11-12).

Given these premises, it is unsurprising that Aristotelian notions of matter and form were employed to investigate the role of nature and labour in productive processes, and that a privileged role in wealth creation was assigned to labour as form.

Johnson (1937, chap. 13), maintained that in the seventeenth century "art", a term closely related to labour, "as human agent [was] opposed to nature" (*Ibid.*, p. 260)[11], but in pre-classical economics art and nature were considered complementary rather than opposed forces, as Petty's metaphor of the union of the father and of the mother, and as the relationships between matter and form suggest. [12] The Aristotelian and Scholastic distinction between art and nature was reconfigured during the seventeenth century in light of the "mechanical philosophy" (Dear 1995, p. 151). Absolute separation of the two agents was rejected by Francis Bacon, who argued that human art

[9] Aristotle, Misselden maintained, reduced "principles" of natural things to matter, form and privation, but he "excludeth Privation from the *Being* of natural things" (Misselden 1623, p. 11).

[10] As regards Aristotle's influence on Malynes and Misselden see Finkelstein (2000, chaps 2 and 3), and Magnusson (2015, p. 151). Also Barbon reused Aristotelian notions, like the distinction between natural and artificial goods (Finkelstein 2000, pp. 210-11).

[11] An argument in favour of this perspective is that mercantilists inherited the view according to which art subordinates nature (Herlitz 1997, p. 163), but – as explained later in this section – art, rather than being subordinate, completes what nature has left unfinished.

[12] The idea of an opposition between art and nature was prevalent in other periods. Dear (1995, p. 155) remarks that in Scholastic philosophy the opposition between art and nature rested on the idea that "The natural course of a process could be subverted by man-made, artificial causes, because art replaced nature's purposes with human purposes".

exploits but it is not radically different from nature (*Ibid.*, p. 155): "the artificial does not differ from the natural in form or essence, but only in the efficient" (Bacon 1623, p. 294). A similar position, but within an Aristotelian framework, was put forward by Misselden (1623, p. 9), when he maintained that the essences of natural and artificial things do not differ if considered in light of relationship between matter and form. Matter and form were viewed as distinct but coessential components of things, both in natural and artificial products, and Malynes, by following Aristotle like Misselden, pointed out that "artificiall riches" derive from "naturall riches" (Malynes 1601, p. 5). Others, like Barbon, pointed out that the "artificial" sphere, rather than being in opposition to the "natural" one is an extension of it. However, the conception of art and nature as distinct agents of change informed many debates (Dear 1995, p. 156), and persisted in the writings of Botero, Malynes, Mun, Barbon, Roberts, and Davenant, who adopted it to denote the empirical distinction between natural and artificial commodities.

In particular, Malynes recognized that the distinction between natural and artificial commodities is present in Aristotle (see *Physics* II, 192 b 8):

"Aristotle saith, that riches is either naturall or artificiall. The naturall riches as lands, vines, forrests, meddowes, and such like. The artificiall, as money, gold, silver, wooles cloth, and all other moveables and houshold stuff. Nowe as this artificiall riches is proceeding of the naturall riches, and that both these doe receive their price and estimation by money […] so reason requireth a certaine equalitie betweene the naturall riches of lands, and the artificiall riches of commodities proceeding of the same" (Malynes 1601, pp. 5-6).

The empirical evidence of natural products, as fruits spontaneously engendered by the earth, might have suggested that the earth-mother does not need the father for her natural processes. But the argument of nature's self-sufficiency as autonomous producer of goods was not used against the metaphor of labour and the earth as the father and the mother of wealth. On the other hand, Aristotle himself considered this argument, when he pointed out that *all* natural processes are characterized by male and female principles, also when they do not appear as distinct sexual features. In nature "some things come out of opposites (out of male and female), but others out of

one thing alone, for example plants and all those animals in which male and female are not distinguished and separate" (GA, I (A) 18 724b 10). Therefore, generation of seed in plants "is done through the coupling of male and female nature" (GA, I (A) 23 731a 25).

