ETHICS, POLITICS, AND NONSATIATION IN CONSUMPTION: A SYNTHESIS

João Rogério Sanson*

Introduction

Consumption is something implicitly desirable both in neoclassical theory, with the models of utility maximization, and in Marxian theory, in which important part of the consumption potential of the worker is appropriated by the capitalist. In the circular flow, consumers sell goods and services, basically labor services in more advanced economies, so as to buy consumption goods. Market work is one of their outputs, and the goods consumed may be interpreted as inputs. In contrast with the production of goods and services by individuals operating through firms, where the costs of production of goods are minimized under appropriate behavioral assumptions, consumer-workers have as objective the maximization of consumption expenditure, i.e., costs of production of their outputs, once they choose time for market work. Social welfare evaluations are made under such assumption, as in cost-benefit analysis. In a well-known paper,[1] Kenneth Boulding raised a criticism against this assumption. Were the impact upon the limited resources available in the spaceship Earth taken into account, consumption expenditure should be something to be minimized.

The main implication for the ecological debate is that societies that maximize consumption may, in the long run, get in trouble if the natural resource limitations are not

* Professor of the Department of Economics, Federal University of Santa Catarina (UFSC), Florianópolis, 88049-970, Brazil. E-mail: jrsanson@mbox1.ufsc.br. For previous suggestions and informal discussion, the author thanks Kathleen Fernandez, Eugenio Cánepa, Duílio Bêrni, Rubens Garlipp, Leonardo Monastério, Cláudio Burian, Armando Lisbôa, Jean-Luc Rosinger, Vicente B. Sartor, Jofre Wendhausen, and Gilberto Montibeller Jr. Comments received during seminars at UFSC, UFPR, and Unicamp are also acknowledged. Prof. Nicholas Georgescu-Roegen influenced the author on the subject of the paper since the early 1970s at Vanderbilt University. As usual, mistakes and misinterpretations should be blamed upon the author. He also thanks the National Council for Scientific and Technological Development (CNPq), from Brazil, for a grant that included research assistance from Marcelo A.Fontoura, and Luiz O.M.Oliveira.

considered. Based on this criticism, we may reject the whole neoclassical theory or argue that preferences should be changed. The microeconomics of consumption allows for global satiety over the preference relation, although the theory of demand is generally developed for the nonsatiety case. Therefore, the question remains whether such a postulate is a mere description of the average pattern of consumption in the world today or whether such preference could be different, even if economists are not forewarning societies about its dangers. Either we abandon the economic theory of consumer as we know it or we keep it as a reasonable description of reality and evaluate the long run consequences of such behavior in a larger context. After all, even if consumer preferences were to be abandoned in this kind of analysis, someone's preference would still have to be considered, as Krautkraemer (1998, p.2099) reminds us, sometimes in the form of moral imperatives.

We initially look at how standard consumer theory considers inputs and outputs, and then discuss, in the light of ecological questioning, the proposal for consumption as costs that should be minimized. Thus, in the next section, we consider how inputs and outputs are defined in the context of household production theory. Then, in the following sections, we review and evaluate the criticisms made by the ecological literature, placing the question of nonsatiety in consumption in a larger institutional context that includes ethics.

Inputs and consumption

We will first review how consumption is treated in both consumer and household production theory. We also discuss the related practice, in general equilibrium models, of using negative variables to distinguish inputs from outputs. This is related to how consumption is viewed in consumer theory.

Consumer theory is usually presented as an ordering of commodities[2] that are consumed. To take care of labor supply, leisure time is also included in the ordering relation. In fact,

---

[1] See Boulding (1966), who thinks in terms of throughput, a concept that also comprises the net addition to the capital stock. Daly (1985, p.289) shows that Boulding argued along these lines since 1949.

[2] The preference relation is the way consumers order commodity bundles. Despite the fact that this ordering does not require the concept of utility, it is usual to speak of goods as generating satisfaction or pleasure to consumers. In fact, the concept of welfare of a consumer is metaphysical in the sense that it appears through its consequences, being nonmeasurable. In spite of being known for attempts at measuring utility, Fisher (1930,

the supply of work, an output from such a consumer, is defined as a residual from the endowment of work time in the period of analysis, after leisure time is chosen. A more general approach is to start with endowments of each good and work time and define excess demand functions for each of them. Whether a commodity is input or output from the viewpoint of the household, we know it by the sign of the excess demand variable. The point of zero excess demand depends on the preferences of the agent, with the respective marginal rate of substitution defining the reservation price. The only exception to this is the excess demand for work. The endowment is given by nature and the agent may only act as a supplier of his own work, i.e., work time can only be an output. With reselling being a possibility, the demand for someone else's work is just the demand for a service like any other. In this case, whether the individual will seek to work or not depends upon the reservation price.

In the context of household production, the economic agent buys commodities to produce consumption goods and market commodities. In the simplest situation, the worker buys commodities for direct consumption and at the same time sells work as a commodity. We can thus see work as a produced commodity. In this productive process, goods consumed represent inputs. This is the approach used by the classical and a few modern economists like John von Neumann.[3] For a given agent, the definition of a commodity as input or output now depends on market prices. In agricultural production, this is easier to see. For example, the farmer may be a net buyer or a net seller of corn; it depends, among other things, on comparative advantages associated to the productive process. Thus the definition of the list of inputs and outputs is an empirical question.

In a simple household production model, the consumer buys goods as inputs for domestic production. Work still is the output. The domestic production process generates outputs that are used as inputs in the consumption process. But from the viewpoint of our analysis what counts is the production frontier of the household. Thus the domestic

---

ch.1), based on Vilfredo Pareto, postulates that utility can not be measurable. Postulating an arbitrary function and estimating it so that it fits a preference relation, which is the approach started by Fisher in his attempts at measuring utility, is not the same thing as measuring the psychological concept of utility. It is only a description of the preference relation.

