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Analysis

Focus: (Re)productivity

Sustainable relations both between society and nature and between the genders

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ABSTRACT

The paper is embedded in the multiplicity of discourses concerned with a viable, sustainable development of society and its economy. It makes a case for a mode of economic activity geared to systematically integrating production and reproduction processes. Its starting hypothesis is that the persistent, constantly changing and expanding crises that weigh so heavily on modern societies – above all the ecological crisis and the crisis of reproductive work – have their common origin in the separation of production from reproduction constitutive for industrial modernity. A reformulation of the category of (re)productivity – the idea of the unity of and at the same time the distinction between production and reproduction in the economic process – could set the stage for us to review today's crisis phenomena, relocalize problems, and in this way to develop new solutions for them. A sustainable society would be in a position to grasp, and shape, the economy as a (re)productive regulative system, with economic space constituted consciously as a socioecological action space.

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1. Introduction

Ever since the debates on ecological and sustainable economic activity got underway, feminist economists have been pointing to the “blind spots” of established economic theory. Based on the multiplicity of studies that have appeared in the field, they have repeatedly emphasized that what is needed to ground a “sustaining production theory” (O'Hara, 1997) is a concept of labor broadened to include caring activities (Jochimsen and Knobloch, 1997). Sustainable economic activity needs a “high-reliability economics” (Nelson, 2008) keyed to preserving and improving the chances people – including future generations – have to live a good life.

Our approach to building on these discourses involves bringing together the core hypotheses of feminist and ecological economic theory to form the category of (re)productivity. Our guiding hypothesis here is that it is the structure of separation between the productive and the reproductive that has given rise to the present socioecological crisis situation. The fact that we do not live sustainably in the present is the immediate consequence of a reductive theoretical conception of matters economic and the false economic practice this has entailed. A mode of economic activity for which the principle of care is extrinsic will necessarily prove unable to preserve and regenerate the ecological and social foundations on which it rests

(Jochimsen and Knobloch, 1997). As O'Hara (1997, 142) puts it, “Instead sustaining production implies production which sustains the social and biophysical context within which it takes place.” She concludes that it will be necessary to (re)integrate production into its social and ecological contexts, in this way (re)defining social and ecological boundaries. We adopt a somewhat different approach here, one that views production as the praxis inherently involved in mediating between human and natural processes. We in this way develop a processual, preservation- and regeneration-oriented concept of productivity – that is, a productivity that encompasses the regenerative forces of the animate world, the so-called reproductive functions. Building on these reflections, we go on to develop the category of (re)productivity. An economic theory that includes (re)productivity as one of its core categories is, we will argue, a necessary component of the “high-reliability economics” called for by Nelson (2008).

We will start out by demonstrating that the cleavage between productivity and “reproductivity”² pervades the whole of the history of economic theory – indeed, that it has, from the 18th century to the present, become entrenched, and even expanded in scope (Section 2). Yet there have always been “other voices,” voices articulating

² We use the term “cleavage” to refer to the systemic, noncontingent separation between “productive” and “reproductive.” It is, as we show, justified by the theoretical self-conception of economics and is constantly re-created by economic praxis. Its basis must be seen in the hierarchical dualism that has shaped modernity since Descartes, and that has been repeatedly exposed and criticized by feminist theory (see e.g. Jennings, 1994, 1999; Weinreich-Haste, 1986). Our concept, focused on economic structure, builds on these debates.

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resistance to this cleavage, and they have, in recent years, become more emphatic, taking on increasingly distinct contours in debates on both feminist and ecological economics (Section 3).³ Building and following up on these debates, we develop a concept of natural productivity (in lieu of “natural capital”) (Section 4). It in turn, together with the category of (re)productivity, has enabled us to map out a perspective of sustainable economic activity as one rooted in the unity of transformation and regeneration (including renovation) in the economic process (Section 5). In the final section we present and discuss our conclusions.

2. Genesis of the structure of cleavage: productivity and “reproductivity” in the history of economic theory

The point of departure for what follows is a critical review of how the concept of productivity evolved in the history of economic theory. The key to the evolution of the concept must be sought in the writings of Adam Smith. One of his central categories is “productivity.”

When Smith speaks of “the productive powers of labour” (Smith, 1937, 3), he is referring exclusively to market-coordinated, commodity-producing labor, and he explicitly excludes from it the multiplicity of feminine, caring, “reproductive” work performed in society. For Smith, productivity is gauged in quantities of commodities produced per worker, and rising productivity finds expression in an increasing quantity of commodities. This increased quantity of commodities thus represents more natural substance. The latter's source of productivity remains in the dark. Indeed, the productivity of nature appears under the guise of the productivity of labor (Immler, 1985, 148). Nature, according to Smith's labor theory of value (see Smith, 1937, 28), materially transformed into use value, assumes the form of the commodity and is, accordingly, regarded as value in exchange, the product of labor. It is value in exchange alone that counts in the process of market exchange. Here economic theory becomes the theory of market processes, of value in exchange; it presupposes value in use only as the latter's material condition. Non-commodified nature, that is, nature that is not human property, has no place in this economic rationale, for any exchange of commodities presupposes owners of commodities.

In Smith's economic analysis, all elements of the so-called reproductive seem to have been severed off: There is no place here for any conception of such feminine, caring activities as labor, no conception of natural productivity. Smith affords us a glimpse of his notion of reproduction only in his concept of the “natural price,” the price, that is sufficient to cover all production costs, including a “natural” wage, i.e. a wage high enough to ensure the reproduction of the family (see Smith, 1937, 68). If, however, we look at the whole of the social process of production and exchange, in its reiteration, as a process of valorization, we cannot fail to see that Smith is unable to get along without both female and ecological productivity as stabilizing foundations of the free-enterprise system he outlines. He needs natural productivity to generate the materials and energies needed to produce commodities, and he needs activities carried out by women. These latter serve to ensure that future market actors learn, in the family, the moral standards they need to restrain their own self-interest in the market. For it is only with the aid of these

moral standards that the market can function in the long run (see Smith, 1976, Chapter I). However, Smith does not regard these women's activities as labor. Like the productive capacities of ecological nature, Smith simply presupposes women's activities as an unquestioned *sine qua non* of the market.