By 'artificial products' Mercantilists meant products of human activity, and the increase of wealth was conceived as the addition of "Art to Nature, [and of] our labour to our natural means" (Mun 1664, p. 193) [13]. However, two – relatively contrasting – features of the relationship between art and nature, i.e. art as imitation of nature and art as completion of nature, pointed out by Aristotle in *Physics*[14], were present in the seventeenth century. The idea of art as imitation of nature, widespread in classical antiquity since Plato and developed in manifold forms over centuries, especially in the Renaissance, suggests that art is subordinate to nature, because nature is the model for art (Close 1971). Nature, Hobbes maintains, is divine art, because it is "the art whereby God hath made and governs the world", and it is imitated by the art of man (1651, p. 7). Although, on the one hand, art is a copy of nature, on the other hand, art and labour - as in Petty's metaphor of labour as father, and land as mother - dominate over nature: nature is weak and its resources are scarce, and only labour and industry have the capacity to exploit and multiply them (*Ibid.*, p. 163).[15] After all, Hobbes' notion of the "state of nature", as a condition of conflict among men which must be governed by a social and political agreement, presupposes scarce resources, given that, if resources were unlimited, conflicts among men would be neutralized. By contrast, since resources are scarce, only the security and peace ensured by agreement among men can constitute a precondition for plenty (*Ibid.*, ch. 13).

The capacity of art and labour to overcome limitations of nature, which relates back to the Aristotelian view of art as completion and perfection of nature[16], was developed by authors of the

[13] Many authors share this perspective, from Hobbes (1651, p. 163) to Child (1694, p. 26).
[14] "Art partly completes and partly imitates the work of nature" (*Phys.*, II 199 a, 15, p. 357).
[15] Christensen (1989, pp. 704-5) remarks that Hobbes' view on relationships between nature and labour echoes the pseudo-Aristotelian *Oeconomica*, and that this perspective reappears in Petty and Cantillon.
[16] The argument "art ministers and perfects nature" was used by Aristotle and by Stoics, and it was a commonplace in the Renaissance (Close 1969). For Aristotle "nature and art are parallel creative processes" which imitate each other (Close 1971, p. 172). Cicero adopted the Aristotelian idea that art is "an indispensable fulfilment of nature", because it compensates for nature's deficiencies (*Ibid.*, p. 178). Similarly, for Plotinus art corrects nature (*Ibid.*, p. 180).

age of Mercantilism. Thomas Browne (1605-1682) maintained that art and nature are distinct forces which can construct the world in alternative ways, but art is "perfection of nature" (quoted in Johnson 1937, p. 260). The idea that art can improve nature is a recurrent theme in the seventeenth century: art gives form to matter, and "the forme giveth to the thing, the perfection of being" (Misselden 1623, p. 10. See also Malynes 1622, p. 500, and Roberts 1641, p. 63). Unlike the concept of art as imitation of nature, art as 'perfection' of nature conveys the idea that art is not subordinate to nature, but expands its power and work, also because - as Bacon points out - art reveals the secrets of Nature.[17]

Barbon, in *An Apology for the Builder*, maintains that «the earth by the arts of husbandry produceth ten times more food than it can naturally» (Barbon 1685, p. 11). "Natural wares" are multiplied by art, and "by Art [they] are Changed into another Form than Nature gave them" (Barbon 1690, p. 10). Therefore, art improves nature in both quantitative and qualitative terms, because it multiplies natural products and modifies their form. However, as the cause of such an improvement, the role of art can be further specified in relation to labour, since – as Petty maintains - art increases labour productivity by means of organization of labour and new inventions, and this poses the problem of discovering "a Par and Equation between Art and Simple Labour" (Petty 1691a, p. 182).

Powers of the earth exhibit two apparently contrasting dimensions. On the one hand, nature has limited powers as regards its capacity to give gifts; on the other hand, it has an infinite capacity to reproduce its "natural wares" through the perpetual cycle of seasons, from which limitlessness the "artificial wares" derives:

"The Native Staple of each Country is the Riches of Country, and is perpetual, and never to be consumed; Beasts of the Earth, Fowls of the Air, and Fishes of the Sea, Naturally Increase: There is Every Year a New Spring and Autumn, which produceth a New Stock of Plants and Fruits. And the Minerals of the Earth are Unexhaustable; *and if the Natural Stock be Infinite, the Artificial Stock that is made of the Natural, must be Infinite*" (Barbon 1690, pp. 10-11).

[17] The "secrets of nature reveal themselves more readily under the vexations of art than when they go their own way" (Bacon 1620, p. 95).