[3] See von Neumann (1938). For a reference about the position of the classical economists, see Samuelson (1985).

production process is ignored. A generalization follows when we consider the possibility of some other outputs of domestic production besides work being sold in the market. Firms can then be seen as an extension of the power of production of households through the social division of work. Therefore, the concept of input and output, or more generally, netput, is the same as in domestic production.

A related question is the direction of preference for inputs and outputs. In the model where the only produced domestic commodity is work for the market, the rule of more preferred to less - monotonicity or at least local nonsatiety - applies to every commodity in the preference field. Work, being a residual, is not listed in the preference field. This direction of preference implies that a commodity is a good from the viewpoint of the consumer. It is something the consumer is willing to trade some other thing for it.

However, there is a set of commodities whose preference direction would be reversed, that is, less of each would be preferred to more. They are known as bads. This is the case, for example, of domestic garbage. Instead of having to worry about the direction of preference for each type of good, the theoretician simply redefines the consumption activity involved. In the example, domestic garbage is treated as getting rid of it. Instead of an output it would be considered input. This idea is then extended to treat negative externalities, like pollution. A related concept is the noxious commodity (Debreu, 1959, p.33) which involves a negative price. The economic agent would pay for an output. It would be an alternative theoretical treatment of a bad. But then the price vector would have to allow for negative variables. A quick look at popular textbooks in economics shows that the procedure of redefining bads as goods has won the preference of the profession.

A further related question about inputs and outputs of a household is their representation through variables with sign restrictions. In some theoretical quarters, especially in general equilibrium models, there is a lack of symmetry in the treatment of the firm and the consumer. Inputs are represented by nonpositive, and outputs by nonnegative variables in the description of the firm. This makes it easier to generalize theorems on comparative statics from profit maximization. Several results follow by simply making explicit the sign of the netput. But when it comes to the consumer, the practice is to reverse the signs of

inputs and outputs (Debreu, 1959, p.30 and 51).[4] It appears that this lack of symmetry has to do with equating supply and demand. Outputs from firms are nonnegative variables. So, demand by consumers should also be nonnegative variables, despite being input to consumers. As a consequence, the fact that goods consumed are inputs to economic agents tends to be underplayed. It is such a point that Boulding's proposal for minimizing consumption puts in evidence. His ideas gained evidence with the wave of concern with running out of basic natural resources in the 1970s. Soon a renewed concern with excess population in the world came along.

Evolution and consumption economics

The postulate of preference for higher consumption has been used as a good representation of reality. So, we keep it as a basis for our analysis. We may then look for the implications of this behavior, and ask whether, from a longer run viewpoint, preferences might encompass a concern with the environment. In order to look for these consequences, without much hope for finding them, we will discuss consumption in an evolutionary context.

The more the better is the motto of the representative consumer. The exceptions are few, like the hippies of the 1970s, with a few of them still going around, and some religious groups. In the wake of the recent antiglobalization movement, “buy-nothing-days” have been called for. In some of these cases, though, other people must in general provide for sustenance, despite frugality in consumption.

Of all that is produced in each period, the main limitation to consumption in that period is what is put aside as savings. The interaction between savings and consumption is what defines the trajectory of capital and, consequently, the trajectory of consumption itself for a given economy, which can be the world. The intertemporal preference of such a society defines how much is saved in each period, thus conditioning the trajectories of the whole

[4] It seems that this convention originates from suggestions made by Samuelson (1947, p.215 and 237). He mentions Barone (1908) as his source, but in fact we could not find such a convention in that paper. Enrico Barone simply subtracts input costs, inspired in accounting practices, as does Fisher (1930). Subtracting a positive variable from another is slightly different from working with negative variables. The generalization that is straightforward with the latter is less elegant with the former.

system.[5] So, at this point of the analysis everything is tied to preferences of consumers. Nonsatiety is now interpreted intertemporally, but subject to the wealth available at the moment of the decision. Intertemporal preferences define how this wealth is managed from there on. Most of modern theory of growth is a variant of this basic idea, including technological progress, government, and endogenous population growth. In the ecological context, this kind of theory has been associated with the names of Robert Solow and Joseph Stiglitz. The models involve a time horizon between half and one century, as suggested by Stiglitz.[6] A positive rate of discount in intertemporal preference of economic agents, which is consistent with reality, is one of the basic forces that shorten the time horizon of these models.[7]

We thus return to consumer preferences as a basic determinant of the evolution of an economy. A basic question then is whether preferences evolve in the long run. In the time horizon of growth models, they do not. It also seems consistent with reality. As the household production literature usually supposes, what changes most frequently is the technology of production of commodities. The nature of commodities, or of services demanded, changes little. Take entertainment services as example. In the last decades, there have been great changes in the way these services are provided. More specifically, middle-aged persons saw films only at movie theaters in the fifties, then started seeing films on TV, but with fewer options. Later on, they could see films of their choice at home, first with tapes and now with compact disks. Despite all these technological changes, the service has been entertainment provided by a movie. In reality, fiction performed by a group of actors is as old at least as the Greek tragedies of over a couple of millennia ago.

---

[5] See Samuelson (1985). Of course, this is the staple of growth theory, but Paul Samuelson embeds the discussion in the evolutionary context.

[6] See Daly (1997), where Robert Solow and Joseph Stiglitz reply to a paper by Herman Daly, who brings back earlier criticisms made by Nicholas Georgescu-Roegen on papers of Solow and Stiglitz from the 1970s. See also Mayumi, Giampetro, and Gowdy (1998).

[7] This long run is short enough to be seen during a lifetime. In fact, the Twentieth Century comprised several examples of economic phenomena that occurred in such a long run, especially the several experiments in promoting economic development for different countries around the world. It is known that John Maynard Keynes said that in the long run we are all dead, in the context of his theory of aggregate employment. He was certainly using a rhetorical image for economists, since he himself saw the realization of some of his pessimistic predictions on the long run of European political relations.