David Ricardo further refines Smith's theory of labor theory of value, taking it a step further. While Ricardo retains Smith's twofold conception of value, and thus the material basis of value-based economic thinking and production, his theory severs the loose links between the economy and women's reproductive activities and the role they play in instilling moral standards for the market: the picture he sketches of the “*homo oeconomicus*” qua market actor is the picture of a selfish individual whose actions are geared to maximizing his own utility. This *homo oeconomicus*, as this market actor was later to become known,⁴ is in no way socially integrated. For his reproduction he can get along quite well without women's activities. One last remnant of the significance of reproductivity may be glimpsed in the category of the “natural wage” that Ricardo borrows from Smith. As in Smith, production is understood to mean production of commodities for the market based on wage labor. Productivity is measured in terms of output of commodities per worker.

But there is a new stance vis-à-vis the “reproductive” processes in Ricardian theory – a relationship to nature, with nature cast in the role of a limiting factor. In his theory of the land rent (see Ricardo, 1962) Ricardo defines this factor as the differential rent accruing to the landowner. In it we catch a glimpse of natural productivity in the guise of different grades of soil fertility. Over the long term Ricardo predicts a growing demand for food on the part of the population. To produce these vital goods, he argues, it is necessary to develop new, and increasingly marginal land. The increased labor inputs required for such land in turn leads to rising food prices, and this in turn increases the land rent accruing to the owners of better-grade land. At the same time, this raises the natural wage. The consequence is falling profits and stagnation of accumulation. Here natural productivity assumes the character of a barrier to capitalist development.

The labor theory of value is as if it were perfected by Karl Marx in his *Critique of Political Economy* (see Marx, 1971). Marx here dialectically reconceptualizes the labor theory of value, no longer viewing use value and exchange value only as two sides of a commodity but noting instead that they bear within themselves a number of antagonistic contradictions that ultimately lead, in developed capitalism, to a preponderance of exchange value over use value. Marx asserts that all production processes are at once material processes and valorization processes, organized exclusively under the perspective of capital valorization. Productive labor is wage labor that serves the interest of capital valorization and generates surplus value. The productivity of labor now appears under the guise of the productivity of capital. Productivity is measured in terms of exchange value, as a value relation, as a profit rate, which serves to place the surplus value created by unpaid labor in relation to advanced capital.

Based on a concept of labor that views work as a metabolic process between man and nature (see Marx, 1971, 192), Marx shows that the form in which this process is organized in capitalism is a process of valorization. In keeping with the dictates of valorization, workers, both men and women, are ineluctably drafted into this process, in order then to be discharged into the industrial reserve army. Marx (1971, 670ff.) refers to this as the “absolute, general law of capitalist accumulation.” He emphasizes here that the supply of and demand for labor depend not on separate factors but solely on the movement of capital. The process of capital reproduction in this way creates the

³ In both Part 2 and Part 3 we build on numerous studies devoted to the history of the theory. Much of what we emphasize here is hence known. Still, we do need our own historical-theoretical outline here. For our concern is to demonstrate that the structure of cleavage is anchored in the economics of industrial modernity and serves *equally* to marginalize the social work performed by women and ecological nature. And what that means in effect is: banishing the whole of what is known as the reproductive from the knowledge and the praxis of the economic. What both the feminist discourse on the future of work and the ecological discourse articulate as critical positions are no more than one aspect of what we refer to here as the “reproductive.” Referring to, and bringing together, these two discourses, enables us to analyze and reflect critically on the equiprimordial marginalization they share.

⁴ Since Hartfiel's (1968) study on images of human nature in economics and sociology, Ricardo has been regarded as the father of this economic figure. (No mother is known, though.)

labor it needs, and it in fact appears to disconnect from female productivity.

Female productivity has no role to play in Marx's writings, either. The "housework debate" and other, more constructive discourses in the field of feminist-economic theory formation (see e.g. Hoppe, 2002)⁵ have shown that Marx himself did not regard so-called reproductive activities as labor, that is, that here, too, the role played in production by women's productivity is simply uncritically presupposed. Some traces of these activities are detectable in Marx only in the value of the labor needed to replace worn-out and discarded manpower, and he does not regard them as productive. But he does note critically that, as it develops, the capitalist process of valorization destroys its own foundations – "the earth and the worker" (Marx, 1971, 530). Marx, too, failed to see that this goes in particular for the "reproductive" (see Section 5).

In the concept of the use value, though, the labor theory of value continued to bear – even after its ties to women's productivity had been severed once and for all by the figure of the homo oeconomicus – a relation to the natural materials on which capitalist commodity production is based. The new value theory breaks even these ties, with its philosophy, utilitarianism, becoming entrenched as the philosophic base of the new economic theory. Far from remaining the (objective) property of commodities defined by the labor spent in the production process, value is now seen as arising from the interplay of subjective appraisals: commodities are regarded as a set of utilities whose usefulness is judged in terms of subjective notions of utility, and which, accordingly, command a certain price in the market. The goal of economic activity is individual utility maximization.

Production is now production of units of utility, based on factors of production. Labor is merely one factor, alongside capital and land. As a factor, labor continues to mean only commodity-producing labor. Even though Alfred Marshall referred to women's household work as "the most valuable of capital" (see Kuiper, 2001, 141), "...women are not considered by Marshall to be economic human beings" (Pujol, 1992, 139). Production is geared solely to markets. The individual goal is profit maximization, the goal, in terms of society as a whole, is an efficient allocation of factors of production based on competitive markets. The scientific method comes to the fore in the observation of marginal changes, not of stocks. The new theory was later to become known as neoclassical economics (for an outline of the history of the terminology involved, see Eatwell et al., 1987, 625).

