

THE LOGIC OF THE BIOSPHERE,
THE LOGIC OF CAPITALISM -
NUTRITION IN LATIN AMERICA

by José Carlos Escudero
Universidad Autónoma Metropolitana
Xochimilco - Mexico. *

To be presented at the Conference on
Political Economy of Health and Disease
in Africa and Latin America, Oaxtepec,
Mexico, January 8-11, 1985.

Sponsored by the Joint Committees on African
and Latin American Studies of the Social Sciences
Research Council (USA) and by El Colegio de
Mexico (Mexico).

* Address: Apartado Postal 22-444. Mexico 22. Mexico

I)

INTRODUCTION

R

As Levins has observed, "The most surprising fact about agriculture is that it sometimes feeds people, that hunger is not more widespread than it is"... "food production is not engaged to feed people, food does not flow from well fed areas to hungry areas, fluctuations in food production do not follow changing needs" (Levins 1969). As has also been noted, the most significant recent trend in agriculture

has been the massive shunting of grain into animal fodder (in 1972-74, 43% of the world's grain production was destined for fodder, an amount which could provide a reasonable diet for 2 500 million humans) (Escudero, 1983), and of fish into animal feed (less than 10% of the world's catch just before World War II, 50% by 1967 (Holt, 1969). Such thermodynamical and biological madness is the central argument of what follows, and can be explained most significantly - though not exclusively - through analysing the dynamics of Capitalist accumulation (Escudero, 1983). Nutritionally, the fundamental net result is the production of hypercaloric and hyperlipidic diets for the rich, which kills them through a roundabout mediation of degenerative diseases, and of starvation diets for the poor, which kills them fairly straightforwardly through the mediation of infectious, parasitic and carencial diseases.

R

These introductory remarks can be useful to start my response to Kathryn Dewey's Paper (Dewey, 1984). My argument would attempt to work, as it were, at both extremes of the area which Ms. Dewey so usefully covers: at one extreme, the framework within which, in my view, nutritional developments in Latin America must be placed; at the other extreme, what can be done to combat what objectively constitutes a horrifying - an increasingly horrifying - situation. Elements of the former analysis are: a) the nutritional consequences for Latin America of the development of the Capitalist "World system" and b) the process of commodification of the commodity-food; elements of the latter analysis are the technical and political constraints that stand in the way of recognizing and combatting human malnutrition in an effective way.

R

There is, however, another perspective for reading what follows: the existence of a "logic of the biosphere": the product of three billion years of evolution of life in our planet, one of whose end products has been human life. This -

logic encompasses what is sensible - in terms of economy of resources of the biosphere - in order to allow "homo sapiens" to subsist and thrive. Against this logic another can be posited; the "logic of Capitalism" or **rather** the logic of its accumulation. Both logics pursue different ends, these ends can be incompatible, and human nutrition in our planet is perhaps an extreme expression of this incompatibility. Both the capitalist world system and the commoditization of the commodity-food provide enough empirical examples to show the illogical nature - in biological terms - of the particular mode of production which is dominant in the great majority of the Latin American countries.

II)

THE FRAMEWORK

A) NUTRITION IN LATIN AMERICA AND THE CAPITALIST WORLD SYSTEM

This process started in the late XV Century, with the "discovery" of America, and with its integration with the not yet well known but contiguous European - Asian - African landmass. Though, the development of a worldwide communication network, the subordination - and sometime the destruction - of pre-capitalist Latin America, the diffusion of a certain epistemology, a certain technology, "culture" and societal organization, this process produced **momentous** consequences for "homo sapiens" worldwide: from the worldwide homogenization of a certain disease immunity profile (Mc Neill, 1976) through **the** diffusion of plants and animals to wherever they could find an accommodating ecological niche, (thus tending to maximize the ecological efficiency of the planet as a whole), to an enormous and largely unmeasured amount of human suffering. Some figures on this latter phenomenon can however be quoted.

The population of the Americas by 1500 was perhaps equal to that of Europe, by 1600 it was one tenth of that (Davis, 1977); in other words, the approximately 50 million **A**merican aborigines at the beginning of the European settlement had dwindled to about 4 million in the XVII Century (Magdoff, 1974). For Mexico, alone, the estimated 25 million pre-Cortez became half that figure in 1540 and one million by the end of the Century (Davis, 1977). The population in the Peruvian coast dwindled from 250 000 in 1570 to 87 000 in 1620; that in the highlands from over a million to 585 000 in the same dates (Wetchtel, 1983).

At least 9.5 million African slaves were imported into America to satisfy the needs of an expanding Capitalism by replacing those Amerindians who had died.

(Moreno Fraginals, 1977). Of them, 15 to 20% died during the Atlantic crossing alone (Rodney, 1982); of their children born in America only about 10%, on the average, reached adulthood (Moreno Fraginals, 1977).

P More specifically, the theoretical framework within which historical nutrition in the Americas is placed lies in that particular branch of Marxist thought which has dealt with the center-periphery dialectic of Capitalism, a subject towards which Marx and Engels had paid little attention, or from which they had sometimes drawn the wrong conclusions (Note 1)

These studies started in this century with Hilferding (1910) - if one accepts that Hobson (1902) was not a Marxist - and proceeded with Rosa Luxemburg (1913), Lenin (1917) and others.

P A common link in these views (eventhough they may differ significantly in other areas) is a characterization of Capitalism as a dynamic predatory force in territorial terms, which from its foci in Western Europe, European Russia, areas of settlement of European colonists elsewhere and Japan, invaded non-Capitalist (pre-Capitalist) societies, reshaping them - or destroying them - for its benefit, and drawing from them an enormous amount of economic surplus, which in turn it uses to increase its own dynamism. The rise of a polycentric Socialism at the end of WWII (China, Yugoslavia, Albania) with the ideological consequences of polycentrism, the intellectual thaw which followed the end of Stalinism, and the increasing contradictions within Capitalism itself - especially in its periphery - have produced a significant renaissance in Marxist thought (Note 2), and the "center - periphery" dialectic was taken up, among others, by the "dependentistas" in Latin America (Note 3), and by certain European and Afro-Asian scholars (Note 4). A current rewriting and reshaping of the center - periphery dialectic can be seen in the works of Immanuel Wallerstein (Wallerstein 1979, 1980, 1983 a, 1983 b) (Note 5).

Food Production Data

P Nutritional data are hard to find even today, and in historical studies the problems are multiplied a hundredfold. In an indirect way, it can be stated that nutrition in pre-Columbian America was adequate for a population estimated at about 25 million in Mexico alone, while one must remember that the concept of adequacy in nutrition is largely epidemiological, and thus quantitative, not qualitative.

Plant domestication started in the Americas, probably at various foci, at around 5 000 BC in Mesoamerica and 4 000 BC in Peru (Cipolla, 1978), and by the time of the European invasion it had spread from what is now the United States to northern Chile and Argentina. Two cultivated plants - maize and potatoes - were the basic nutritional staples, and became significant presents which the Americas gave the rest of the world through the "World system".