The earth's endless capacity for regeneration engenders an infinite "natural stock", from which an infinite "artificial stock" derives. However, the idea of infinity of natural stock, consequent on seasonal cycles, is not independent from the traditional idea that, since the banishment from the Garden of Eden, mankind has struggled against scarcity (Barbon 1690, p. 14). The "first Effects that the Fruit of the Tree of Knowledge wrought upon the Parents of Mankind was to make them cloath themselves" (Barbon 1690, p. 14). This not only distinguished humankind from animals but also introduced "the Mark of Difference and Superiority betwixt Man and Man" (*Ibid.*). A consequence is that in the present world men are subjected to "Wants of the Body and Wants of the Mind". "Wants of the body" depend on basic needs (food, clothing and shelter), while "wants of the mind" depend on desires – like the desire for distinction with respect to other men - and are "infinite". The "infinity of wants", from which an infinite demand ensues, has to be compared with the "infinity of supply", and although the notion of infinite supply was considered in many discussions on the earth's capacity to produce an infinite amount of agricultural goods thanks to the improvement in husbandry, as Plattes and Hartlib maintained (Finkelstein 2000, p. 122 and pp. 211-4), this perspective does not entail that the world is characterized by abundance: "the Influence of Heaven […] sometimes causes Murrains, Dearth, Famine" (Barbon 1690, p. 15), and since scarcity prevails and commodities are not always available, international trade satisfies needs engendered by the Wants of the Mind, i.e. "Fashion and Desire of Novelties, and Things scarce" (*Ibid*, p. 35).[18]

5. Locke between continuity and change

[18] Also Mandeville would associate the condition of man after the banishment from the Garden of Eden to human desires, and would point out that "Knowledge both enlarges and multiplies our Desires" (Mandeville 1723, p. 288). According to Hundert (1994, pp. 182-183), he incorporated some views of seventeenth-century pamphleteers, like Barbon, Petty and Dudley North, who were interested in concepts like desire, emulation, and imaginary wants, although he did not refer explicitly to them. Dudley North, in particular, pointed out that trade was a consequence of "exorbitant appetites" (North 1691, p. 27).

Commonplaces of the seventeenth century and new perspectives on the relationship between land and labour coexist in Locke's work. In chapter five of the *Second Treatise on Government*, the "spontaneous hand of nature" (Locke 1690, § 26) operates along with the hand of man (*Ibid.*, § 27): the hand of nature first creates and then donates, while the hand of man transforms what has been donated by nature. Labour and nature cooperate, but their capabilities are asymmetrical. In Locke, as in many other authors of his time, nature is weak, while labour multiplies products of the earth: "For the provisions serving to the support of human life, produced by one acre of inclosed and cultivated land, are […] ten times more, than those, which are yielded by an acre of land, of an equal richness, lying waste in common" (*Ibid.*, § 27). Labour – as for Barbon – not only multiplies natural goods but also changes their form and improves their quality. As concrete activity which produces use-value, it "puts the difference of value on everything" (*Ibid.*, § 39) because it provides "more useful commodities" (*Ibid.*, § 42, see §§ 40-43, cf. Vaughn 1978; Cohen, 1995, p. 175; Russell 2004, pp. 303-304), while "nature and the earth furnished only the almost worthless materials" (*Ibid.*, § 43). For this reason, like Petty and subsequently Cantillon, Locke addresses the problem of calculating the contributions of land and labour to the final product.[19] The union of land and labour, however, reveals an antagonist element. Human labour denaturalizes matter: he who collects water from a fountain and puts it in a pitcher "hath taken it out of the hands of nature" (*Ibid.*, § 29). Labour cooperates with, but at the same time opposes, nature because the hands of man take something away from the hands of nature, and this subtraction constitutes the source of legitimacy of property rights (see Boyd 2016, pp. 398-403). The simpler labour process, like picking an apple, entails the passage from the state of nature and natural commons to private property. Man

"removes out of the state that nature hath provided, and left it in, he hath mixed his *labour* with, and joined to it something that is his own, and thereby makes it his *property*. It being by him removed from the common state nature

[19] "I think it will be but a very modest computation to say, that of the *products* of the earth useful to the life of man nine tenths are the *effects of labour*" (Locke 1690, § 40, emphasis in original).

hath placed it in, it hath by this *labour* something annexed to it, that excludes the common right of other men" (*Ibid*., § 27, emphasis in original).

By transferring to the matter something intrinsically personal through labour, man changes the identity of natural objects. This change of identity of natural goods refers not to the ability of labour to transform matter (picking an apple does not change the form of the apple), but to a less tangible ability of labour to transfer to it "something that is [man's] own" (see Boyd 2016, pp. 398-399). Therefore, labour denaturalizes the matter, and circumscribes a domain – private property – in which nature does not intervene, although wealth continues to be seen as the result of cooperation between land and labour.