However, in a longer time horizon than the one of growth models, preferences may change. Norton, Costanza, and Bishop (1998) survey the literature on this question and argue that preferences evolve, being formed both genetically and culturally. Bergstrom (1996, p.1906-1910), in the context of the economics of family, also surveys the literature on the evolution of preferences, even presenting some formal models of preference formation towards relatives. Preferences reflect "problem-solving abilities and a complex of general tastes and desires that are correlated with reproductive success in a great variety of situations." Cultural evolution is an adaptation by these general tastes to different environments. Change in preferences due to genetic conditioning is much smaller than due to cultural conditioning.

Lintott (1998) surveys the literature for factors that lead to nonsatiety in consumption, or to excess consumption, as related to "basic material needs." One of these factors is envious consumption, which does not add to aggregate welfare. Other factors are traps such as addictive consumption and impulsive buying. He also mentions loss of security in modern society as compared to traditional society, the need for stimulus for high-income consumers while low-income consumers need comfort, and consumption as a form of displaying belonging to a group or social *status*. Advertising reinforces most of them.

An increasing world population strengthens the effect of high consumption upon natural resources. It seems that population growth has occurred at low rates for most of the millions of years of humankind evolution. At about twenty centuries ago, the world population numbered approximately 300 million people, and attained only 310 millions ten centuries later. Then it increased faster reaching 790 millions in the year 1750, with annual growth rates under 0.5%. Finally, in the next 2.5 centuries, the world population grew to 6 billion people, with growth rates as high as 2% in the 1960s, although with a tendency to lowering in recent decades. A graph of this time series would show that we are in the upper steeper part of a logistic curve. The basic questions are how long we still have to travel along this curve before its upper flatter region is reached and how high this region stands. Under this hypothesis, the present high population growth is temporary. But, starting about the time of the Industrial Revolution, it has been coupled with increasing average per capita consumption. Also, this access to higher consumption and its stabilizing effects on population growth have not yet reached the whole world. The 1998 United Nations estimate

for the year 2050 a world population of 8.91 billion people.[8] However, Foley (2000) estimates a stable world population between 7 and 8.5 billion people, based on a model that takes account of endogenous population growth and technological progress. If we look at a logistic curve based on the mentioned population data, Foley's result means that the world population growth will be drastically lowered so as to nearly stabilize total population in one or two centuries from now.

It is unnecessary here to review the consequences of such a population size for the evolution of other species that co-evolve with humans and for the effects upon natural resources, especially the nonrenewable ones. Earth's capacity to sustain a large human population during a short period is very different from carrying such a population for an indefinite period.[9] The voluminous literature on these consequences is sometimes referred to as neo-Malthusian, because of its concern with the impacts of population growth upon limited natural resources, not necessarily in a pessimistic vein. The present paper, of course, may be considered as part of it.

From the evolutionary point of view, the consequences of excess use of natural resources may be seen in different time horizons. A very long run is one in which genetic change in humans occurs. Results from genetic evolution are basically unpredictable,

---

[8] See Kremer (1993, Table 1), and Robinson and Srinivasan (1997). Present numbers differ somewhat from Kremer's. I preferred the United Nations data (www.popin.org), which give much higher numbers for the first ten centuries. Even with Kremer's numbers, which start at 170 millions, at AD, and reach 265 millions, at the year 1000, the growth rates are very low, so the argument above is not affected. A related hypothesis is that the early long period of low population growth is the upper flatter part of a previous logistic curve whose steep part coincides with a population spurt at around 13.000 years ago. On this earlier period, see Smith (1992) and Diamond (1997).

[9] Examples from this literature are Daly (1997), Robinson and Srinivasan (1997), Krautkraemer (1998), and Portney (2000). In a shorter time horizon, some non-renewable natural resources are not being exhausted as predicted in the 1970s. Investments in prospection and continuous technological progress, mostly induced by market institutions, have postponed this exhaustion. Relative prices and technological progress may also give economic value to as yet untapped natural resources, further retarding global exhaustion. As for renewable resources, there is the sink problem, specially caused by pollution. However, assignment of property rights and other properly designed incentive schemes might lead a environmental Kuznets curve, whereby economic development initially worsens the environment, but as countries get richer they can start paying for a better environment. But in a longer time horizon, at least in terms of centuries, the impact of humankind growth upon natural resources is not an idle question.

except for some tendencies.[10] A long run could be the one in which cultural evolution occurs. As we will see below, even this time horizon can be decomposed for different aspects of cultural evolution.

Within the time horizon of cultural evolution, the predator-prey model might be applicable. This model envolves a process that repeats itself and allows for prediction. Methodologically, this predictability means that equilibrium models, inspired in classical mechanics, can approximate some types of interaction among different species, considering the genes of such species as given. Although nonpurposeful, genetic selection optimizes in a statistical sense by its pruning of gene variations that are less adapted to a given environment. Besides, it involves a qualitative transformation in the changed species as compared to its previous form. Thus, calculus models would be inappropriate since they are of the arithmomorphic kind, not allowing for qualitative transformation in the variables whose change rates in quantities are being described. Nevertheless, in the last few decades, biologists have been using the theory of games, which can be seen as a type of mathematical optimization, to describe evolutionary processes in nonmechanical fashion. Qualitative changes still imply new payoff matrices in the corresponding games.[11]

Brander and Taylor (1998) develop a predator-prey model to explain the predatory action of a population group upon renewable resources, the prey. Their main application is to the case of Easter Island, but several Mesopotomian civilizations plus the Chaco Anasazi and the Maya civilizations are mentioned. They are examples of excessive predation. This predator-prey model need not result solely in extinction, as for the civilization of Easter Island. Different values for the parameters of the differential equations, reflecting various realities, may generate more optimistic results. Some of the parameters reflect the preferences of a society in relation to consumption versus maintenance of its resources.

---

[10] Evolution may be seen in a narrow and a broad sense, according to Faber, Manst e Proops (1998, p.40). In the narrow sense, it may repeat itself, so that the history of a process might be used to understand another that repeats itself. Examples are the evolution of a seed into a plant or of a young organism into an adult. This allows for prediction. In a broad sense, evolution is a n open process, with a high degree of unpredictability as to the details of the process, its changes and duration.