P Wheat, rice, sugar cane, cotton, barley, tea, coffee, many fruits and large mammals were unknown in the Americas before the Spanish invasion of 1492. The continent was by far the largest landmass set apart from the -largely- ecologically homogeneous (in terms of flora, fauna and human immunity to disease) interconnected European-African-Asian landmass. Australasia was similarly isolated, but its smaller size, high percentage of desertified areas and ecological lack of variability made it much less important. The agricultural civilizations of Mexico and the central Andes were quite sophisticated, and the productivity of their main food, crops- maize and potatoes, apparently quite high. Also, the lack of large mammals in pre-Columbian America seems in hindsight to have been a nutritional bonus, in view of more recent nutritional views, as fertile land was used exclusively for agriculture, and its carrying capacity thus maximized for human populations.

P In ecological terms, and "ceteris paribus", the possibility that all of the flora and fauna of the Euro-African Asian landmass could be implanted wherever they could find a suitable ecological niche in the Americas, meant that the carrying capacity of the continent could increase substantially. This could have increased the population of the Americas, but exactly the opposite happened, through a combination of military genocide, societal disruption and the diffusion of plagues for which the natives had no immunity. The tentative figures for this demographic collapse have already been reviewed.

P Through the European invasion of America, a one-way flow of wealth started to arrive in Europe, obtained in great part through the exploitation of imported African slaves when the original populations of the Continent proved unequal to many of the tasks that Capitalism had set to them.. This wealth was transferred mostly in the form of precious metals: food is a bulky commodity, and the seaborne carrying capacity was not large until the great --

mercantile fleet expansion in the XIX Century, which increased from 9 m. tons in 1850 to 30 m. tons fifty years later (Cipolla, 1978). It was only then that the impact of imported food into Europe became significant for large masses of its population, although improvements in the European diet became apparent immediately after the Europeans set foot in the Americas.

P

We see, thus, how the integration of the "world system" under Great Britain (the winner over Spain, the Netherlands and France as center of the system) provided a setting for the application of comparative ecological advantages worldwide, a counterpart to the comparative advantages of economics, which the "invisible hand" of the market was supposed to allocate for the benefit of all, in reality for those who, in the center of the system, controlled the master strategy. Those areas which could worldwide provide certain food staples most efficiently: the humid tropics, the Argentine pampas, the US midwest, the Australian southeast, the Russian steppes, became linked through an invisible web which is today even stronger, although the center of the "world economy" has moved elsewhere. The respective roles of these areas were strengthened by the provision of capital and the infrastructure it could provide: railways, agricultural equipment, ports; and in some cases too, European-style armies and legal systems. By 1844-1953 Russia exported about 11.5 million hectolitres of grain per year, in the second half of the 1870s it exported between 47 and 89 million. The US exported perhaps 5 million hectolitres annually in the 1840's, by the second half of the 1870's the figures were more than 100 million (Hobsbawm, 1977). Cuba provides a national case study of its agricultural insertion into the "World Economy", and of its rapid pace: 38 000 tons. of cane sugar in 1806, 73 000 in 1826, 113 000 in 1836, -- 209 000 in 1846, 348 000 in 1856, 612 000 in 1866 (Bosch, 1981). World trade between the major nations increased from 20 m. tons in 1840 to 88 m. tons. in the 1870s (Hobsbawm, 1977). The expanded and more efficient communications network meant that the cost of mobilizing grains decreased precipitously. Shipping eight bushels of wheat from Chicago to Liverpool cost eleven shillings in 1869-79, and was below three shillings in 1902 (Wolf, 1982).

On the receiving side of this integration, historical evidence points towards increasingly varied diets due to importation, although a massive impact (in terms of calories) did not take place until the second half of the XIX Century . Chocolate started being exported massively to Europe in 1600 (Braudel, 1974). Consumption of cane sugar in the United Kingdom rose fifteen times from 1700 to 1800, being then 150000 annually (Braudel, 1974), and kept increasing later : per capita consumption was about 17 lbs. in 1844 and about 60 lbs. in 1876 (Hobsbawm, 1969). All of Europe's consumption of coffee was 4 million pounds in 1739, fifty years later the island of Santo Domingo alone produced 40 million pounds (Braudel, 1974).

By 1846, the repeal of the protectionist British Corn Laws flooded that country - a model of the newly developing Industrial Revolution, and one which set examples for others to follow- with cheap imported food, mostly grain, both for direct human consumption and as fodder : meat consumption per head increased by one third between 1870 and 1896 (Hobsbawm, 1969), and fruit, first in the form of jam and then of bananas started becoming a nutritional staple of the British working classes (Hobsbawm, 1969). Some comments can be made on these developments. One is that the repeal of the Corn Laws spelt ruin for British agriculture and the landed gentry that drew its strength from it, confirming the truism that the dominant needs of Capitalism as a whole (in this case, the possibility of keeping industrial wages low through cheap imported food) are not necessarily those of all its components; the other is that the British center of the "World economy" ended by having a remarkably varied and cheap diet. This diet, which had a substantial component of meats, was maintained until World War II, when it was substituted by a much more monotonous but not less nutritious

carbohydrates and milk diet. If, by the 1930s Britain imported 70% of its food calories, 84% of its sugar and fats, 88% of its wheat and flour, 91% of its butter, (Escudero, 1978a) (Garcia and Escudero, 1982); during World War II arable acreage increased by 50% and calorie production of home produce doubled (Hobsbawm, 1969) with a more than doubling of production of wheat and potatoes (Escudero, 1978a). The fact that the nutrition of the British people actually improved during the war, despite the prevalent nutritional austerity, proves once again the enormous leeway that a nutritional policy for combatting malnutrition can provide in spite of adverse circumstances - a lesson to be recalled today, when nutritional levels are deteriorating everywhere in the Capitalist periphery

Nutrition in Europe improved steadily from the XVIII Century onwards, a phenomenon partly due to the importation of food. The improvement can only be traced through indirect indicators: mortality, which started to decrease in that century, and accelerated its decrease in the next one; such punctual indicators as a steadily lower age of onset of menstruation in French women from 1750 onwards (Shorter, 1981).