This union, in particular, is conceived in terms of the dominion of labour over nature, especially when the subject of appropriation is land:

"God and his reason commanded him [man] to subdue the earth, […], and therein lay out something upon it that was his own, his labour. He that in obedience to this command of God, subdued, tilled and sowed any part of it, thereby annexed to it something that was his *property*" (*Ibid*., § 32, emphasis in original)

The union between labour and nature (the "common mother of all") which generates new and numerous products is characterized by the predominant position of labour, since "subduing or cultivating the earth, and having dominion, […] are joined together" (*Ibid.*, § 35).

6. Cantillon: towards a reformulation of the relationship between land and labour

The view of the economic system that Cantillon presents in the *Essai sur la nature du commerce en général*[20] is generally considered to be an anticipation of the physiocratic approach, since it delineates a hierarchic model of society based on expenses of the prince and landowners, where agricultural surplus is a concept better defined than in Petty's, Barbon's, and Locke's works.

[20] The book was written in the early 1730s but not published until 1755.

Many studies since Schumpeter's *History of Economic Analysis* have discussed the connection between Cantillon and Quesnay, and Aspromourgos (1996, p. 73) has defined Cantillon's work "the theoretical bridge between the seventeenth-century English economics and French Physiocracy". Thornton (2007) argued that Cantillon was an antimercantilist in many respects, and Benítez-Rochel and Robles-Teigeiro (2003) pointed out that Boisguilbert influenced Cantillon, and that both provided "the basic principles of the *Tableau Economique*" (*ibid.*, p. 232). In particular, Boisguilbert, Cantillon and Quesnay shared the opinion that the earth occupies a dominant place in the economy (*ibid.*, p. 235). This point is important because, in this line of thought, interpretation of relationships between land and labour began to change, and Physiocracy in particular considered land and not labour as the main cause of production of wealth.

The opening words of Cantillon's *Essai* reproduce Aristotelian topics:

"The Land is the Source or Matter from whence all Wealth is produced. The Labour of man is the Form which produces it: and Wealth in itself is nothing but the Maintenance, Conveniencies and Superfluities of Life" (Cantillon 2015, H3).

Land is defined as "source or matter", but the meaning of the term "source" is not explained, and this expression is used only in this circumstance, while elsewhere in the *Essai* land is qualified simply as "matter" (*Ibid*. H75). However, for Cantillon, land is not simply inert matter, because it produces "overplus" (*surplus de produit*) (*Ibid*., H13, E13), and exhibits different degrees of fertility which determine the quality of its produce (*Ibid.,* H68-H70).

Labour "gives form of wealth" to products of the earth, and its main feature consists in transforming natural objects (*Ibid.,* H4), and in multiplying goods (*Ibid*., H438). Moreover, it is characterized by different degrees of "skill": the country labour of a young son of a husbandman requires "no art or skill" (*Ibid*., H41), but if he learns a trade his labour changes qualitatively in consequence of the learned skill.

Quantity and quality of both land and labour enter into the explanation of "intrinsic value" as costs of labour and raw materials employed in production (Brewer 1992, p. 63; Aspromourgos

1996, p. 81) and are expressed in money (Cantillon 2015, H103). However, the reduction of intrinsic values to costs of production is the consequence of a long reasoning process. In particular, the intrinsic value of a commodity is "the measure of the quantity of Land and of Labour entering into its production, having regard to the fertility or produce of the land and to the quality of the Labour" (*Ibid.*, H70). It should be reckoned by considering quantity and quality both of land and of labour, but this calculation can be simplified because: 1) quantity of labour – or more precisely subsistence of labourers – can be expressed in terms of quantity of land, 2) it is not necessary to refer to the quality of land and labour. As regards the first point, it is sufficient to calculate quantities of land and labour by reducing quantity of labour to a certain amount of land. This reduction is possible because the value of labour is equivalent to the subsistence engendered by land necessary to maintain a "labouring slave" and his son, that is, twice the amount of land necessary to maintain one labourer. As regards the second point, Cantillon considers not different quality, but "ordinary goodness" of land prevalent in a given country (*ibid.*, pp. H88), while quality of labour is not evaluated, because Cantillon takes into consideration not labour, but the ordinary subsistence of labourers, i.e., subsistence socially, geographically, and historically determined, which in turn is calculated in terms of the land necessary to produce it. As a consequence, quality of land and quality of labour do not enter into his calculations. By this ingenious solution, Cantillon shifted the focus from labour, which as "form" is irreducible to the "matter", to the subsistence of the labourer, since only this latter is reducible to the amount of the land necessary for its production. In short, Cantillon still represents the rise of wealth as Aristotelian relationship between matter and form, but the distinction between these two terms proves to be unessential for the calculation of contributions of land and labour to the formation of wealth. This latter consideration, and the view which gives a privileged role to land in formation of surplus, contributed to changing the traditional perspective on the relationship between land and labour.