[11] See Georgescu-Roegen (1988), Cronin (1991), Hodgson (1993, ch.13), Faber, Manstetten, and Proops (1998, ch.8), and Khalil (1998).

We can now return to our discussion of cultural evolution from a different angle. Cultural evolution is related to the evolution of information. Even biological evolution itself can be interpreted as such. We may see the survival of the fit as the survival of the genetic code. Reproduction means transmitting to the next generation a set of bits of information on the characteristics and on the rules for the formation, growth, and aging of an organism. It is such information that survives as the environment conditions the individuals and species that will succeed.[12]

We may see cultural evolution as the evolution of information on the exosomatic arms of humankind. The image of an arms race, or the evolution of the artificial extension of human organs through human made instruments, appears in distinguishing endosomatic from exosomatic evolution.[13] The former is conditioned by information transmitted genetically. The latter is transmission through various means of communication and storage: imitation, conversation, writing, law, custom, and religion. The know-how for making and keeping the material base of humankind is embedded in these means of storage, and materializes in its objects and services.

---

[12] Dawkins (1976) further develops the genetic selection theory, which takes as the unit of analysis the gene itself instead of the organism as in classic Darwinism. On the history and impact of this approach on biology, see Cronin (1991). Monod (1970, ch.1), Georgescu-Roegen (1971, app.B), Boulding (1978, pp.32-33), and Passet (1979, ch.2 of part 2) emphasize that the gene is information. As such, it is capable of reducing entropy in the system associated to an organism. They thus show that a related instrument of analysis is the theory of information, although differentiating between structure-information, the genetic type, and message-information.

[13] On genetic conditioning of culture, see Wilson (1978). The evolution of exosomatic organs is a concept associated, in economics, to Georgescu-Roegen (1971), who of course refers to Alfred J.Lotka (see Mayumi, Giampetro, and Gowdy, 1998). Dawkins (1982) chose to interpret exosomatic organs as extended phenotypes in order to fit them in the genetic selection theory. Thus, a machine would evolve according to the benefits to humans that it gave. The arms race image is found in Dawkins (1988). A different approach is to consider these organs as independent species that symbiotically coevolve with the human species (Dawkins, 1976, ch.11), although with a much higher speed of adaptation. In the example of the machine, its blueprint would evolve governed mostly by an exchange of services with the human species, in the same way that domestic animals do. The latter approach seems to have lost preeminence in the biological literature. However, when we consider the time horizons involved in genetic change versus cultural change, the model of coevolving species seems to fit better the facts. The difficulties in using the biological metaphor for cultural analysis are stressed by Hodgson (1993) and Khalil (1998).

Objects and services evolve themselves. For example, the different means of transportation still fill the same need for humankind, but they have evolved significantly. To begin with, there is a biological part in the evolution of transportation means, given that humans are able to move themselves, while plants can not do, despite also being organisms. But we want to emphasize the exosomatic evolution of the extended legs of humans. Early in history, humans learned how to domesticate other species and to use them for transportation.[14] That technology still evolves today, in sophisticated sports. However, millions of people in the poorer parts of the world use ancient technologies in transportation with animals. Other instruments of transportation started as complements with animals. Today the basic means of transportation such as cars, ships, and planes seem to have a life of their own. Some species get better adapted to their environment and new species still appear.

What evolves, in fact, are the blueprints for making the extended organs. As long as the means for transmitting the blueprints keep existing, these blueprints will change their form, and new species will appear, in some cases with the disappearance of old ones. For societies in which the cultural structure suffers a complete breakdown, like the Chaco Anasazi and the Mayas, and, for that matter, even Ancient Egypt, some of the blueprints become either lost or unintelligible. The corresponding exosomatic arms become extinct. We have only their fossils. In many cases, the blueprints may be rediscovered by the practice of reverse engineering.[15]

The means for transmitting and processing information evolve themselves. Langton (1989) presents a curious debate from the area of artificial intelligence in computers. Some of the participants argued that computers are intelligent and a species that will eventually dominate Earth. In fact, this position was widespread in science fiction literature and the movies during the 1970s, when the mainframe computers dominated the market. The rise of microcomputers, a new species, and of the decentralized communication among them weakened the power of prediction of those neo-Orwellian fiction writers. In this new technological environment, at least for now, powerful states and large corporations have to

[14] Diamond (1997, ch.9) discusses the availability of domesticable animals in different parts of the world for transportation purposes.
[15] See Dawkins (1988, p.174) for a discussion of fossil genes, within a living organism, that might again become functional.

be careful not to be laughed at by teenagers. Even then, debates such as this are part of the needed analysis of the evolution of the exosomatic brain of humankind.

Culture can thus be seen as a label that describes the stock of information, or of blueprints, on exosomatic organs of a human group.[16] These organs include institutions, besides tools, machines, and procedures. For example, bureaucracy, sometimes execrated, is seen at Weberian quarters as one of the fundamental inventions that allowed for civilization. We may see it as procedures for coordinating actions of a human group, by defining functions that are not dependent on specific persons. They are simply replaceable. Replacements may be trained with procedures of a production line, something that the early civilizations put to service for military purposes. Without the different species of bureaucracy, modern states and enterprises would not exist.[17] As another example, the institution of democracy is a species of the various procedures for social decisions, also with a long evolution.

Consumption preferences are part of culture and evolve with it. From the viewpoint of biology, the human being is a converter of mass into energy. The energy produced is used to get more mass, so the life process of a given individual may go on, including reproduction. Getting this energy and guaranteeing reproduction involves recipes of inputs that vary according with the environment in which humans live. The preference relation is equivalent to a production function, as far as the requirements of inputs are concerned.