It would be too symmetrical, facile, and also inaccurate to say that to this improved feeding of the center of the "World system" would correspond an increased malnutrition in its periphery- including Latin America. Again, nutritional data are lacking - let us remember that nutrition only started being scientifically measured in this century- and we must use mortality data - as we often do now- as a reductionist indirect indicator of the historical evolution of nutrition in Latin America. Those human groups there that were subject to particularly brutal forms of exploitation - African slaves, for instance- showed very high mortality rates, and in them

malnutrition must have played a significant role. On the other hand, all of the countries of the Americas experienced sustained population growths after the initial demographic shock, both from endogenous growth, in which decreasing mortality was the dominant factor, and from immigration: voluntary from Europe (55 million Europeans left that continent in the hundred years after 1820, the vast majority of them going to the Americas (Magdoff, 1974), and semi-compulsory from Asia as indentured laborers, plus a dwindling slave trade; all these phenomena pointing to an increased carrying capacity on the part of the Continent, and indirectly to improved nutritional levels there. The voluntary migrants largely went to countries with a mobile agricultural frontier in the Temperate Zone, whose exported products were sent to Europe, thus consolidating the overall success of the "World system". Incidentally, the countries of expulsion of the emigrants were left with more or less the number of inhabitants that were functional for their own economic accumulation, and which minimized social unrest in them (Note 6)

With little data on nutrition, arguments on its prevalence and trends in Latin America must take a theoretical rather than an empirical form.

Trends in the "World system" and in nutritional levels in Latin America

A great controversy exists on whether post-Columbian Latin America became immediately integrated into the "World system" in a Capitalist fashion, or whether it kept a significant pre-Capitalist component, which in human nutrition would correspond - though of course not linearly - to subsistence economies, to nutritional self-reliance and, more indirectly, to the satisfaction of nutritional needs. Scattered but increasingly powerful data point to the fact that populations left alone take care of their nutrition, and that (surprisingly for those who, some decades ago, wrote that what

Latin America needed was a diffusion of the "modern" into the "traditional" sector of the economy), the more "modern" and "integrated" a Latin America peasant economy is, the worse off it is nutritionally. (Note 7) . The articulation of modes of production in Latin America has been discussed to exhaustion by social scientists, in a debate which I feel Nutrition and Public Health people can only enter at their peril. A synthesis that can be useful here is that put forward by Mandel, who defines the Capitalist World economy as " an articulated system of Capitalist, semi-Capitalist and pre-Capitalist relations of production, linked to each other by Capitalist relations of exchange, and dominated by the Capitalist World market" (Mandel, 1978). Such "modern" madness as the massive use of grain as fodder, of fish as animal feed, the development of junk foods, and the replacement of maternal lactation by artificial milks, all these processes taking place on a worldwide scope, are (also) the result of the increased homogenization and the increased integration of all non-Capitalist modes of production into a Capitalist "World system", whose dynamics and whose crisis are more evident than ever.

We have seen that the Americas, through the European invasion, suffered a massive process of what has come to be called " original disaccumulation": an enormous surplus obtained in the Americas which was transferred to the various metropolis, to be transformed there into capital (Semo, 1973). From then on, the process of nutrition in the Americas was quite complex, and one must not discount (as so many people in the orthodox Left do) the enormous development of productive forces that Capitalism has developed, which after the initial shock of conquest, increased the population of the Continent, decreased its mortality, and most likely increased its nutrition globally until recently; to a large extent through the cultivation of previously virgin areas, in the process described above

as one of "ecological comparative advantages".

This phenomenon appears to have ended. The integration of the "World system" has proceeded steadily since its beginning in the late XV Century. The appearance of Socialist states since 1917 has certainly weakened it, but its hold upon the remainder of the world appears now to be greater than ever, as witnessed by such new historical developments - in our field of interest- as international agribusiness, which has come under scrutiny only in the last decade or so (Robbins,1974)(George, 1977) (Tudge, 1977) (Moore Lappe and Collins, 1977) (Barkin and Suarez, 1981) (Bessis, 1981)(Tricontinental,1982) (Echeverría Zuno,1982).

Nutritionally, the effects of national policies towards agricultural self sufficiency and an egalitarian distribution of food, which seem to be characteristics of Socialist nations (although the problem is more complex, see Note 8), seem to have provided good results in terms of minimization of human suffering through death, illness or malnourishment. Nutritionists do not often read what demographers produce, and vice versa, which is a pity for both, as recent demographic developments would throw light on the efficacy of the health and nutritional policies underlying them. Two cases in point are the sharp decreases experienced by the mortalities of Cuba and China in the last decades. Cuban mortality is now the lowest in Latin America, having surpassed those of Costa Rica, Argentina and Uruguay, which had previously lower figures- the two latter countries being also synonymous with fertility of soil, and with "rich" - i. e. animal protein diets for at least part of their populations. The Cuban infant mortality figures in 1979 were 19.4 per thousand, life expectancy in 1973 was 73.5 years. The validity of these figures is supported by a statistical system of high quality

11.

(Escudero, 1981a). The precipitous decline of mortality in Cuba after 1959 is even more significant than what its government takes credit for, as pre-Castro Cuba tended to undercount its mortality (Escudero, 1981a). This mortality decline has been due to various causes, among them a nutritional improvement which appears to have been largely quantitative: the structure of the Cuban diet appears not to have changed, its quantity is certainly larger and it is far better distributed.

Chinese mortality improvements after 1949 are remarkable, and constitute a sort of demographic world record. Life expectancy at birth for both sexes was of 47 years in 1950; it was of 70 years in 1982 (Keyfitz, 1984) : an increase of four fifths of a year in every calendar year over a thirty year span. The Chinese achievement has not been linear, and increases of mortality and punctual famines were reported during the Cultural Revolution (Bernstein, 1983) (Stavis, 1983) (Sen, 1982). Yet, the available literature is unanimous in reporting improvements in bodily size in children (Stavis, 1982a) (Craviotto, 1974) (Tissier, 1982) ; and on the existence of a food allocation system based on egalitarian or quasi egalitarian principles (Stavis, 1982b) (Tissier, 1982) . Two further comments can be made: one is that the Chinese diet appears to be overwhelmingly carbohydrate-based, and most of the animal inputs in it appear to be provided by porks which are raised largely on refuse, thus not competing with humans for grain and incidentally recycling pollutants (Tissier, 1982). The 200 million urban chinese are fed largely with 50 million tons of grain per annum (Keyfitz, 1984). The second comment is that China's mortality is now lower than Argentina's, a country with many more natural resources, a much lower population pressure, and one that is very closely integrated into the "World system" : to the extent that animals in Western Europe and in the Soviet Union are

largely fed with fodder from Argentinian grain (Escudero, 1984b).

At this point the analysis must end. The Latin American foreign debt has increased tenfold in ten years: from 35 billion dollars in 1973 to 350 billion in 1983. The existence of the debt is another example of the functioning of the "World system"; the petrodollars which appeared after the increase in oil prices in 1973 had to be recycled somewhere, and loans that now compose the debt were made to the Latin American countries, most easily to those countries run by military dictatorships which had been set up with United States political and financial support.