7. Mirabeau and the change of perspective

Mirabeau deemed that Cantillon's *Essai* was not in contrast with the traditional approach. He knew well and was influenced by this book, which was in his possession for many years before it was published, and which initially he probably intended to plagiarize (Cantillon 2015, p. 7; Sabbagh 2016, p. 95, note 20). The influence of Cantillon's *Essai* is evident in *L'ami des hommes* (1756), a work that Mirabeau wrote before meeting Quesnay, where he argued for the fundamental role of labour in producing wealth with respect to land: "man's food can only be extracted from the earth, the earth produces little or nothing which is ours, without the labour of man"[21] (Mirabeau 1756, p. 17).

This element helps to understand Mirabeau's reformulation of the famous sentence which opens Cantillon's *Essai*:

"Wealth is the food, conveniences, and pleasures of life. The earth produces it, and the labour of man gives it form. Landed property (*fonds*) and form are the earth and man. What is beyond? Everywhere, form is necessary for landed property (*fonds*) […] If man is nil, so too is the earth" (*Ibidem*, p. 34)[22]

Since, echoing Cantillon, "the earth is the matter and the labour is the form"[23] (*Ibid.*, p. 197), the central role of labour in producing wealth, and in giving form to the matter, explains why the population and its increase is so important for Mirabeau.

Quesnay perceived in Mirabeau's discussion on agriculture as fundamental for increasing the population some affinities with his theory, and invited him to Versailles in July 1757 to discuss their ideas (Théré and Charles, 2008, p. 12). This meeting, which marks Mirabeau's conversion to Physiocracy and the beginning of the collaboration with Quesnay, was described by Mirabeau in a letter sent to Rousseau in 1767, in which two points were emphasized. The first was the negative

[21] "La nourriture des hommes ne se peut tirer que de la terre; la terre ne produit que peu o rien qui nous soit propre, sans le travail de l'homme" (Mirabeau 1756, p. 17).
[22] "La nourriture, les commodités & les douceurs de la vie sont la richesse. La terre la produit, & le travail de l'homme lui donne la forme. Le fonds & la forme sont la terre & l'homme. Qu'y a-t'il par-delà? Par-tout la forme est nécessaire au fonds […] Si l'homme est nul, la terre l'est aussi" (*Ibidem*, p. 34).
[23] "[L]a terre est la matière, & le travail est la form*e*" (*Ibid.*, p. 197).

judgment on Cantillon, who adopted the erroneous opinion widespread in the seventeenth century that trade is the "principle of wealth" (Rousseau 1932, p. 176). Before meeting Quesnay, Mirabeau shared Cantillon's approach and, as he himself admitted, this implied that some mistakes in his 'populationist' thesis derived from the influence exerted by Cantillon's book (Meek 1962, p. 16). The thesis was that "the labour of man alone possesses the capacity to increase wealth", and consequently the only way to increase prosperity consists in increasing population and productive labour (Rousseau 1932, p. 176, partially translated in Meek 1962, pp. 17-18). The second point was that Quesnay reacted by reversing this perspective and positing nature as the term from which any reasoning on production of wealth had to start (see also Mirabeau 1763, p. 103), because labour without nature could never begin (Banzhaf 2000, p. 520).[24]

This change of perspective would appear clearly in *Philosophie Rurale* (1763), a book written in collaboration with Quesnay (Théré and Charles, 2008), where land (*la terre*) is described not simply as the matter shaped by labour, but as the "source of production" ("source de la production") (Mirabeau 1763, p. 6). This reversal regards also the relationship between matter and form, a terminology still present in *Philosophie Rurale*: "In vain one has argued that [the sterile class] produces the form; to produce the form is to produce nothing" (*Ibid.*, p. 6, translated in Herlitz 1997, p. 173). The form in the strict sense cannot be produced because only nature produces, while artisanal labour simply gives shape to what has been engendered by nature. As a consequence, the roles of nature and labour in producing wealth have to be re-interpreted in this perspective.