Economists used to think that the inputs were converted into utility or into some different, and more complex, concept of satisfaction. During the first half of the Twentieth Century, they gradually abandoned this approach, and currently they say that the consumer simply ranks combinations of commodities, without specifying what is the output of consumption. In relation to the economic theory of the consumer, they could say that a metaphysical concept is involved in place of utility. It might be satisfaction or any motivation like impulsive consumption due to advertising, imitation or a sense of belonging

[16] We, of course, are just choosing a convenient definition of culture for the present paper. See Ruttan (1988) for a discussion of culture from the viewpoint of an economist. He needed a two-page appendix for a listing of definitions of culture in anthropology. Our definition mostly adapts the first two in that appendix.

[17] The role of institutions in the rise of capitalism is at the center of the studies of Douglass North, of which, for brevity, we only list North (1981). On institutionalism in general, including its relationship to evolutionary economics, see Hodgson (1998).

to a group. Not drinking wine, due to a religious imposition, even if the person otherwise enjoyed it, could fit in the last type of motivation. The system of incentives in social interaction might also induce consumption. For example, having an expensive car of the year sometimes is a signal from high executives, especially in the financial sector, to tell peers that all is well in financial terms for that person. Sometimes the signal misleads.

In the production of goods and services, the quantity and types of inputs used are mostly chosen so as to minimize costs, if the firms are profit maximizers. In consumption, humans are guided by culture. Currently, culture is such that the tendency to the maximization of aggregate intertemporal consumption, or some of its variants from optimal growth models, is an important objective for all societies, and it is reflected in the way economists describe consumer behavior. From the viewpoint of ecology, this is very discouraging. However, our discussion until now stressed decisions by individual agents, ignoring social decisions. Group decisions form part of the social environment for consumers and, although they are a result of interaction among individuals, they also have a feedback on individual preferences. This is the theme for the next section.

Ethics and Politics

As part of the human evolutionary process, institutions evolve like everything else. They are elements of the set of procedures that societies have to regulate their life. In a given moment, all individuals are subject to a set of these procedures that resulted from a long evolution. Culture conditions preferences, but the interaction of individual preferences may modify culture in the long run in an evolutionary fashion, i.e., not planned as in the case of consumption decisions. In fact, evolution of institutions is related to politics, ideology and ethics. We will present them as phenomena of the same nature, that differ essentially in the time horizon involved. Before that, though, there is a type of institution that has been singled out in recent literature to explain economic development, and which we will relate to our discussion of preference for high consumption. It is property rights.

Property rights as an institution, in the sense that one person recognizes the right of another to withhold an object, seem to have appeared in the range of 40 and 20 thousand years ago. It began with personal utensils and weaponry. It is difficult to know how the results of hunting were allocated, although it is most probable that an equitable distribution

was the rule, with some bias towards the more productive hunters. But the rise in importance of agriculture around 13 thousand years ago, probably as a result of scarcity in animal preys, led to the adoption of property rights on land as a mean to its conservation. We are not considering, as regulated by property rights, the territory that belongs to a community, like territories of tribes in prehistoric societies, something also common for many nonhuman species.[18] Property rights evolved in many forms and today we have several layers of property for capital goods, including property certificates, stocks and mutual funds. All of them are tied to human made goods and natural resources that can be administered this way.

However, there are goods and resources that are difficult or even impossible to be administered through private property. They involve some forms of externality or a public good character. They involve, for example, problems of pollution or of open access, due to high excludability costs. When the number of individuals in a given community is relatively small and the resources may become a property of this community, like a piece of grassland, a river or a lake, then the process of demand revelation is viable for avoiding strategic behavior in the form of free riding. With large numbers of people, a more indirect procedure for resource allocation of those commodities, the political process, becomes cheaper than direct decision.

Our classification leaves out the resources with international open access. The world is not a community in the sense of being able to appropriate such resources. It is more like a group of aborigines that hunt separately and are still setting up basic procedures for administering the common territory. The nations of the world meet frequently to discuss the procedures for managing common resources, but incentives for free riding are strong. Were not for the fact that each nation is a complex of a great number of individuals, the negotiation over common international resources would be relatively cheap to do, and agreement on the best use of communal resources would be easy to get at. It is a well-known result in public good and externality literature that small numbers of agents lower the transaction costs for preference revelation on these matters. Martínez-Alier (1998), in a book on popular ecologism, lists several cases of successful management of communally owned resources in relatively small groups. Sometimes these allocational procedures are

[18] See Smith (1992), Magee (1993), and Diamond (1997).

congealed into age-old customs and even into religious practice. In international terms, some progress has occurred such as the ban on the CFC gas and the limitations on whale hunting. Similar successes can not be listed for equity questions yet, being limited mostly to help during local disasters. The public good character of income concentration, which motivates national redistributive programs in rich countries, does not motivate similar initiatives for international income concentration. Not surprisingly, it is very difficult to motivate rich taxpayers to pay for redistributive programs abroad.

On public goods questions, even at the international level, the political process is then the means for social decisions. Of the several ways to model the political process, we prefer to stress here the one that evolved from the writings of Joseph A. Schumpeter and Anthony Downs. This form of modeling sees the political process with the lenses of neoclassical economics. Politicians sell the service of representing citizens in taking collective decisions. For this they get together in political parties and share costs of production, including advertisement, and even sell the equivalent to brand names, namely ideologies. The political market may be competitive or not, depending on barriers to entry. The pure profit of exercising the political profession depends thus on competition, as in markets for consumption commodities. The members of the electorate choose platforms by voting, but they may allocate, to influence elections and the choice of policies, their own resources in financial form or through their own work time. As in industrial organization theory, the complexification of the state is associated with the result that the representatives take decisions many times in their own interest. In politics, there might also be a bias towards those groups of citizens that directly finance political campaigns. We may also describe power in the political market. Authoritarian governments are essentially a monopoly case. But in the long run, they are also subject to competition, although in the form of conflict, as with price wars in markets for goods under oligopoly. The social consequences are, of course, quite different.[19]

Under a competitive political system, party platforms may receive new issues in a relatively short time horizon. Questioning may start anywhere in society. As an example from local government, a part of a city may become fetid and lose options of leisure due to

[19] See Miller (1997) on what has been the influence of economics upon political science along these lines.

pollution of a river. The mostly affected people may question this, at first privately, and then through the media and politicians, who work complementarily, to start a public voicing of the issue.[20] Sometimes new political parties are formed around a public problem, as in the movement for redistributing income after the Industrial Revolution and, more recently, the ecological movement in Europe. New issues are always raised and, as in markets for goods, political firms try to differentiate their output in order to enter or guarantee a larger slice of their market. Some of the issues are successful in the political market, but most of them are not. Most of them have only a local impact, but a few may even capture the international attention.