This focus on utility can be explained with reference to the – then – new science of thermodynamics (see Skourtos, 1994). Like the classical field of political economy, neoclassical economics claims to approach its object using the methods of the natural sciences. If Newton's mechanics served as the scientific basis for the work of Smith and Ricardo, early neoclassical economics explicitly sees itself in the context of thermodynamics, the core of which is the first law of thermodynamics. It states that, in a closed system, neither mass nor energy can be created or destroyed, they can only change their form. This model is now applied to processes of production and consumption; in them no energy can be lost. The factors of production are interpreted as energy potentials – like nature, which is viewed as homogeneous and constant. Conservation and regeneration of nature are not the concern of economics.

The new theoretical framework in this way severs all ties to productive female activities and ecological services, which still showed through in Smith's writings. Morality no longer has a role to play here, since the only "morality" known to the homo

oeconomicus is maximization of utility. There is no more room here for the family work performed by women. And the subjective value theory used here severs any and every connection to the concrete materiality of the produced commodity. By transforming production and consumption into utility-creating flows of goods and services, economic theory seems finally to have emancipated itself from any kind of natural substance. In this way the marginalization of nature that begins with Smith reaches its nadir in a systematic disregard of nature.

The dichotomization of productivity and "reproductivity" is now complete – and female and ecological productivities have been dissociated from the economic. This seems at the same time to have led to the construction of the autonomous economy. Conservation and regeneration of basic productive functions that have now come to be seen as "reproductive" can no longer be part of the goal system of an economy geared primarily to efficiency.

However, the appearance of the socioecological crisis phenomena to be observed roughly since the 1970s has driven on the process of construction, and now one main concern of such efforts is to use neoclassical theory as a means of economizing female and ecological productivity by integrating it into the efficiency logic of the neoclassical model. This can be observed, on the one hand, in the new household economics (see Hoppe, 2002; Wolf, 1996), which deals with the family as a "small factory," applying to it the same efficiency rationale it uses for the business enterprise (Becker, 1976). And it is found, on the other hand, in neoclassical environmental and resource economics, where the costs of environmental damage and avoidance of such damage are monetized as a means of coming up with an optimal degree of environmental pollution as a yardstick for environmental protection measures (see Cansier, 1993; Frey, 1972). The optimality criterion is and remains that of the homo oeconomicus – maximization of the utility of market actors. This optimum has nothing to do with the conservation, protection, or indeed regeneration of productive ecological resources.

Neoclassical economic theory was to become the dominant theory in the Anglo-Saxon world in the 20th century as well as in the German-speaking world after the Second World War. Keynesian economics was to be integrated with the latter in what has become known as the neoclassical synthesis (see Eatwell et al., 1987, 634). Keynesianism has at the same time played an influential role, serving in particular as a basis for sociocritical theory. It is at the root of the concept of the ecosocial market economy, a concept that has served as a social and ecological corrective to purely market-driven outcomes. However, it too has failed to integrate productive female and ecological activities into the dominant economic paradigm. The lines of cleavage rooted in Smith and cemented in neoclassical theory remain firmly entrenched.

3. "Other voices": resistance to the structure of cleavage between productivity and "reproductivity"

The evolution of theory does not follow a clear-cut course. There are, and have been, other voices arguing in favor of another, socioecological direction. One theory of this kind – that even preceded Adam Smith – may be seen in physiocracy, which saw in the productivity of land the basis of all economic activity, assigning labor productivity the role of a cofactor. For the physiocrats, the earth is the sole source of wealth, and this basic conception gave rise to a theory of natural value that ascribes the process of value creation to the forces of nature, and above all to the fertility of land. Nature produces, man lends a hand. This is why the conservation of natural productivity, above all of soil quality, plays such an important role here; production and reproduction are viewed holistically. If this theory had been further developed in keeping with the evolution of modern civil society, the history of theory might have taken a different course, one grounded in (re)production theory.

⁵ And the housework debate also clearly indicates that the opposition between paid and unpaid work discussed and critiqued in it is a reflection of the separation of private and public in economic theory, which is rooted in Cartesian dualism (for one representative example, see Pujol, 1992, 23). It is in this way that this specifically feminist-economic discourse has become embedded in the comprehensive discourse on feminist science and methodology.

The transition from classic political economy to neoclassical economics was also accompanied by other voices that addressed both female and ecological productivity. Two exemplary figures here may be seen in John Stuart Mill and Harriet Taylor Mill, his wife. While, politically, they fought together for an autonomous role for women as economic actors (see [Mill and Taylor Mill, 1976](#)), Mill was, in his theoretical analyses, unable to accept “reproductive” activities as productive labor (see [Mill, 1965, 40](#); [Pujol, 1992, 31](#)).

But this may serve at least as an indication of a possible alternative development of theory, including a theory of ecological nature. In contrast to his predecessors, Mill outlines a positive stance on a course of development headed for a growthless “stationary state” focused no longer on wealth but on redistribution and on cultural, moral, and social progress. Mill expresses his hope that this phase of development will materialize before nature in its entirety is harnessed to the end of wealth production (see [Mill, 1965, 756](#)). He depicts nature as benign, agreeable, aesthetically pleasing. All the same, Mill views nature in terms not of its productivity but its role as a boundary, a limiting factor. For Mill this has positive connotations.

In the 20th century we also find “other voices” calling on us to recognize the need to conserve the foundations of productivity. One particularly interesting approach here is that developed by John Hicks. He defines income as the maximum amount that can be consumed without reducing capital stock ([Hicks, 1948, 172](#)). The only impact this has had thus far on national income accounting is that the method presently used to calculate net national product involves deducting depreciation on invested capital from aggregate value added. [Costanza et al. \(1998\)](#) point out that two adjustments would be needed to do justice to Hicks' definition of income: allowance for “depreciation on natural capital” and inclusion of the incidental effects of human production, expressed in “defensive expenditures” such as those for police forces or protection against corrosion stemming from acid rain (see [Costanza et al., 1998, 122](#)).