8. Nature and labour in Quesnay's approach

Mirabeau's change of perspective synthesizes the reversal that occurred within the approach that conceived discourse on nature as a part of the economic discourse. This change preluded the

[24] Cantillon (2015, part I, ch. 15) maintained that subsistence determines population; nonetheless Mirabeau blames Cantillon for neglecting that wealth and subsistence depend on nature.

definitive abandonment of the Aristotelian relationship between matter and form, also as a union of land-mother and labour-father, because the view of nature as a domain ruled by its own laws, in which reproductive processes occur independently from labour, acquired increasing salience. Labour is not an element of natural processes; rather, it helps and directs natural reproductive processes.

The idea that nature is the framework in which reproductive processes occur and have an impact on economy was present in Linnaeus, who developed a theory in which natural sciences and economics are components of the same theoretical framework that he named "Economy of nature" (Rausing 2003, p. 184). In nature, where cyclical processes of "propagation, preservation and destruction" occur, there are no scarcities because the Creator has "established the minimum and maximum rates of reproduction for every plant and animal" which guarantees "a full abundance to all" (Worster 1977, pp. 35-6). Economics was viewed "as the discipline of how to husband the natural world and, in doing so, order society on nature's model" (Rausing 2003, p. 185). Although Linnaeus' approach to economic issues was influenced by cameralism and mercantilism (Koerner 1999, chap. 5), his theory is comparable to the physiocratic one in some respects. According to Rausing (2003, p. 177), the Swedish school of economics to which Linnaeus belonged "in its emphasis on farming, […] foreshadowed, even if it did not influence, the French physiocrats of the 1750s" (2003, p. 177). And Müller-Wille (2003, pp. 166-7) maintains that similarly to Quesnay "Linnaeus was one of the first to have identified circulation as a form of biological reproduction", and that it "seems probable that Quesnay knew the work of Linnaeus and other naturalists of his time". The idea of reproduction of living beings played an important role in Linnaeus' theory on continuous renewal of nature, and it was shared by many studies of his time. Investigations into the sexuality of plants appeared late in the seventeenth century, although the analogy between animal and plant sexuality was fully developed in the first decades of the eighteenth century (Schiebinger 1993, pp. 11-39). Linnaeus' system, which was widely adopted after 1737, is an example of this kind of approach:

"plants produce seeds, but they are entirely unfit for propagation, unless fœcundation precedes, which is performed by an intercourse between different sexes, as experience testifies. *Plants* therefore must be provided with *organs* of generation, in which respect they hold an analogy with *animals*" (Linnaeus 1749, p. 59, emphasis in original).

Although this argument was not new, given that also in Aristotle nature is ruled by male and female principles (see sect. 4), it acquired importance in consequence of its inclusion within the conceptual framework of the economy of nature.

The view of continuous renewal of nature was adopted also by Quesnay, who - in *Essai physique sur l'œconomie animale* – like Linnaeus developed the analogy of sexual reproduction between plants and animals: as "the prolific liquor of the Animals, is provided with animacules that fertilize eggs (*oeufs*)[25] so "the liquor of the powder (*liqueur de la pouissière*) of the Stamens of the Flowers also contains the germs which fertilize the seeds (*semences*)"[26] (Quesnay 1747, p. 156), where the "liqueur prolifique" and the "liqueur de la pouissière" come from male, while the substance of "oeufs" and "semences" come from the female.[27]

The idea of expansion of nature as consequence of its cyclical renewal, from which abundance derives, influenced Quesnay's economic approach. "Fertility of the land" is at the basis of cyclical reproductive processes, both natural and economic (Quesnay 1766, p. 209), and the "produit net", as physical surplus cyclically reproduced by nature, determines surplus generated by the market as the difference between costs and revenues (Banzhaf 2000, pp. 518-523). However, analysis of the passage from nature to the market requires investigating the specific features of these two domains. The notion of "goods" (*biens*), which refers to the production (and reproduction) of nature as a

[25] "[L]a liqueur prolifique des Animaux, est fournie d'animacules qui fécondent les oeufs" (Quesnay 1747, p. 156).
[26] "[L]a liqueur de la pouissiere des Etamines des Fleurs contient aussi les germes qui fécondent les Semences" (*Ibid.*, p. 156).
[27] From the 1740s onwards, in consequence of more accurate observations of animal generation, due also to the use of microscopes, nature appeared to be characterized by distinctive vitality and creative capacity. Theories of pre-formation and pre-existence, which maintained that the embryo pre-exists and that nature is deprived of vital powers because all organisms were originally formed at the time of Creation, were rejected. Also mechanical philosophy, which reduced biological phenomena to mechanical-physical phenomena, declined. By contrast, epigenesis – the theory of gradual development of the embryo - reappeared along with vitalism. In these perspectives, life is not inert matter reducible to mechanical and motion laws. However, the transition from theories of preformation to vitalism was gradual, and both the views often coexisted and influenced each other (Bernardi 1980, pp. 14-21).