Some policy issues have a longer time horizon than the ones of the alternation of political parties in power or of authoritarian governments.[21] They involve the definition of procedures and the distribution of social production and political power that are meant for a long duration. In fact, these issues condition many party platforms or even proposals of groups that are candidates for staying in power as authoritarian governments. We call this process ideological competition, in the same way that political platforms compete within a shorter time horizon.[22] The extension of economic theory to this problem is similar. We could even think that, if party competition occurs under a given ideology, the situation is equivalent to a short run. In the long run, ideologies would also be adjustable and become an instrument for political competition.

If the time horizon is further stretched, there are social procedures meant for an even longer duration, preferably for the life of the corresponding society. This is ethics. Rules of right and wrong evolve with universal applicability. They are functional for the survival of

---

[20] Sanson (1986) uses this kind of argument to discuss questions related to urban concentration in Brazil.

[21] In some extreme cases, the time horizon of authoritarian governments may be shorter than in a democracy, as it did in some Latin American countries a few years back.

[22] See North (1981, ch.5) for a look at ideology as a means to lower transaction costs in market transactions and social decisions. Carnoy (1984) presents a convenient summary of the ideas of Antonio Gramsci on ideology, which seem to have a longer run view as compared to Douglass North's. When dissociated from its revolutionary discourse, the Gramscian theory looks somewhat similar to what we present here. In a few words, an incumbent ideology, at service to a hegemonic group, may suffer the competition of another ideology at service to another group. The theory was originally meant to explain the rise of fascism in Italy, but it could as well be used to explain the fall of the Soviet Union.

societies.[23] These principles transcend the duration of ideologies, which are mainly an instrument of political power for groups that alternate in the political process. There are ethical principles that survive through the millennia, some of them being part of the most important religions. However, given their generality and their very long time horizon, they may sometimes lag behind the evolutionary process of the corresponding societies, eventually creating disadvantages for the survival of the respective institutions.[24]

The competitive process among different ideologies and ethical amendments should be described by evolutionary principles. As mentioned above, the competition among political platforms has been described by models from neoclassical economics, which involve the notion of equilibrium and, therefore, predictability. In order to avoid this mixture of methodology, we could think of the whole economic and political process in evolutionary terms. The equilibrium positions would be at most focal points in the evolutionary process. However, this kind of theory is still on the making.[25] If it helps the reader, the mixture of equilibrium and evolutionary methodologies has also been successfully applied in biology, especially by Alfred Lotka and J.Maynard Smith (Cronin, 1991). As long as better alternatives in social sciences are not developed, the mixture of methodologies can still yield good insights.

Ethical questions have been recently raised in connection with the patterns of consumption and population growth due to their environmental impact.[26] Increased concern with these questions could eventually lead to changes in the predominant anthropocentric ethics of consumption. In fact, these proposals are like competitive goods that could eventually find their space in human mind. We may alternatively think about ethics and

[23] In evolutionary theory, this requires choosing between group selection and genetic selection, the latter being roughly equivalent to the individualistic approach in social sciences. In fact, the unit of analysis of neoclassical analysis is the individual, with the meaning of a representative agent, that is, a kind of average behavior. See Cronin (1991), Kirman (1992), and Hodgson (1993).

[24] These are the lock-in effects mentioned by Söllner (1998).

[25] Hodgson (1998, p.185) mentions Thorstein Veblen, Friedrich von Hayek, and Douglass North. See also Khalil (1998).

[26] For an ethical approach on consumption versus ecology, see Dasgupta (1998).

ideologies as public goods that are part of the set of procedures collectively used to regulate social life.[27]

The proposal of Boulding (1966) for consumption minimization can be seen as one of many possible ethical proposals. If they win the minds of the human species in the future, inducing changes in consumption preferences, new systems of incentives would evolve in line with those objectives. If the worst predictions of some neo-Malthusians are realized, the discussion and adoption of new ethical views might be the only hope for the human species. If they are wrong, even the most optimists might concede that the time horizon of high consumption of natural resources is finite. Again, at least the discussion of ethical views is important, but, of course, in a much more relaxed mood. The main trouble is that the degree of uncertainty in all predictions on natural resource exhaustion is very high.

The time horizons of political platforms, ideologies, and ethics are thus part of the time horizon of cultural evolution. In a still longer run, there is the genetic evolution.[28] The genetic inheritance from the time humans were simply hunters might adjust to the present environment, which is based on the intensive use of agricultural techniques and on an industrial system that feeds on stocks of low entropic energy. But of course, with the present scientific knowledge, any prediction as to which direction humans will evolve is highly uncertain. In fact, experts on the use of complexity theory for social and natural phenomena would argue that any prediction would be impossible for such a long run.[29]

---

[27] See Faber, Manstteten, and Petersen (1997), and Söllner (1998), who start from a political viewpoint. See also Faber, Manstetten, and Proops (1998). Robinson and Srinivasan (1997), for example, define ethics as a public good.

[28] Faber, Manstetten, and Proops (1998) define evolution in such a way as to also include a time horizon for inorganic matter. It would be the longest of them all. The fact that consumption decisions may be taken under a given culture, or that ideological competition may occur under a given ethics, means that the LeChatelier principle from physics might be applicable. Starting with Samuelson (1947), and by using the mathematics of this principle, economists have shown, for example, that a long-run demand may have a different price-elasticity as compared to a corresponding short-run demand. Inspired in this idea, which is formally obtained from optimization problems, we could say that a political, platform-based decision over natural resources would be different, perhaps better adjusted to desirable ends, if the dominant ideology and ethics of the society were also adjustable. But longer run adjustments, by the very definition of different time horizons, take more time to be made.