The existence of the debt and the (upward) sliding interest rates that must be paid on it, suggest that the nutritional situation of that part of Latin America that is most closely integrated with the "World system" will keep on deteriorating. More fodder, fruit, shrimp, flowers, marijuana and vegetables will flow from the periphery to the center; satisfying the double need of lowering living costs and improving "wellbeing" in the central countries (an important consideration in countries where consensus is a requisite for governing) ; and of shaping the productive capacity of the periphery to satisfy the needs of the center and the integration of the whole . The way out of this "impasse" lies exclusively in the realm of politics: enough is now known about nutrition and economics - if this were applied - to guarantee to almost every country in the world the best nutritional level. No political forecast can be made now, and indeed the path of humanity has not been a linear one towards improvement, as the XIX Century confidently believed; so that great catastrophes are a possibility. With a nearer forecast horizon, movements towards autarky in countries (coming even from unlikely areas of the political spectrum) are perhaps going to become more common.

B. THE COMMODITIZATION OF FOOD IN THE LATIN AMERICAN COUNTRIES

The locus of the analysis, which was worldwide in the previous section, now shifts to within each Capitalist country. Capitalism is a very peculiar mode of production which, differently from its predecessor modes, has the goal of unending accumulation. As Wallerstein notes, "far from being a "natural" system, as some apologists have tried to argue, historical Capitalism is a patently absurd one. One accumulates capital in order to accumulate more capital. Capitalists are like white mice on a treadmill, running ever faster in order to run still faster. In the process, no doubt, some people live well, but others live miserably; and how well and for how long do those who live well live?" (Wallerstein, 1983 b). This, put into nutritional terms has momentous consequences, as unending accumulation would eventually demand resources far beyond those provided or providable by the biosphere: if current worldwide production of foodstuffs can now assure every inhabitant of the planet - including children- a daily diet of 3000 kilocalories and 65 grams of protein (Condamines, 1982), but distortions which are structural to Capitalist accumulation prevent this from happening (Escudero, 1983 an ultimate Capitalist example of application of its logic to the problem of human nutrition could be the provision of barbecues of nightingales' tongues to those who would be willing to purchase them. As we have seen, the trends are for the increase in the use of grain as fodder and of fish as animal meal.

Increased commoditization of food can be explained at different levels and using different explanatory models. As Gorz has said, Capitalism tends towards " the extension of market relations into all areas of personal and social life" (Gorz, 1980). More economy-oriented explanations would point to such spurs towards commoditization as a reduction in rates of profit and a tendential increase in the organic composition of capital; a nutritional

viewpoint would stress the fact that food is a very basic human need, from which little profit can be extracted if the economic distance between producer and consumer is small. As human needs of food are fundamentally inelastic, the tampering of foodstuffs to increase their exchange value - at the expense of their use value- becomes essential. (Escudero, 1983). Thus, "the biscuit becomes the chocolate biscuit, the chocolate biscuit acquires a layer of cream and a dollop of jam, and is sold in a see-through box; and beans, which could be sold by the half-hundredweight in paper sacks, are first converted into imitation meat, to sell by the pound at a price nicely adjusted to that of real meat".(Tudge, 1977).

In terms of grain, and in view of recent findings which suggest that overall calories are the most pressing human demand, amounts (including a portion to be fed to animals in order to obtain essential protein) from 204 kg. of grain per person-annum (Mayer, 1976); through 300-400 kg. (Pimentel and Pimentel, 1979); to 400-500 kg. (Clark, 1968), are held to be sufficient; with these standards, even the most demanding one, malnutrition could be more than eradicated in Argentina with just the national production of wheat, maize, rice and soya, excluding any other foodstuff (Escudero, 1984b). This is in sharp contrast with the high levels of malnutrition prevalent in that country (Puffer and Serrano, 1973) (Kotliar and Escudero, 1973)(Escudero, 1974 ,1975, ~~1976~~^{1981b}, 1984) (Bermann and Escudero, 1978)(Garcia and Escudero, 1982) (Sabulsky, 1983).

Empirical examples of the nefarious nutritional consequences of the commodification of foodstuffs are abundant, and future trends are bleak, in view of the double phenomenon of a crisis within Capital (which would tend to maximize the amount of profit to be extracted from commodities) and of reduced purchasing power of salaries (another symptom of the same crisis). As American examples of the process, the "Cocoa Puffs" of General Mills in the U.S. multiplied

by 25 the cost of its staple, maize (George, 1977); in Mexico, breakfast cereal (heavily publicized) costs 18 times more than its nutritional equivalent of unpublicized tortillas (Warman, 1983).

Commoditization always implies a subordination of use values. Food rationing and subsidies - usual examples of food de-commoditization - improve nutritional levels, as the United Kingdom World War II example, reviewed above, has shown. Cuba, which has now Latin America's lowest mortality and quite likely its best nutrition, has rationing for some basic nutritional staples, a fact which the naive, or the not so naive, point out as an example of nutritional inadequacies. Commoditization is nutritionally deleterious in several ways. Firstly, the systematic response of Capital in the ~~current~~ crisis is to decrease the value of wages : slightly in Western Europe and the U.S, precipitously in Latin America, where the average wage currently has a purchasing power of roughly half of what it had at the onset of the crisis- a decline which started earlier in countries run by authoritarian military regimes (Brazil, Chile, Argentina, Uruguay), but which has also spread to countries with democratic forms of government (Mexico, Venezuela, Colombia, Peru). The effects of this on the purchase of any commodity, including food, are obvious. Another consequence of the crisis is an increase in the percentage of the unemployed and the underemployed in Latin America. Given the process of urbanization and of Capitalist takeover of the countryside, these people have no agricultural plot to fall back to (Mexico would be a partial but significant exception to this). The number of unemployed and underemployed is fairly well known in Western Europe and the U.S., and largely unknown in Latin America, although the consensus is that the figure is both enormous and growing. The consequences of this on the purchase of the commodity-food are again obvious.

The process of commoditization itself, the tampering with a biologically sound product which can be eaten directly with no

harmful health effects, in order to add to its value to increase its exchange value, also often adds to it substances which are at best neutral, at worst directly harmful in nutritional terms. This is a subject about which a copious literature has been gathered, one of whose best sources is the United States Food and Drug Administration. An extreme example - perhaps the most extreme one in the history of human nutrition- of the tampering with a natural nutrition process in the search for profit , is the replacement of natural lactation by artificial milks, a process which has been estimated to cause one million additional infant deaths per year (Stephen, 1981), the overwhelming majority in the Capitalist periphery, including Latin America (Note 9).

III WHAT IS TO BE DONE ?

This seems a reasonable question. Every year malnutrition kills some tens of millions of people, acts as an agent in the production of some thousands of millions of disease episodes, and hampers the bodily growth and the psychomotor development of some thousands of millions of people (Escudero, 1984 b). As seen, malnutrition is a political problem, in the sense that it is not related to the magnitude of the societal surplus, but to the fashion in which this surplus is allocated.

One can begin by stating the things that ought not to be done to combat malnutrition. As we have seen, productivity of the soil "per se" is almost irrelevant, and improvements in agriculture "per se" almost meaningless, as the "green revolution" has repeatedly shown. The following statement, although perhaps extreme, illustrates the situation: "The main effort of agricultural research is the production of marketable commodities that can be sold to farmers- insecticides, fertilizers, or machines mostly. The feeding of people is a by-product of all this, predictable insofar as food is edible,

but a by-product nonetheless, and very uneven across space, time and social class" (Levins, 1969).