“The American or old institutionalism” offers an interesting framework for the development of socioecological theory. It focuses on institutions, i.e. habitualized, path-dependent patterns of social action (see [Reuter, 1994](#); [Biesecker and Kesting, 2003, 115ff., 184ff.](#)). Here the field of economics dons the garb of cultural studies. The institutionalism's conception of humans as agents that shape institutions (which opens up a perspective on preference formation) and are shaped by them rejects any and every kind of dualism, declaring dualisms and dichotomies to be the result of processes of social construction. As [Hoppe \(2002, 119ff.\)](#) shows, this is wholly compatible with the feminist critique of economic theory. As K. William Kapp has shown, the approach permits us to perceive ecological nature as the productive base of human economic activity (see [Kapp, 1963, 1987](#); [Heidenreich, 1998](#)). Here economics takes on the form of an evolutionary science. And starting here, it would be possible to forge on with the work of developing an economic theory that looks back beyond the construction of dualisms and would be capable of overcoming them – that would no longer be in need of the structure of cleavage between productivity and “reproductivity.”

We also find this new quality of economic thought in Kenneth E. Boulding, in particular in his metaphor of the “spaceship earth” ([Boulding, 1993](#)). Here Boulding – distancing himself from earlier notions of an “open,” seemingly boundless earth – outlines the contours of a future “closed,” bounded, earth, where “man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy” ([Boulding, 1993, 303](#)). He sees economics as “a subset of the ‘world set’” ([Boulding, 1993, 299](#)), as the aggregate capital stock given at any one point of time. What this in turn means, he explains, is “the set of all objects, people, organizations, and so on, which are interesting from the point of view of the system of exchange” ([Boulding, 1993, 299](#)). The task of a future “spaceship” economy would thus be conservation of its stocks of capital,

quantitative and qualitative, including e.g. the state of health of the people living in it.

The ecological economics that has emerged since the later 1980s, in particular in connection with the sustainability discourse, has learned a good deal from these approaches (see [Costanza et al., 1998](#)). But it has not succeeded in developing an integrative conception of the economy, one geared to conserving the productive foundations on which economic activities build. And the reason is that the concept of natural capital – harbingers of which can, as just shown, already be observed in Boulding – has been thrust into the center of this theory. Herman E. Daly has contributed in key ways to the development of this theoretical conception, and we will therefore discuss this issue with reference to his theory.

[Daly \(1996\)](#) sees nature as an ecosystem whose extent remains constant. The economy is its open subsystem. The ecosystem serves at once as a source of raw materials (physical resources and energy) that flow through the subsystem, the economy, in the course of the economic process and as a sink for waste materials. For Daly, this nature becomes a barrier to the expanding economy. Put differently, this natural capital becomes a limiting factor. Daly's fundamental rule for sustainable development is therefore, “Conserve natural capital.” Daly outlines historical development as the transition from an “empty world” (“empty of people and their artifacts, but full of natural capital”, [Costanza et al., 1998, 5](#)) to a “full world”, one that is “full” of economy. His concern is to find a “scale” of the economy optimal in terms of scarce natural capital as well as ways to minimize and more efficiently design “throughput quantities” as one element of a comprehensive concept of efficiency.

In the conception of natural capital formulated here, nature is viewed as a stock, not as productivity. Under this category nature, in the sense of a self-conserving and ever-changing, living entity, is reified into a constant. While Daly's notion of a natural capital augmented by investment of “waiting” ([Daly, 1996, 117](#)) does afford us a glimpse of the productivity of nature, sustainability, in this context, is little more than a question of finding the right measure. True, this is an important factor for sustainability. But used as the sole criterion, it falls short of the mark ([Biesecker and Hofmeister, 2001](#)). It overlooks the fact that society and its economy are already physically entwined with nature. Human production and consumption inevitably transform nature. And no limits, be they spatial or temporal, can be set to the natural product engendered by society. This has become an irreversible process. We need think here only of the sheer multiplicity of what has become known as the environmental crisis, and the crisis phenomena – be they e.g. climate change or biodiversity loss – must be seen as the often unintended hybrid “by-products” of an economy in the process of constituting itself as a throughput economy.

This clearly indicates that the time has come to reflect on the quality of the ties we have entered into or may enter into. The central issues would then no longer be concerned with efficiency strategies but focus on the consistency of the products stemming from a cooperative relationship with ecological nature as well as on the organization of these cooperation processes.⁶ The main concern would then be to play an active role in consciously shaping the productivity and reproductivity of nature *within* the context defined by human economic processes. The same would apply as well for women's productivity, an issue complex addressed neither by Daly nor by other theorists of ecological economics.

4. From natural capital to natural productivity

However, Daly's conception of nature as (scarce) natural capital does entail one important innovative aspect for the development of

⁶ For us, “cooperation,” in the sense intended here, i.e. as conscious mediation between human and natural processes, is one of the central principles driving sustainable economic activity (see also [Biesecker et al., 2000](#)).

economic theory: it views natural capital, as a factor of production, as complementary to man-made physical capital. While this represents an important alternative to the substitution rule championed by the concept of “weak sustainability,” with its roots in neoclassical theory, its baggage still contains one crucial flaw of orthodox economic theory that constitutes an obstacle to the integrative theory envisioned here: the cleavage it continues to postulate between man and society on the one side and nature on the other. Natural capital is produced by nature, and physical capital by humans. And this cleavage continues to mask the fact that both are “hybrid” products of natural and human productivity,⁷ the outcome of processes of mediation (that is, mixture or integration)⁸ between man/society and nature (and in this sense hybrid).⁹

We ourselves have proposed the category of (re)productivity with a view to critically scrutinizing the society/nature nexus and opening it up for a theory of strong sustainability (see Biesecker and Hofmeister, 2006). The category designates the “processual unity-in-difference of all productive processes in nature and society” (ibid., 19). The term (re)productivity refers without exception to the complex interplay, and interdependence, of productive processes in social and ecological space, and it is thus a category of mediation, of bridging between the reproductive and productive, between nature and society. One of the key concepts of (re)production theory is natural productivity.