[29] See Rosser (1999) for a critical review of complexity theory in economics.

Conclusion

We saw the process of social decisions as embedded in genetic and cultural evolution. When we break down the time horizon of social decisions into progressively shorter periods of time adjustment, we may distinguish several types of institutional determination on how societies take decisions, as a group and individually. These decisions include consumption matters. The postulate of maximizing an index of preference, under the nonsatiety assumption, is reasonable for an aggregate approach and should not be blamed as the culprit of the possible fall of humankind into a cliff of natural resource exhaustion. It simply reflects the predominant ethical values, of which ideologies, political platforms, and demand patterns are shorter run adjustments.

When collective decisions on public goods and on externalities, and even on the institutional apparatus that influences patterns of private consumption, show evidence of leading to the exhaustion of means of long run survival of the human species, attempts at proposals for social engineering might have their way in. These proposals may defend shortcuts in the evolution of institutions, sometimes based on not well-established scientific knowledge about the social processes. They might yield unpredictable results, although in the end they are a part of the cultural evolution of humankind. Some of them are equivalent to a genetic variation. Despite many of these changes being evolutionary failures, they are part of the process of generating new ones.

If predator-prey phenomena are identifiable, then some predictability is involved. Well-informed proposals for institutional reform, in the sense of being based on hard scientific evidence, could have predictable results. Perhaps development in scientific knowledge might also help in evaluating current successful institutional arrangements, at least in predator-prey situations. These arrangements include private property, with its incentives for resource preservation in some cases, and democratic public decision making, with its faster adjustment to changes in opinion of societies. But there are those who accuse precisely these institutions of being the instruments for driving humankind to fall down the cliff. Unfortunately, scientific knowledge in the social sciences is not developed enough so as to having fewer theories to survive tests against reality. And, of course, there are those who say that we will never have such a scientific progress due to the kind of phenomena we study.

To end this work, we could bring back the introductory statement that, if we rejected individual preferences as the basis for economic theory, we should make explicit whose preferences we are putting in place of them. The Easter Island civilization was successful for almost a thousand years, but when the exhaustion of resources started to set in, speeded up by a drastic climatic change, it seems that they made a wrong diagnosis of the cause of resource shortage. They thought the low level of raining caused the shortage in log availability. The religious solution of statue carving did not perform well and their civilization collapsed after a relatively short period. Perhaps, as suggested by Brander and Taylor (1998), better scientific knowledge on forestry and on the working of institutions would have meant a different evolutionary path. Therefore, their institutions and the resulting structure of preferences concerning the use of natural resources were inadequate for the survival of the Easter Island society.

The Gaia hypothesis sees the whole Earth as part of an evolving universe, defining the destiny of all living things in this spaceship.[30] If, well informed by science, we could go somewhat against this process, by affecting the evolution of social institutions, we might at least postpone our end for a much longer run. Robert Solow's position, which reflects a highly influential viewpoint in economics, is that beyond the time horizon of standard growth models, perhaps adjusted for endogenous population growth and technological progress, economics has little to say. In a way, we also conclude that this is really a task for politicians and philosophers. But since Solow-type growth models only look forward, it means that this time horizon, though being relatively short, has the starting points continuously being pushed forward. Well, this might still be interpreted as a car going towards the edge of a cliff, driven by a shortsighted driver. When the driver sees the edge of the cliff, it might be too late for braking, unless the speed of the car is, just by luck, safely low.

References

BARONE, Enrico. The ministry of production in the collectivist state. In: HAYEK, F.A. (ed.) *Collectivist Economic Planning.* London: George Routledge & Sons, 1935. Originally published in Italian: 1908.

[30] See Lovelock (1979) and Faber, Manstetten, and Proops (1998).

BERGSTROM, Theodore C. Economics in a family way. *Journal of Economic Literature*, vol.34, n.4, p.1903-1934, Dec.1996.

BOULDING, Kenneth E. The economics of the coming spaceship Earth. In: JARRET, H. (ed.) *Environmental Quality in a Growing Economy*. Baltimore: The Johns Hopkins Press, 1966.

BOULDING, Kenneth E. *Ecodynamics: A New Theory of Societal Evolution*. Beverly Hills: Sage, 1978.

BRANDER, James A.; TAYLOR, M. Scott. The simple economics of Easter Island: A Ricardo-Malthus model of renewable resource use. *American Economic Review*, v.88, n.1, p.119-138, Mar.1998.

CARNOY, M. *Estado e Teoria Política*. Campinas: Papirus, 1986. Originally published in English: 1984.

CRONIN, Helena. *A Formiga e o Pavão: Altruísmo e Seleção Sexual de Darwin até Hoje*. Campinas: Papirus, 1995. Originally published in English: 1991.

DALY, Herman E. The circular flow of exchange value and the linear throughput of matter-energy: A case of misplaced concreteness. *Review of Social Economy*, v.43, n.3, p.279-297, Dec.1985.

DALY, Herman E. (ed.) Special issue: The contribution of Nicholas Georgescu-Roegen. *Ecological Economics*, v.22, n.3, Sep.1997.

DASGUPTA, Partha. Population, consumption and resources: Ethical issues. *Ecological Economics*, v.24, n.2/3, p.139-152, Mar.1998.

DAWKINS, Richard. *O Gene Egoísta*. Belo Horizonte: Itatiaia; São Paulo: Ed.da Universidade de São Paulo, 1979. Originally published in English: 1976.

DAWKINS, Richard. *The Extended Phenotype: The Long Reach of the Gene*. San Francisco: W.H.Freeman, 1982.

DAWKINS, Richard. *The Blind Watchmaker*. London: Penguin Books, 1988.