Further medical and biological research on the problem also seems uncalled for. We now know enough about the causation of malnutrition, its prevention and treatment, to reduce it perhaps by 95% -more that can be said for almost any other of the important diseases which beset humanity. The paradigmatic cure of malnutrition takes place when one of its usual victims- a marginal urban dweller, perhaps, or a landless peasant, and their families - manages to eat more of what he usually eats, either by having access to land or by having enough purchasing power to buy the commodity-food.

Of the things that can be done to combat malnutrition, an initial step could be the grading of efficient measures according to the political power inputs that they would require (Garcia and Escudero, 1982)(Escudero, forthcoming). As Einstein has said, physics is a much simpler science than politics. Theoretically, studies could be made of the paths that could minimize political power inputs but still produce nutritional benefits.

Although in the long run the process of capital accumulation is structurally antagonistic to the feeding of "homo sapiens" in the biosphere, there exists enough of a leeway within it to palliate almost all (in the Capitalist center), or a substantial amount (in the Capitalist periphery) of the ravages of malnutrition; as the cases of Kerala in India, Mexico and Sri Lanka would indicate. (Note 10). An analysis of non-Marxist populism is out of place here, and, given the magnitude ~~and~~ ^{and} trends of the current crisis, it is hard to predict - or pessimistic to anticipate- what margins for action approaches of this type will have in the future.

What can be done from a technical-technocratic viewpoint is a cheap and quick-reacting system to monitor levels of malnutrition in human communities, to pinpoint individuals who are at special risk, and to provide them with food (a cheap pharmaceutical still, in spite of efforts to the contrary) once a certain danger threshold is reached. The inefficiency of Vital and Health statistics systems as regards malnutrition have already been documented (Escudero 1977, 1980) (Garcia and Escudero, 1982); alternative measurement procedures put forward (Kotliar and Escudero, 1973) (Escudero ~~1973~~^{1975, 1978}, 1984 a); these calculations showing that the problem is seriously underestimated overall, with the greatest underestimations existing where the problem is worst . Proposals to solve this state of affairs have been put forward and extensively discussed elsewhere (Escudero, 1975, 1978, 1984 a , forthcoming) (Sabelli, 1981) (Garcia and Escudero, 1982), and little can now be added to them.

Once this is done, the gruesomeness of the situation becomes evident, and there remains no excuse - in any rational discussion framework- to withhold action (although a rejoinder to this is that the gruesomeness of the situation is clear enough now, with the inaccurate measurements at our disposal). As seen, the resources to virtually eradicate malnutrition are few, and their non-application is as great an indictment on political systems as was the existence of extermination camps on Nazism. Behar's oft-quoted remarks can again be quoted here "If it is agreed that the fundamental role of any society is to ensure the wellbeing of all its members, including their adequate nutrition, then the presence of malnutrition to any significant extent must be interpreted as a failure of that society to perform effectively. This is really the problem we are facing today: it is the structure of society itself that limits the capacity of many of its members to obtain their basic needs, including sufficient quantities of the right kinds of foods, because control over the utilization of resources is concentrated in the hands of a minority "

(Behar, 1976a). Let us comment that the minority Behar mentions is both a national and a planetary one.

If this situation keeps persisting, the discussion must shift to politics: to the strategy and tactics that will make the goal of rational nutrition for humans feasible. As a by-product of the "World system " (politically inadvertent but inevitable), a worldwide communications network and pool of ideas has appeared, and at this moment many victims of malnutrition - both direct, and those whose sense of human dignity is affronted by so much evitable suffering- are pondering at the success of such countries as China and Cuba.

IV) SOME EXAMPLES OF TWO CONFLICTING LOGICS

A) USES OF ENERGY IN AGRICULTURE

The U.S. agriculture is highly productive in terms of yields per area, but it is also highly inefficient in terms of the relationship between inputs and outputs. By 1940, it required four units of energy (mostly fossil fuels) for each unit of nutritional energy produced. By 1970, the proportion had risen to six to one (Steinhart and Steinhart, 1974). In the U.S, three times more energy per head is used to produce food than what is spent per head in developing countries for all energy-consuming activities, including food production (Pimentel and Pimentel, 1979). By contrast, the New Guinea Tsembaga had a production of 15.4 nutritional energy units per unit of input (almost exclusively human labor) (Rappaport, 1975); the Tepotztlan Mexicans studied by Lewis produced 12.6 per one (Pimentel and Pimentel, 1979); maize-growing human power agricultures yielded respectively 11, 5 and 6 to one in Mexico, Guatemala and Nigeria (Pimentel and Pimentel, 1979); rice growing in the Phillipines using the carabao as work animal

yielded 3.29 to one, against 2.45 to one in Japan and 1.55 to one in California (Pimentel and Pimentel, 1979). No one would sensibly advocate the Tsembaga or the Kung as providers of a societal example to be followed in agricultural or nutritional terms - at least not more than the United States - but the figures presented here suggest that the answer to feeding the world's population is likely to be different from that which multinational agribusiness so strenuously proposes, with a little help from the international banking community, and which is in itself an example of the needs of a mode of production which is embarked on an unending path of increasing its benefits. The logic of the biosphere - the maximally efficient use of the sun's energy to feed "homo sapiens" - would suggest differently in some substantial aspects.

Firstly, fossil fuels are a limited resource, a subject which has been discussed to exhaustion in the last decade. Secondly, they are unevenly distributed in the earth's surface, so that countries deprived of them are at the mercy of the providers, if their development strategy relies heavily on them. Thirdly, their use increases pollution, usually of a non-biodegradable type. Fourthly, other components of a U.S. style agricultural package (pesticides and seed hybridization) increase biological vulnerability, including that of the workers who manipulate them.

B) HYPERPROTEINIZATION OF DIETS FOR THE RICH

This is another example of the two conflicting logics. "The global average intake of free energy in food is 2400 kcal. per person per day; multiplied by the world population in 1973, this corresponds to 4×10^{15} kcal per year. Man also consumes plants and animals for clothing, shelter, firewood, papermaking and many other purposes. Leaving these demands aside, man's food consumption alone amounts to almost one per cent of the free energy stored

by all of the plants. It is interesting to reflect on what would happen if man lived as a top carnivore, fancying the meat of cats and sharks. With a 10 per cent retention of free energy at each link in the food chain, he would then be indirectly responsible for the consumption of the entire storage of free energy by present day photosynthesis. Fortunately, man is omnivorous, and he obtains most of his free energy from plants " (Nobel, 1974). This last statement is not true for many countries of the world, especially for the United States, whose food production and consumption patterns are held by some as an example for other countries to follow, and which are indeed followed by upper-income segments of the Latin American population.