“Natural productivity” contributes more to the theory of strong sustainability than “natural capital,” because the concept serves to describe, in theoretical terms, society/nature relations as relations rooted in mediation. The concept at the same time enables us to integrate the social, lifeworld productivity of women into the process of theory formation. Even more, the concept of natural productivity provides a workable basis for an ecological and social grounding of the theory of strong sustainability. We are building here on feminist economic theory, combining it with some of the important findings of ecological economics. For we are convinced that it is only on the basis of a comprehensive conception of socioeconomic mediation processes that the relations between society and nature will prove able to be shaped in such a way as to conserve and regenerate ecological and social productivities. This, we believe, would lead to a (re)productive economy – an economy able to link production of goods and services for concrete people with the restitution – with conservation and regeneration – of the conditions on which economic activity are based.

We need, in other words, to take a close look at the processes of mediation between society and nature – at mediation processes that we find reflected mainly in the economic practices involved in production and consumption. This calls for a theoretical conceptualization of nature as an actor fully involved in economic processes. That is to say, if we are to arrive at adequate descriptions of and new solutions to existing problems, we need a concept of nature that no

longer describes nature (solely) as an object of human economic activity – as a source of raw materials and a sink for waste materials – but that includes nature, as an economic actor, in the theory of a sustainable economy. This is the perspective we assume in working with the concept of natural productivity.

Building on the model of reproduction developed by Immler and Hofmeister (1998), we have adopted for our category of (re)productivity the latter's conception of natural productivity as a productivity that embraces the processes of anthropogenic production and consumption (Biesecker and Hofmeister, 2006): our approach views mediation with and change to nature (its hybridization into “culture-nature”) as systemic outcomes of economic activity. Every process of production and consumption necessarily engenders natural products – that is to say, “nature” is, necessarily and at the same time, a product socially (co-)engendered – a product (natura naturata) that is at the same time productivity (natura naturans). In this conceptualization the processes in which “nature” is produced and reproduced are physically identical; they constitute a unity.

This is illustrated by the presentation of the four phases of production outlined in Fig. 1. These are the phases involved in the development and disintegration of the animate; in their complex interplay, they pervade the whole of the economic process: in nature productive processes are inseparable from reproductive and regenerative processes. That is, as a production system, “nature,” is at once the starting point (phase 1) and the outcome (phase 4) of the (re)production process.¹⁰ It is in these primarily physical and ecological (re)productive processes that those processes occur that orthodox economic theories regard as the only economic processes: the human production (phase 2) and consumption (phase 3) of goods and services. Looked at under the perspective of the material and ecological processes involved, changes to and regeneration of “nature” – in this sense: evolution – are intrinsic to the overall (re)production process. “(Re)production” thus means not the constant replication of the same but a process in which the animate is regenerated (evolution).

We will now broaden our focus – which has until now been restricted to material and ecological (re)production – to encompass the aspects of the social lifeworld that, while operative in the form of productivity, are nonetheless postulated as “nature” and thus remain invisible for economic theory: the allegedly reproductive activities assigned by society to women. It is here that the (re)production model proves sufficiently robust to serve as the basis for an economic theory of strong sustainability (Biesecker and Hofmeister, 2006).

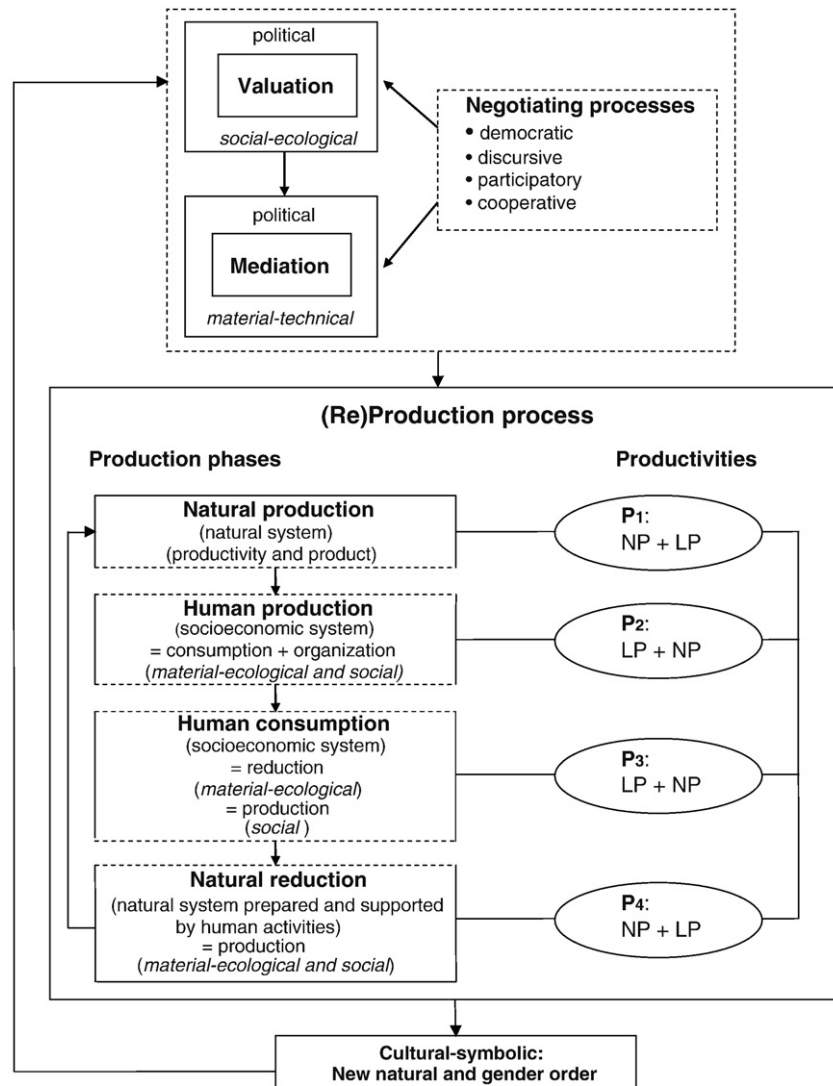
In other words, what we need is an expanded concept of labor productivity, one that has room to integrate the social (re)production of human life through the caring activities assigned to women (see Jochimsen and Knobloch, 1997). It is only a conception of labor broadened to encompass activities neglected until now by economic theory that would open our eyes to the fact that productivity is inseparable from “reproductivity,” even when it comes to people's day-to-day activities. Viewed in terms of labor as a “whole” (Biesecker, 2000), we now see that production is inseparably intertwined with “reproduction”: The processes involved in the regeneration and restoration of human and nonhuman life are intrinsic to each and every process involving the production of goods and services. Only on the basis of a short-sighted economic thinking that reduces productive labor to “gainful,” commodity-producing labor has it been possible to obscure the inseparable ties between the productive and the “reproductive.” As soon as the veil of (false) economic consciousness is lifted, we are able to perceive the (re)productive as the dominant mode of all active life.