DEBREU, Gerard. *Theory of Value*. New Haven: Yale University Press, 1959.

DIAMOND, Jared. *Guns, Germs, and Steel: The Fates of Human Societies*. New York: Norton, 1997.

FABER, Malte; MANSTETTEN, Reiner; PETERSEN, T. Homo oeconomicus and homo politicus, political economy, constitutional interest and ecological interest. *Kyklos*, v.50, n.4, p.457-483, 1997.

FABER, Malte; MANSTETTEN, Reiner; PROOPS, John. *Ecological Economics*. Cheltenham: Edward Elgar, 1998.

FISHER, Irving. *The Theory of Interest*. New York: Macmillan, 1930.

FOLEY, Duncan K. Stabilization of human population through economic increasing returns. *Economics Letters*, v.68, p.309-317, 2000.

GEORGESCU-ROEGEN, Nicholas. *The Entropy Law and the Economic Process*. Cambridge, Mass.: Harvard University, 1971.

GEORGESCU-ROEGEN, Nicholas. Closing remarks: About economic growth – a variation on a theme by David Hilbert. *Economic Development and Cultural Change*, v.36, n.3, suppl., p.S291-S307, Apr.1988.

HODGSON, Geoffrey M. *Economia e Evolução: O Regresso da Vida à Teoria Económica*. Oeiras: Celta, 1997. Originally published in English: 1993.

HOGSON, Geoffrey M. The approach of institutional economics. *Journal of Economic Literature*, v.36, n.1, p.166-192, Mar.1998.

KHALIL, Elias L. The five careers of the biological metaphor in economic theory. *Journal of Socio-Economics*, v.27, n.1, p.29-52, 1998.

KIRMAN, Alan P. Whom or what does the representative individual represent? *Journal of Economic Perspectives*, v.6, n.2, p.117-136, Spring 1992.

KRAUTKRAEMER, Jeffrey A. Nonrenewable resource scarcity. *Journal of Economic Literature*, v.36, n.4, p.2065-2107, Dec.1998.

KREMER, Michael. Population growth and technological change: One million B.C. to 1990. *Quarterly Journal of Economics*, v.108, n.3, p.681-716, Aug.1993.

LANGTON, Christopher G. (ed.) *Artificial Life.* Redwood City: Addison-Wesley, 1989. Cited by Rosser (1999, p.177).

LINTOTT, John. Beyond the economics of more: the place of consumption in ecological economics. *Ecological Economics*, v.25, n.3, p.239-248, Jun. 1998.

LOVELOCK, A.J. *Gaia: A New Look at Life on Earth.* Oxford: Oxford University Press, 1979.

MAGEE, Stephen P. Bioeconomics and the survival model: The economic lessons of evolutionary biology. *Public Choice*, v.77, p.117-132, 1993.

MARTÍNEZ-ALIER, Joan. *Da Economia Ecológica ao Ecologismo Popular*. Blumenau: Editora da FURB, 1998.

MAYUMI, K.; GIAMPIETRO, M.; GOWDY, J. M. Georgescu-Roegen/Daly versus Solow/Stiglitz revisited. *Ecological Economics*, v.27, n.2, p.115-117, Nov.1998.

MILLER, Gary J. The impact of economics on contemporary political science. *Journal of Economic Literature*, v.35, n.3, p.1173-1204, Sep.1997.

MONOD, Jacques. *O acaso e a necessidade.* Petrópolis: Vozes, 1976. Originally published in French, 1970.

NORTH, Douglass C. *Structure and Change in Economic History.* New York: Norton, 1981.

NORTON, Bryan, COSTANZA, Robert, BISHOP, Richard C. The evolution of preferences: Why 'sovereign' preferences may not lead to sustainable policies and what to do about it. *Ecological Economics*, v.24, n.2/3, p.193-211, Mar.1998.

PASSET, René. *Principios de Bioeconomía.* Madrid: Fundación Argentaria, 1996. Originally published in French, 1979.

PORTNEY, Paul R. Environmental problems and policy: 2000-2050. *Journal of Economic Perspectives*, v.14, n.1, p.199-206, Winter 2000.

ROBINSON, J.A., SRINIVASAN, T.N. Long-term consequences of population growth: technological change, natural resources, and the environment. In: ROSENZWEIG, M.R.; STARK, O. (eds.) *Handbook of Population and Family Economics.* New York: Elsevier, 1997. Vol.IB, ch.21.

ROSSER, J.Barkley, Jr. On the complexities of complex economic dynamics. *Journal of Economic Perspectives*, v.13, n.4, p.169-192, Fall 1999.

RUTTAN, Vernon W. Cultural endowments and economic development: what can we learn from anthropology? *Economic Development and Cultural Change*, v.36, n.3, suppl., p.S247-S271, Apr.1988.

SAMUELSON, Paul A. *Foundations of Economic Analysis.* Cambridge, Mass.: Harvard University Press, 1947.

SAMUELSON, Paul A. Modes of thought in economics and biology. *American Economic Review*, v.75, n.2, p.166-172, May 1985.

SANSON, J.R. O Estado e a concentração urbana. In: ENCONTRO NACIONAL DE ECONOMIA, 14th, Brasilia, Dec. 1986. *Proceedings* ... Rio de Janeiro: ANPEC, 1986. Vol. 1, p. 433-451.

SMITH, Vernon L. Economic principles in the emergence of humankind. *Economic Inquiry*, v.30, n.1, p.1-13, Jan. 1992.

SÖLLNER, F. Who needs homo politicus? A note on Faber, Manstetten and Petersen. *Kyklos*, v.51, n.3, p.417-425, 1998.

von NEUMANN, John. A model of general equilibrium. *Review of Economic Studies*, v.13, p.1-9, 1945. Originally published in German, 1938.

WILSON, Edward O. *Da Natureza Humana.* São Paulo: T.A.Queiroz/Univerdade de São Paulo, 1981. Originally published in English: 1978.