As has been shown, an increasing percentage of the world's grains and fish catch are being used as fodder. This phenomenon again corresponds to the logic of Capitalism: the more valorization of the commodity-food through various steps the better in Capitalist terms, so that the "law of value" becomes an explanatory category in human nutrition (Escudero, 1983); as has been succinctly stated " the production of pork, like that of beef, lambs and poultry, is based on the economic advantage for the farmer of selling his crops through animals at a higher profit than he would realize by selling the crops directly for human food " (Pond, 1983). This logic runs counter to the logic of the biosphere: the recommendations for protein and animal protein intake in humans - which could justify this process - have been sharply revised downwards in the last decades (Munro, 1975) (Escudero, 1984 a, forthcoming). The dominant current consensus among nutritionists is that by far the most usual form of malnutrition is caused by a lack of overall energy in the diet, rather than by the lack of any specific component (protein, vitamins, minerals); and that therefore its cure is fundamentally the quantitative one of providing more of the diet that people have been historically accustomed to eating,

which in turn has led to a positive reevaluation of traditional diets (Behar, 1976 b), and in parallel to criticisms of the thermodynamic efficiency of animals as nutritional energy converters. The pig, the most efficient converter today, gains a pound of weight (including nonedible parts) for each 3 to 3.5 pounds of food it eats (Pond, 1983), compared with direct absorption of energy by humans from grain, which approaches ninety percent.

In energy terms, the results of choosing either alternative are momentarily different. The U. S. diet has increased its annual consumption of animal protein-rich foods from 55 pounds of meat and 18 of chicken in 1940 to 117 of meat and 51 of chicken in 1972 (Manocha, 1974). Inputs for this choice, however, mean that a "net" U.S. diet of 3000 kcal. daily requires a daily input of 33900 kcal. in diets where meats predominate, of 18900 kcal. daily in diets whose animal protein component is provided by milk and dairy products, and of 9900 kcal. daily in a vegetarian diet (Pimentel and Pimentel, 1979). Even this last diet has a protein input which surpasses the most recent FAO/WHO Recommendations. "Two thirds of the world's population consume primarily a vegetarian-type diet. In these areas, about 184 kg. of grain are consumed annually per person, and little animal food is eaten. In contrast, the remaining third of the world, including people who live in industrial countries like the U.S., consume about 115 kg. of animal products per person annum. In order to produce this quantity of food of animal origin, about 605 kg. of grain are cultivated per person annum, which are given to animals as fodder" (U.S. Department of Agriculture, 1976). Later figures in this respect state that every U.S. citizen consumes annually 1130 kg. of grain, 116 consumed directly and 1184 given to animals as fodder (Pimentel and Pimentel, 1979).

This wastefulness makes no sense in health terms, the Cuban mortality statistics reviewed above have shown a country whose mortality level is almost as low as the U.S. one; Chinese mortality has decreased precipitously, again to quasi U.S. level; and both countries rely apparently on what are largely vegetarian diets.

Few examples of the contrast between two logics can be so dramatic. A barbecue of nightingales' tongues is always a possibility for the logic of Capitalist accumulation, the replacement of maternal lactation by artificial milks is a horrifying current one. Against these, the logic of the biosphere would provide pathways (their efficiency eventually measured in terms of energy consumption and production) (Leach, 1976) (Pimentel and Pimentel, 1979) for a rational and humane feeding of that hegemonic newcomer to the biosphere, "Homo sapiens ".

V) NOTES

NOTE 1 Four periods have been analysed in Marx and Engels' characterisations of the center-periphery dialectic of Capitalism, and, more specifically, of imperialism. From 1847 to 1856, there was a "moral repudiation and a theoretical justification" exemplified by Marx's description of the destruction of home-grown Indian manufactures by British Capitalism as "revolutionary" (i.e. enabling a Capitalist development which would eventually be replaced by Communism); and of the civilising role Capitalism over " barbarian " pre-Capitalist countries. From that period are dated Marx's articles justifying the U.S. invasion of Mexico (1847) and his savage criticism of the Venezuelan liberator, Simon Bolivar. From 1856 to 1864 the Marxian denunciations of Capitalist and Imperialist highhandedness increase significantly. From 1864 to 1883 has been described as "prefiguring the notion of underdevelopment", although at the same time an explicit denial is made of the right of "residues of peoples" (Serbs, Czechs, Roumanians) to an autonomous

national existence, which is granted to "viable" nationalities. From 1883 (by Engels alone) a gradual disinterest to extra-European affairs becomes apparent, and a defense is made of national defensive wars in Europe (by Germany against Russia). (Scaron, 1972). For another recent criticism of Marx's views on the Capitalist periphery, see Palerm, 1980.

NOTE 2 For a useful synthesis, see Anderson, 1976. The 100 th. anniversary of Marx's death has produced a torrent of evaluations of the impact of Marxist thought. As one example, see Hobsbawm, 1983.

NOTE 3 The name most usually associated with "dependentismo" is Andre Gunder Frank; others being Dos Santos, Cardoso, Faletto, Quijano, Marini, etc. For criticisms of "dependentismo", see Laclau, 1978; Castañeda and Hett, 1978 and Wolf, 1982. For "dependentista" responses to " antidependentista" critiques, see Bambilra, 1978 and Frank, 1977.

NOTE 4 Pailloix, Samir Amin, Arrighi, Emmanuel.

NOTE 5 For critiques of Wallerstein, see Laclau, 1978 and Wolf, 1982.

NOTE 6 Cecil Rhodes put this neatly "In order to save the 40 million inhabitants of the United Kingdom from a bloody civil war, our Colonial statesmen must acquire new lands for settling the surplus population of this country, to provide new markets for the goods produced in the factories and mines". Quoted in Morris, 1979. A literary impression on being on the receiving end of the flow of wealth is given by Gerald Brenan "In May 1930 I arrived in London. When visiting my lawyers, I found that my income was of 350 pounds per year, from about thirty industrial enterprise scattered throughout the world, from China to Peru, in the shape of mines, railways, trams, and gas factories; and it amazed me to think that in so many different places of the surface of the earth, there was collaboration to provide me with a solid wellbeing" (Brenan, 1976).

NOTE 7 This is extensively discussed by Dewey, 1984. The evidence that she gathers, from empirical studies by Ferroni in Peru, by Marchione in Jamaica and by herself in Mexico, plus her theoretical discussion, stress the fact that food autarky is largely associated with good nutrition, and that Capitalist relations of production (although not so called by her) with regard to food in a peasant Latin American environment

would point to a deterioration in the level of nutrition.