⁷ We use the term “hybrid” here in its literal sense: natural and human products and productivities are “amalgamated” in the process involved in the production of goods and services, which contain shares of both. It is above all Latour (1995, 2004) and Haraway (1985) who have formulated this in theoretical terms for the relations between man/society–nature. We are building here on these theoretical considerations; See Section 5.

⁸ For further explanation, see Section 5, below.

⁹ While Daly, asking how investment is made in natural capital, comes up with the category of “cultivated natural capital,” (Daly, 1996, 80), describing it as a category “that overlaps those of natural and man-made capital” (Daly, 1996, 80). He then, though, proceeds to dissect this hybrid form into its human and natural components, going on to speak just about exclusively of a “strong complementary relation” (Daly, 1996, 81). Some recent contributions on the theory of “strong sustainability” adopt the term “cultivated natural capital” (e.g. Ott and Döring, 2004, 143). As we have pointed out elsewhere, though (Biesecker and Hofmeister, 2009), this approach does not lead to a theoretical opening of ecological economics for the processes of mediation between society and nature, and thus fails to come up with an analytical conception of the physical and material reversal of the structure of separation between society and nature that can already be observed.

¹⁰ Unlike Immler and Hofmeister (1998), we for this reason speak of “(re)production”: The formulation is meant to indicate that there is, in the physical-material dimension, no basis for the cleavage between production and “reproduction” – here both are achieved in unity. Assuming a critical view, we have shown (Biesecker and Hofmeister, 2006) that this cleavage exists only in the economic dimension.



Mode of (re)production in a sustainable society (Taken over in modified form from Biesecker/ Hofmeister 2006, 134, 166)

Fig. 1. P_i = productivity set in the different phases of production; NP = natural productivity; LP = labor productivity. The principles of mediation and valuation are found through processes of democratic negotiation in all four phases. The praxis of the (re)production process changes the cultural-symbolic order, which influences the processes of mediation and valuation. This is indicated by the feedback arrow. For further explanation, see Section 5, below.

That the veil could be lifted is due to feminist economic debates on labor and productivity and a narrow economic definition of them that marginalizes the socially necessary work performed by women. Based on the Marxian (value) theory, these issue fields marked the beginning of the (new) women's movements and women's and gender studies in the 1970s and 1980s. The central economic concern here was the above-mentioned (Section 2) "housework debate" in economic theory, which started out by addressing, from a value-theory perspective, the integration of "housework" into economic theory and was later combined with and integrated into the general methodological critique of the dualistic approach adopted by orthodox economic theory in its construction of the economy.¹¹ At

first implicitly, later openly, the discussion centered on the distinction between production and reproduction. In analyzing the cleavage between production and reproduction – and the divide between public and private implied by it – women's and gender studies criticized, at an early point of time, the removal, in economic theory, of commodity-producing labor (allegedly the only form of productive labor) from the context of (re)production.

This discourse, broadened to include the socioecological, clearly shows that the "blind spots" of industrial-capitalist market economy must be sought in two different places: Much like the ecological productivity of living nature, women's activities are excluded from the economic and held in obscurity. Capitalist production for the market necessarily presupposes the "reproductive" activities or inputs provided by women no less than by ecological nature. The concept of natural productivity for this reason opens our eyes both to the role played by ecological processes in the economy and to the social lifeworld processes involved in the whole of human activity. The significance of this concept must therefore be seen in the fact that it supplies the key needed to bring together labor productivity and natural productivity in the concept of (re)productivity.

¹¹ For the German-language debate, see Bock and Duden (1977), Werlshof (1978), Kontos and Walser (1979), Beer (1990). For an earlier overview of the English-language discussion, see Himmelweit and Mohun, 1977. See Ferber/Nelson (1993) as well as Kuiper and Sap, 1995 on efforts to broaden these discussions, down to and including approaches geared to an autonomous feminist economic theory. Hoppe (2002), 152ff., presents a thorough assessment of both the English- and the German-language debate.

5. The category of (re)productivity and what it implies for the discussion on a sustainable economy

In formulating this new concept, we (Biesecker and Hofmeister, 2006) develop the category of (re)productivity in a twofold sense: as a critical-analytical category useful in gaining an understanding of the present socioecological crisis¹² and as a constructive category for a theory of the sustainable economy.

Cleavages as dichotomizations – which necessarily imply hierarchization – both vis-à-vis and in two spheres, the social and the lifeworld, must be seen as the root cause of unsustainable modes of life and economic activity. These have led us systemically into a crisis that is perceived on the one hand as an “ecological” crisis and on the other as a social crisis, although they have until now rarely been perceived in their interconnectedness. There is, in fact, only one crisis – the crisis of the “reproductive.” We can illustrate this using the category of (re)productivity: the phenomena associated with the “ecological” crisis (loss of natural productivity) and the social, lifeworld-related crisis phenomena that are perhaps best summed up as a “crisis of reproduction work” (Rodenstein et al., 1996) (e.g. child poverty, juvenile delinquency, “educational crisis”) are found on the side of the “reproductive,” that is, precisely where the economic continues to harbor its “blind spots” – where certain productive activities continue to be disregarded, to remain unutilized. Against this background we speak of the *equiprimordiality* of the two sides of the crisis (Biesecker and Hofmeister, 2006, 17ff.).