process independent from the market, although sometimes confusedly, had to be distinguished from that of "wealth", since wealth arises from the market and not from nature[28]: "Without trade, productions would be only goods and not riches, and without the productions of the earth, commerce would procure neither goods nor riches"[29] (Mirabeau 1763, p. 142). Only sale transforms goods into wealth which exhibits "valeur vénale" (*Ibid.*, p. 337).

If nature embodies the capacity for reproduction, labour assumes two distinct features: 1) activity of direction of nature's forces, 2) transformation of natural matter. In regard to the agricultural sector, man is a midwife (Tribe 1978, p. 96), that is, a help that from outside favours the rise of natural goods, since "labour directs but nature produces" (Mirabeau 1763, p. 93, translated in Herlitz 1997, p. 173).[30] The direction of nature is not limited to peasant labour, but involves a more complex activity of administration and management of rural property. It is an activity usually performed by the farmer, who decides how to exploit natural resources, and plans his investments (Quesnay 1757, pp. 479-484). These processes reduce the possibility to view labour simply as a "father", because labour does not participate in natural reproductive processes, because renewal of nature depends on expenditures not directly related to labour, which increase productivity of land, and because factors other than direct labour help nature to be more productive. As regards the latter point, human labour is not the only force which favours nature's productivity, because other natural forces perform this function irrespective from man: "Independently of the direction given by the employing hand, draught-animals have within themselves a motive force which gets them going and duplicates our impulsion" (Mirabeau 1763, pp. 92-93, translated in Herlitz 1997, p. 173). This entails revising the old idea that labour represents the capacity to multiply goods. Labour alone is unable to produce increasing wealth without support: "If a man cultivates the land with his hands, he will derive from it only his subsistence and that of his family, and will indeed live very poorly"

[28] This distinction was not always so clear, because the term "wealth" was often used to denote effects of both natural and market processes.

[29] "Sans le commerce, les productions ne seroient que des biens & non des richesses, & sans les productions de la terre, le commerce ne procureroit ni biens ni richesses" (Mirabeau 1763, p. 142).

[30] "[L]e travail dirige, & c'est la nature qui produit" (Mirabeau 1763, p. 93).

(Mirabeau 1973, p. 121). By contrast, "he must find a form of assistance which will furnish him with a larger product, and demand less from him by way of upkeep", where this "assistance consists of machines, livestock, wheat, manure" which require "the mass of the original advances [*avances primitives*]" (*Ibid.*, p. 121).

The role of labour, as a complex activity of direction and management and as physical work, consists in combining material produced by nature:

"We have to distinguish an *adding together* of items of wealth which are combined with one another, from a *production* of wealth. That is, we have to distinguish an increase brought about *by combining* raw materials with expenditure on the consumption of things which were in existence prior to this kind of increase, from a *generation* or creation of wealth, which constitutes a renewal and *real* increase of renascent wealth" (Quesnay 1766, p. 207, emphasis in original)

The "*generation* or creation of wealth" depends on nature, while the combination of pre-existing matter depends on human activity. But combination as the transformation of pre-existing matter is what characterizes industrial and artisanal labour (*Ibid.*, p. 208), that is, the kind of labour that physiocrats named "sterile", a metaphorical term which emphasises that labour cannot be the "father" of wealth. Moreover, the role of labour lost the feature of "father", because creation of wealth within the sphere of the market depends not on physical features of human activity, but on investments. This story can be narrated in reference to the emergence of the concept of capital. While Petty's and Cantillon's consideration of land and labour as exclusive agents of wealth production reflects the persistence of the concepts of matter and form, Quesnay's introduction of the notion of capital (as *avances primitives* and *avances annuelles*) reflects increasing abandonment of that view (Aspromourgos 1995, pp. 116-123, Magnusson 2015, pp. 103-106). In conclusion, the two traditional features of labour pointed out in the seventeenth century – i.e., capacity to multiply and change the form of natural products – were revised, because multiplication of natural products does not depend only on labour, while the change of form should not to be confused with the generation of natural products.