NOTE 8

The picture presented by different "real socialist" countries in terms of nutrition and use of resources of the biosphere is somewhat mixed. The USSR is importing large quantities of fodder in order to increase its livestock and hyperproteinize its diet (Ellman, 1982, 1983). In that country, increases in mortality, especially infant mortality, have been reported (Eberstadt, 1981). The situations in China and Cuba have already been reviewed. Vietnam reports significant decreases in mortality: an infant mortality of 34 per thousand in 1980 (Nguyen Dui Cuong, 1981), all the more noteworthy after the destruction and long-term ecological damage (from the use of herbicides) caused by the U.S. intervention. Agricultural policies seem to be different now in China from those of some years ago (Watson, 1983)(Selden, 1983) (Mirsky, 1983) and are in turn different from those in the Soviet Union (Maurel, 1982) or in Hungary (Buchan, 1984). The thought creeps in that "real socialism" is more nationalistic and shows a more heterogeneous behavior than peripheral Capitalism, whose policies are dictated at the center, and whose margins for manoeuver are far smaller.

NOTE 9

For recent Latin American views of the artificial lactation debate, see Arana, 1982 and Ysunza Ogazón, 1983.

NOTE 10

Sri Lanka has an extensive network of distribution of subsidized rice, which costs no more than 5% of its GNP. Its life expectancy is 66 years, against 52 years in India and 50 in Pakistan. The Indian State of Kerala, which has well developed health and social services networks has India's lowest mortality, in spite of its low economic indicators. In Mexico, a country where mortality has decreased very fast in the last decades (by peripheral Capitalist standards), the CONASUPO/COPLAMAR system distributes nationally subsidized foodstuffs. From a planetary perspective the eradication of malnutrition worldwide is quite cheap: it would only require 16% of the current wheat production, 5% of the current grain production, 12% of the grain that is currently given to animals as fodder (Escudero, 1983).

(+) (Sen, 1982)

VI) REFERENCES

- Anderson, Perry (1976) Considerations on Western Marxism
New Left Books, London
- Arana, Marcos (1982) "Las fórmulas infantiles para la alimentación infantil" Revista Latinoamericana de Salud Nr. 2, Mexico.
- Bambirra, Vania (1978) Teoría de la dependencia: una anticrítica Serie Popular Era, Mexico.
- Barkin, David and Suarez, Blanca (1982) El fin de la auto-suficiencia alimentaria Nueva Imagen, Mexico.
- Behar, Moises (1976a) " Nutrition and the future of mankind" World Health Organization Chronicle 30, 140-143.
- Behar, Moises (1976 b) "European diets and traditional foods" Food Policy , November.
- Bermann, Sylvia and Escudero, José Carlos (1978) "Health in Argentina under the military Junta" International Journal of Health Services Vol.8 , Nr. 3.
- Bernstein, Thomas S. (1983) "Starving to death in China" The New York Review of Books Vol.XXX , Nr. 10, June 16.
- Bessis, Sophie (1981) L'arme alimentaire Petite Collection Maspero, Nr. 248 . Paris.
- Bosch, Juan (1981) De Cristóbal Colón a Fidel Castre : el Caribe, frontera imperial , Casa de las Américas, La Habana.
- Braudel, Fernand (1974) Capitalism and material life 1400-1800 Fontana Collins, London.
- Buchan, David (1984) "Hungary: trade and industry" The Financial Times May 10 issue.
- Brenan, Gerald (1976) Memoria personal 1920-1975 Alianza, Madrid.
- Castañeda, J. and Hett, E. (1978) El economismo dependiente Siglo XXI , Mexico-
- Cipolla, Carlo (1978) The economic history of world population Seventh Edition. Pelican, Harmondsworth.

- Clark, Colin (1968) Crecimiento demográfico y utilización del suelo Alianza, Madrid.
- Condamines, Charles (1982) "Las tierras del tercer mundo para alimentar a los países industrializados" Le Monde Diplomatique en español Nr. 47, November, Mexico.
- Craviotto, Joaquín (1974) " Informe sobre una visita de estudio a la República Popular China" Salud Pública de Mexico Vol.XVI, Nr. 4, July-August.
- Davis, Ralph (1977) La Europa Atlántica: desde los descubrimientos hasta la industrialización , SigloXXI, Mexico
- Dewey, Kathryn G. "Nutrition and the commodization of food systems in Latin America" To be presented at the conference on "Political Economy of health and disease in Africa and LatinAmerica" , Mexico, 1985.
- Dui Cuong Nguyen (1981) "le service de santé Vietnamienne dans la lutte de liberation nationale " Lecture et Maestría de Medicina Social, Universidad Autónoma Metropolitana, Xochimilco, Mexico.
- Eberstadt, Nick (1981) "Notas bibliográficas sobre el aumento de la mortalidad infantil en la URSS " Ciencia y desarrollo Nr. 38 , May-June, Mexico.
- Echeverría Zuno, Rodolfo (1982) Las transnacionales de la agricultura y la alimentación Nueva Imagen, Mexico.
- Ellman, Michael(1982) "Soviet grain imports and the weather" in Rolando García Nature pleads not guilty Pergamon, London.
- Ellman, Michael (1983) La planificación socialista Fondo de Cultura Económica, Mexico.
- Escudero, José Carlos (1974) "La situación sanitaria nacional" Cuadernos de Contramedicina Nr. 1, Policiencia ediciones, Buenos Aires.
- Escudero, José Carlos (1975) " Mortalidad por desnutrición: un estudio de causas múltiples de muerte" Cuadernos de Salud Pública Nr. 10, Buenos Aires.
- Escudero, José Carlos (1978a) "Un estudio de caso de política nutricional " Salud Problema Nr, 2 , Mexico, April.

- Escudero, José Carlos (1978b) "The magnitude of malnutrition in Latin America" International Journal of Health Services Vol. 8, Nr. 3.
- Escudero, José Carlos (1980) " On lies and health statistics : some Latin American examples" International Journal of Health Services Vol. 10, Nr. 3.
- Escudero, José Carlos (1981a) "Ambas orillas del Canal del Viento" Territorios Nr. 11, Mexico.
- Escudero, José Carlos (1981b) "Democracy, authoritarianism and health in Argentina" International Journal of Health Services Vol. 11, Nr. 4.
- Escudero, José Carlos (1983) "Daños sociales por desnutrición" Cuadernos médico sociales Nr. 25, Rosario, Argentina, September.
- Escudero, José Carlos (1984 a) " Las muertes por desnutrición en Mexico " Foro Universitario Nr. 40, Mexico, March.
- Escudero, José Carlos (1984 b) "¿ Puede erradicarse la desnutrición? " Cuadernos de Marcha Nr. 26 , Mexico, April .
Reprinted in Salud y Sociedad Nr. 5, 1984, Córdoba , Argentina, April.
- Escudero, José Carlos (forthcoming) " Climatic impact on human life and health" in Robert Kates (editor) The sciences of climatic impact assessment John Wiley, New York.
- Frank, Andre Gunder (1977) "Dependency is dead, long live dependency and the class struggle " World development Vol. 5, Nr. 4 , April.
- García, Rolando and Escudero, José Carlos (1982) The constant catastrophe Pergamon, London.
- George, Susan (1977) How the other half dies Allanheld Osmun, Montclair, New Jersey.
- Gorz, André (1980) Ecology as politics South End Press, Boston.
- Hilferding, Rudolf (1910) Finance Capital