The root causes of this socioecological crisis, which is systemically generated and regenerated by the industrial-capitalist market economy, can be analyzed more exactly on the basis of the category of (re)productivity: They must be sought in the paradoxical *modus operandi* of the economy. In the act of valuation, it externalizes what it fully internalizes in the act of valorization, namely the so-called reproductive activities of animate nature and human beings. While the mediation that takes place in processes of economic valorization is physical-material in nature – with the result that every production process generates nature-culture hybrids – it is precisely these mediation processes that are denied in economic valuation¹³: What we find here is cleavage and dissociation. It is only what the economy recognizes and acknowledges as its own productivity (capitalized and commodified labor productivity) that finds inclusion in calculations of value. This mode entails the production of “nature(s)” whose features – purely accidental, if they have any in the first place – qualify them to serve as productive forces and resources for future economic and lifeworld processes. Both consciously produced goods and services and the by-products unconsciously and unintentionally produced along with them, including e.g. flood events, climate change, and chemically polluted organisms – all of which are the natural products inevitably (co-) produced by the economy – are in no way suited to secure the lives and economic activities of future generations. On the contrary, economic production in this mode systematically undercuts the foundations of future life and economic activity.

A sustainable economy will therefore have to turn its attention to the need for mediation of natural products and services with labor productivity and the products of labor. It will have to recognize the need to create a (re)productive “nature” as its most urgent task. The aim of economic thinking and action in a sustainable society will be to ensure the (re)production of all productive processes in nature and society, conceiving them as a unity, without continuing to separate them by assigning different, and negative, values to them.

Above and beyond critical analysis, the category of (re)productivity may play a relevant role in ensuring that the vision of a sustainable mode of economic activity actually takes on shape, with what was marginalized in the capitalist economy as the “reproductive” coming to be recognized as the central productivity of sustainable societies – the productivity of nature and man, men and women alike. What is needed to provide a concrete idea of how economic activity will be organized and function in a sustainable society is a “reinvention” of the economy (Biesecker and Hofmeister, 2006) based on the category of (re)productivity. That is to say, a sustainable mode of economic activity would be a multiplicity of balanced and coordinated productive processes whose qualitative-material and value dimensions are determined on the basis of negotiating processes at all levels of social (re)production. In Fig. 1 this social framing of the actual (re) production process is characterized by the processes involved in valuation as well as in mediation (namely the mediation of the required natural materials and energies with human activities). The processes of valuation and mediation, pervasive throughout the various phases of the (re)production process, impact on existing nature-society and gender relations. Their changed state, in turn, impacts on the resulting new negotiating processes; in Fig. 1 this is indicated by the feedback arrow pointing from existing nature-society and gender structures to valuation and mediation processes. The latter – and this is not adequately reflected in Fig. 1 – takes place at many different levels – at the microlevel of the household or firm, at the regional level, at the macroeconomic level, at the global level. A sustainable, i.e. (re)productive, economy would be a multi-level economy – and in this sense resemble the political sphere.

The actual (re)production process breaks down into the four phases described above. If we take this question up here again, it is to ask more exactly how the processes of mediation between nature and society would be reflected in a broadened concept of labor and labor productivity. Productivities (P1–P4), operative in each phase of the (re)production model, can now be conceptualized as specific mediation processes between natural and labor productivity – as productivity sets.

In *phase 1* (natural production system, with productivity set P1) the productivity of ecological nature accounts for the dominant share of productivity ($NP + LP$): It is here that those natural inputs are operative that are used to make the products consumed in phase 2, the anthropogenic production system (materials and energy). However, here natural productivity is supported and flanked by caring activities and prudent measures adopted by economically active persons – the active intent of labor productivity is to conserve and improve natural processes (this would include e.g. rural conservation activities). Looked in terms of mediation theory, these services and products also embody the results of previous (re) production processes: In other words, what we have here is, at the same time, “materialized” labor productivity (LP) – with the social (by-)products embodied in natural beings, spaces, and times. To cite an example, the wind that provides us with electrical power may at first glance appear to be “pure” natural productivity. But as soon as the wind turns into a hurricane, we become aware that climate change, a “by-product” of industrial-economic processes, is indirectly involved in these natural inputs. Or let us take the bark beetle. In late-modern “wilderness areas” it may seem to be a natural creature, although it takes on the garb of a nature-culture hybrid as soon as protracted drought periods due to anthropogenic climate change allow it to proliferate and annihilate the timber crops of generations. Natural productivity is thus invariably pervaded by “natural products” that are actually at the same time by-products of social activities. Product and productivity are identical, and both are generated by the physical-material mediation processes that take place between man/society and nature. In the future the quality of the natural productivity operative in phase 1 will need to be preserved and shaped throughout the whole of the (re)production process.

¹² This formulation is in keeping with the Social Ecology research program (Becker and Jahn, 2006); the category of (re)productivity is our contribution to the further development of the program.

¹³ Here we take up the basic pattern developed in Latour's “symmetric anthropology” (1995), applying it, with a critical thrust, to the analysis of the role played by the economic in the production of the relations between society and nature.

In *phase 2* (anthropogenic production, with productivity set P2) a first glance would seem to indicate that labor productivity (*LP*) – here restricted to commodity-producing labor – is by far the dominant factor ($LP + NP$). However, the parochial view proves to be deceptive in two senses: If we use the term productivity as a process category, we see that each and every particle of commodity-producing labor invariably embodies both the inputs of animate nature – part of which we, as working persons, necessarily are – and the productive caring activities traditionally assigned to women. In other words, commodity-producing labor has a twofold aspect – it is at once the product and productivity of the activity of living beings. Indeed, the techniques used to produce goods are themselves the products of processes of mediation between society and nature; they are used to transform the inputs provided by nature, in order then to fulfill their specific functions in the anthropogenic system of production. And finally, even the materials and energy (“resources”) transformed here are nothing other than natural products – products of previous production phases that are here *consumed* in productive ways. Viewed in terms of (re)production theory, anthropogenic production – which the dominant economic theory has until now regarded, mistakenly, as the only productive form of production – proves to be an (often wasteful) mode of consumption of vital productivity.