Although some metaphors about the relationships between nature and labour decayed, the metaphorical language of organic generation, in different forms with respect to the past, continued to be used to describe reproductive processes of wealth. Land was viewed as "the mother of all goods" (Mirabeau 1973, p. 120) which embodies a generative capacity and "gives birth" to surplus, thanks to its "fecundity" (or "fertility"). Labour in agriculture was described as (re)productive because it facilitates the reproductive processes of nature, while in the industrial and artisanal sector it was defined as "sterile". Similarly money was considered as "sterile" wealth.

9. Conclusions

Within the approach which considered nature to be an essential part of economic discourse, in the seventeenth century and in early decades of the eighteenth, there occurred a conceptual reversal regarding the relationship between land and labour as agents of production of wealth. Mercantilists attributed to labour the capacity to produce wealth and considered land as matter, while physiocrats attributed reproductive capacity to land, and viewed labour as either mere support of reproductive processes or a useful, but sterile, capacity to transform natural products. These perspectives emerged not only from theoretical analyses but also from less structured conceptions in which metaphors played a role for their capacity to provide preliminary conceptual frameworks. In this regard, because an overall theory about the rise of wealth was not available, they oriented inquiries, and constituted tools with which to explore economic phenomena. Despite their differences, these views can be interpreted as reorganization of ideas, those of matter and form, that dated back at least to Aristotle, and that were subject to many reformulations especially in the culture of the seventeenth century. These Aristotelian concepts were recombined and interacted with concepts deriving from alternative, more modern, approaches. Even Bacon reused them, although he was an anti-Aristotelian philosopher. They were not outright commonplaces, because they were reused to

answer a question that was not posed by Aristotle, but became relevant in the seventeenth and eighteenth centuries: the rise of wealth in modern, commercial, societies. The notions of "matter" and "form" were re-contextualized in the age of Mercantilism, and also when they were scarcely mentioned, as in the physiocratic approach, they influenced the image of the relationship between land and labour.

According to Lovejoy (1936, p. 14), an old term generally accepted for one of its meanings can embody "other meanings or suggested implications, not clearly distinguished by those who employ it", which "gradually become the dominant elements of its signification" within new contexts. Something like that happened for the view of living nature – of which the vegetable kingdom is part – as governed by male and female principles. This view, accepted since Aristotle (see sect. 4), became particularly important in Physiocracy, where nature is the domain in which reproductive processes occur (sect. 8), while it was not emphasized by the mercantilist approach, whereby female and male features were attributed respectively to the earth and labour. This change of perspective implied, among other things, that in Physiocracy the earth changed metaphorical meaning and was considered as a prolific, rather than ungenerous, mother. This argument was not new, because the earth, as *living* nature in which cyclical processes of reproduction occur, was never seen as inert matter[31]. For example, Barbon stressed the capacity of nature to infinitely reproduce resources, although this capacity was not able to satisfy the "infinity of wants" of man. But, unlike Physiocracy, in mercantilism the old idea of renewal of nature was not related to that of abundance. Therefore, cyclical renewal of nature meant cyclical reproduction of scarce resources.

Also metaphors associated with labour were reorganized over time, and changed their meanings. The Aristotelian view of labour as "source of movement" and "father" which gives form and life to passive matter influenced Western thinking for centuries. It was reused to explain the rise of wealth in the seventeenth century, in ways which modified Aristotelian conceptions. However, in the eighteenth century labour ceased to be viewed as "father" and "form" which determines

[31] The concept of inert matter rather regarded physical features of things like wood or stone which can be transformed by labour.

"essence" of things; and as transformative activity, it was qualified as "sterile". In addition, it ceased to be considered as an intrinsic part of natural reproductive processes, and its function was viewed in terms of external help to and direction of those reproductive processes. In short, the metaphor of sexualisation ceased to describe the relation between land and labour, and was used to define only features of the natural sphere.

The alternative analyses of relationships between land and labour formulated by mercantilists and physiocrats were components of economic discourses not separate from discourses on nature, and this perspective constituted their common denominator. Although it can be debated when economic theory was denaturalized, elements that would lead to the rise of economic theory as an autonomous discourse can be detected in the period examined in this paper: from Locke's theory of the rise of private property to Quesnay's idea that analysis of formation of wealth includes the notion of capital. The denaturalization of economics was a long process and at least partially regarded the decline of the conceptual couple of "matter" and "form".

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