- Hobsbawm, Eric (1969) Industry and Empire Pelican, Harmondsworth.
- Hobsbawm, Eric (1977) The age of Capital 1848-1875 Abacus, London.
- Hobsbawm, Eric (1983) "El marxismo hoy " Cuadernos políticos Nr, 36, Mexico, April-June.
- Hobson, John (1902) Imperialism, a study
- Holt, S.J. (1969) "The food resources of the ocean " Scientific American Vol. 221, Nr. 3 , September.
- Keyfitz, Nathan (1984) "The population of China" Scientific American Vol.250, Nr. 2, February.
- Kotliar, Hector and Escudero, José Carlos (1973) "Desnutrición en la Argentina" Ciencia Nueva Nr. 31, Buenos Aires, November.
- Laclau, Ernesto (1978) Política e ideología en la teoría marxista Siglo XXI, Mexico.
- Leach, G. (1976) Energy and food production IPC Science and Technology Press, Guildford, Surrey.
- Lenin, Vladimir (1917) Imperialism: the highest stage of Capitalism .
- Levins, Richard (1969) "Genetics and hunger " Genetics 78; 67-76 , September.
- Luxemburg, Rosa (1913) The accumulation of capital
- Mc. Neill, William (1976) Plagues and Peoples Doubleday Anchor, New York.
- Magdoff, Harry (1974) Article on "Colonialism" The Encyclopaedia Britannica, Macropoedia 15 th. Edition.
- Mandel, Ernest (1978) Late Capitalism Verso Press, London ,
- Manocha, Sohan (1974) Nutrition and our overpopulated planet Charles C. Thomas, Springfield, Illinois.

- Maurel, Marie Claude (1982) " Le modèle agricole soviétique: aurait-il fait faillite? " in Tricontinental (1982).
- Mayer, Jean (1976) "The dimensions of human hunger " Scientific American Vol.235, Nr.3, September.
- Mirsky, Jonathan (1984)"Revolution's end" The New Statesman July 13.
- Moore Lappe, Frances and Collins, Joseph (1977) Food first: beyond the myth of scarcity Houghton Mifflin, Boston.
- Moreno Fragnals, Manuel (1977) Africa en America Latina Siglo XXI, Mexico.
- Morris, James (1979) Pax Britannica Penguin Books, Harmondsworth.
- Munro, H. N. (1975) " How well recommended are the recommended dietary allowances ? " Journal of the American Dietetic Association Vol. 66, January.
- Nobel, Park S. (1974) "The currency of life " in Nigel Calder, editor, Nature in the round The Viking Press, New York.
- Palerm, Angel (1980) " Un modelo marxista para la formación colonial en Mexico " in Palerm, Antropología y marxismo . Nueva Imagen, Mexico.
- Pimentel, David and Pimentel, Marcia (1979) Food, energy and society Edward Arnold, London.
- Pond, Wilson G. (1983) "Modern pork production " Scientific American Vol, 248 , Nr. 5, May.
- Puffer, Ruth R. and Serrano, Carlos (1973) Patterns of mortality in childhood Scientific Publication Nr. 262. Pan American Health Organization. Washington D.C.
- Rappaport, Roy (1975) "El flujo de energía en una sociedad agrícola " , in Scientific American: la energía Alianza, Madrid.
- Robbins, William (1974) The American food scandal William Morrow, New York.

- Rodney, Walter (1982) De como Europa subdesarrolló a Africa Siglo XXI, Mexico.
- Sabelli, Martín (1981) (pseudonym of José Carlos Escudero) " Epidemiología de la desnutrición " Cuadernos Médico Sociales Nr. 15, Rosario, Argentina.
- Sabulsky, Jacobo (1983) "Desnutrición: su perfil biológico y social " Salud y sociedad Nr. 2, Cordoba, Argentina,
- Scaron, Peero (1972) Karl Marx, Friedrich Engels : materiales para la historia de America Latina Cuadernos de Pasado y Presente Nr. 30, 5th. edition. Ediciones de Pasado y Presente, Mexico.
- Selden, Mark (1983) "The logic and limits of Chinese socialist development" World development Vol. 11, Nr.8.
- Semo, Enrique (1973) Historia del capitalismo en Mexico: los orígenes 1521-1723 Ediciones Era, Mexico.
- Sen, Amartya (1982) "How is India doing ?" The New York Review of Books, Vol. XXIX, Nr. 20 , December 16.
- Shorter, Edward (1981) "l'age des premières règles en France , 1750-1950" Annales: Economies, Sociétés, Civilisations , 36th. year, May-June.
- Stavis, Ben (1982a) "Ending famines in China" Annex 2 of ch. 9 of García and Escudero , 1982.
- Stavis, Ben (1982b) "The distribution of food in present day China" Annex 2 of ch. 16 of García and Escudero , 1982.
- Stavis, Ben (1983) Letter to the Editor The New York Review of Books Vol. XXX, Nr. 3, March 3.
- Stephen, C.J. (1981) U.S. Government position on the marketing of breast milk substitutes American Public Health Association, Washington D.C.

- Steinhart J.B. and Steinhart C.E. (1974) "Energy use in the U.S. Science , April 5. Agriculture"
- Tissier, Patrick (1982) "Le modèle chinois de lutte contre la faim" . In Tricontinental , 1982.
- Tricontinental (1982) Famines et pénuries : la faim dans le monde et les idées reçues Petite Collection Maspéro Nr. 273, Paris.
- Tudge, Colin (1977) The famine business Pelican, Harmondsworth.
- United States Department of Agriculture (1976) Agricultural Statistics, 1976 U.S. Govt. Printing Office, Washington D.C.
- Wallerstein, Immanuel (1979) El moderno sistema mundial: la agricultura capitalista y los orígenes de la economía-mundo europea en el siglo XVI Siglo XXI, Mexico,
- Wallerstein, Immanuel (1980) Mercantilism and the consolidation of the European World Economy Academic Press, New York.
- Wallerstein, Immanuel (1983 a) Contribution in S. Amin, G. Arrighi, A. G. Frank and I. Wallerstein Dinámica de la crisis global Siglo XXI, Mexico.
- Wallerstein, Immanuel (1983 b) Historical Capitalism Verso Editions, London.
- Warman, Arturo (1983) Lecture at the Instituto Nacional de la Nutrición, Mexico.
- Watson, Andrew (1983) "Agriculture looks for shoes that fit " World development Vol. 11, Nr. 8, August.
- Wechtel, Nathan (1983) Review of Noble Cook Demographic collapse: Indian Peru 1520-1620 . Cambridge University Press, 1981. This review appeared in Annales: Economies, Sociétés, Civilisations , year 38, May-June.
- Wolf, Eric (1982) Europe and the people without history University of California Press.
- Ysanza Ogasón, Alberto (1983) Consideraciones biosociales de la lactancia materna , Publication L-55, Instituto Nacional de la