Phase 3 (anthropogenic consumption, with productivity set P3) may seem at first to be concerned only with “reproductivity” (and not with productivity). However, viewed in terms of a concept of labor broadened to include (re)production, this interpretation proves to be incorrect: a perspective that views household practices as consumption systematically disregards all female activities, that is to say, the by far larger part of all human labor productivity. The concern here is the further productive processing and/or direct use of the products and services resulting from phase 2 for human life processes, including the restoration of labor itself. What is operative here is labor productivity ($LP + NP$) – though (still) in the shadow of the economic in that this labor is neither market-coordinated nor remunerated. And as far as the productivity of ecological nature is concerned, we see that what is operative here is not merely the vital natural forces of human beings but nonhuman natural productivity as well. It is impossible to conceive of any process involving the use and consumption of products that is not at the same time bound up with energy conversion and transformation. These processes need to be comprehended as part of the overall natural (re)production process and consciously structured with a view to the natural products that result from them. This is the reason why we must conclude for phase 3 that human consumption also consists of processes of mediation between man/society and nature.

Phase 4 (natural reduction, with productivity set P4), in turn, appears to be shaped mainly by natural productivity, while labor productivity plays a comparatively minor role in it ($NP + LP$). In material and ecological terms, this is a hugely productive phase, one involving processes of natural synthesis and decomposition the results of which, in turn, flow into the (re)production processes in the form of productivity. Yet there is no mistaking the involvement of human productivity (*LP*) here. On the one hand, labor productivity is spent for supportive ends, with material reduction processes being supported and shaped by technologies (from composting to waste incineration plants); on the other, labor productivity impacts, in unintentional though obstructive, disruptive and destructive ways, on natural reduction processes. To cite an example, the anthropogenic materials contained in “waste products” counteract reduction as a natural-productive process – and what results is not the desired natural productivity but “toxic substances.” And there is very little doubt that natural products give rise to various productivities whose characteristics are no longer compatible with natural (re)production processes. For example: substances that damage the generative reproduction systems of humans and animals, including endocrine substances (Colburn et al., 1996) or hormones in drinking water

(Kümmerer and Hofmeister, 2008) – or indeed radioactive substances, which retain their destructive potential for hundreds of thousands of years. In view of such – potential or actual – disasters, we speak of “ecological” crisis phenomena, although looked at from the perspective of (re)production theory, these phenomena prove to be incorrectly generated natural products – counterproducts of anthropogenic production and consumption. A sustainable economy organized across all four phases with a view to (re)productivity would be capable of avoiding, from the very start, the generation of any such natural products.

6. Conclusions

A view based on the category of (re)productivity clearly shows that socioecological mediation processes are involved in the whole of the economic process. This makes it possible to grasp economic activity as an act of comprehensive socioecological transformation, one that now needs to be consciously shaped with a view to creating a sustainable economy. Here both natural and labor productivity prove, in their processual intertwinement, to be self-conserving and self-regenerating. The concept of natural productivity shifts into the center of analysis what an ecological economics rooted in capital theory necessarily lacks – a conception of the processual dimension of socioeconomic mediation. An economic theory of sustainability determined to get beyond admonitory calls for an efficient and (self-)sufficient mode of economic activity and to understand, and shape, the economy as a consistent process of mediation between society and nature has no choice but to position itself beyond the perceived cleavage between society and nature (without losing sight of the need to distinguish between them). The concept of natural productivity can serve as a basis for achieving this end.

We have shown that a thinking that chooses the concept of natural productivity as its point of departure leads to an expanded concept of labor productivity and is capable of interlinking the two concepts. Only on this basis is it possible to conceive of economic activity as a process of socioeconomic mediation. A conception of this kind then leads to the concept of (re)productivity. The form that sustainable economic praxis will take on is that of a (re)productive economy. The main consequence for the economic praxis of a sustainable economy is the task of shaping the productivity sets in all four phases in such a way that the productivities of nature and of labor are “conserved”. That entails, as illustrated above, a multiplicity of new policy-related tasks – e.g. the tasks involved in designing products and processes, in both qualitative and quantitative terms, without losing sight of the socioecological implications they have for efforts to renew and regenerate ecological and human productivity. In a (re)productive economy, product development thus also invariably implies “reduct development” – the socioecological qualities of the natural product inevitably produced in and through the social production process are the object of social decision-making processes and the priority task of economic-technical practices (see Hofmeister, 1998). One pivotal factor here is to ensure that the spatio-temporal scales and patterns inherent to social and ecological processes are duly coordinated (see Held et al., 2000).

The imperatives of equity inherent to the model of sustainable development – both generational and intergenerational – shape the praxis of sustainable production throughout all four phases. Indeed, we may even go so far as to say that equity is the base resource of a (re)productive economy, and at the same time its outcome. In orienting the mediation processes between human and natural productivity to future products that assume a socioeconomically productive character, a sustainable society will make the ethical a key element of its thinking and action. A (re)productive economy will reach its “high-reliability” (Nelson, 2008) by conceiving of the social and natural not merely as its foundation but by embracing the task of ensuring that this is and remains the base of all future economic

activity – both in and through each and every production process – and by setting itself the goal of conserving and renewing this base. “The real question we need to address is... How do we want to live, in light of the effects of our life choices on other people and living beings, now and in the future?” (Nelson, 2008, 446). Indeed, we could not agree more. And we hope that in presenting our contribution we have not only posed this question but, based on the category of (re) productivity, have at the same time found a possible answer to it as well.

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