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QUESNAY AND LEONTIEF ON CAPITAL AND INCOME

ABSTRACT

I analyze Quesnay's explanation of the "*Tableau Economique*" of 1766 in order to show that he made a clear distinction between capital and income. In holding this distinction, Quesnay rejected the nowadays currently accepted views that the full value of the national output is equal to aggregate income and that the value of national output is equal to the payments to labor, capital and land. I analyze the foundation upon which Quesnay established the distinction and show that it is sound. In so doing, I also discuss the validity of Phillips' standard interpretation of the "*Tableau*" in terms of input-output tables. I show that this interpretation distorts Quesnay so seriously that it attributes to him the rejection of the distinction of capital and income. On the theoretical basis provided by the analysis of Quesnay's distinction, I contend that Leontief's input-output tables do not show that the aggegate value of output is equal to aggregate income, but the contrary, that is, that Quesnay's distinction was right.

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Introduction

Whatever the defects of his theory might be, Dr. Quesnay's "*Tableau Economique*" and, above all, his explanations of it, are rightly regarded today as a fundamental contribution to the formation of scientific economics. Quesnay can be said to be the first economist in the history of scientific economics who attempted to produce a systematic vision of an economic system the end of which was the production of surplus value, or, to use his expression, of "*produit net*". The "*produit net*" was the income generated by the turnover of capital, by the cyclical movement of the "*avances*", which is the value the use of which is to generate a greater value. Quesnay was the first who attempted to define the notions of "capital" ("*avances*") and "income" ("*revenu*") in terms of the theory of value. His merit is that he attempted to establishing the connection, despite the fact that his theory of value based on land was defective.

It is a pity that Quesnay's insights into the concepts of capital and income are greatly obscured by his appeal to land as the foundation of value in exchange. This has prevented many economists from grasping the essentials of Quesnay's vision of a system the end of which is the production of surplus value. If *value* consists of land, then *surplus value* must consist of *surplus* land. We may put this otherwise: if value consists of *matter*, then surplus value must consist of *surplus matter*. Thence the idea that there is surplus value only where nature "multiplies" matter. Since manufacture "transforms" matter without altering its quantity, that is, without "multiplying" it, it follows that only agriculture is productive of surplus value, of "*produit net*". This leads to the idea that the rent of land represents the value of the part of the output of the economy which represents the surplus value, or "*produit net*" or income. This also leads to the idea that the profits of capital do not represent a surplus value, but a cost of production or capital which can ultimately be thought of as wages.

In spite of these misleading implications of his theory of value based on land or matter, Quesnay put the production of "*produit net*" at the very heart of his system, and thus pointed for the first time in history to the constitutive feature of modern capitalist economies. Understanding the workings of such an economic system

demands to place as a first premise the distinction between capital and income, or, as Quesnay said, of "*avances*" (capital) and "*revenu*" or "*produit net*" (income).

Quesnay's fundamental distinction was rejected by Smith in his "*Wealth of Nations*" in some crucial passages, such as those dealing with the theory of price in book I. At other places, however, such as book II, Smith tried to keep to Quesnay's distinction, but he did it in a obscure way plagued by inconsistent statements owing to the mistakes he he had previously made in book I. I deal with Smith's failure in a separate paper. The final outcome was that the mistaken theory of price of book I, which, however, was stated in clear terms, sent to oblivion the abstruse chapter 2 of book II and, together with it, Quesnay's distinction of capital and income. The heirs of Smith learned from the master that the full value of commodities becomes income, either as profits, wages or rent. Nobody seems to have noted that such a statement implies that nothing of the value of commodities is capital, that is, that aggregate capital is zero.

In this paper, I want to go back to Quesnay, who, I contend, held the right opinion on the subject of capital and income. It is interesting to study Quesnay's project and to compare it to Smith and to what modern textbooks teach as accepted wisdom. As a heir of Smith, contemporary Macroeconomics rejects the distinction between capital and income. It holds that, ultimately, capital becomes income. Virtually every textbook on Macroeconomics teaches that the full value of national output is equal to national income; note well: *not* to national *income* plus national *capital*, but to national income *only*. The reason is that, ultimately, capital becomes income. Thus, contemporary Macroeconomics comes to the shocking contention that, in a capitalistic economy, national capital is zero, because the full national capital becomes, ultimately, income. Thence the thesis that the value of national output is equal to national income, or to aggregate value added. This carries the senseless implication, never faced by textbook literature, that there cannot be any national capital; once value added has been discounted from the full value of national output, there remains nothing, which means that value added was added to no value, that is, to no capital.

In this paper, I want to show that the thesis currently taught by textbooks is false: it is natural that it appears to be shocking when we look at it calmly. By going

back to Quesnay, we can rectify a fundamental error that plagues a good deal of today's Macroeconomics.

One may reply: it is true that virtually every textbook on Macroeconomics starts by explaining to the student that the full value of national output is equal to national income. It is also true that this proposition implies logically that national capital is zero. But you cannot ignore the fact that every textbook speaks of "national capital" and lays down the distinction between "gross national product" and "net national product", which amounts to acknowledging that there is such a thing as national capital. No textbook on Macroeconomics has ever denied that there is such a thing as "national capital".

To this I answer that all the textbooks that contend that the value of national output is equal to national income deny, by logical implication, that there is such a thing as "national capital". Their acknowledgement of national capital is purely nominal and lacks theoretical foundation. Textbooks on Macreoconomics are inconsistent in holding that the full value of national product becomes income and, at the same time, that there are things such as "national capital" or a distinction between "gross" and "net" output. If there is "national capital", then the value of output cannot be equal to national income only. If the distinction between "gross" and "net" income" is to make any sense, then the value of national output cannot be equal to national income. Otherwise, there would be no room for "national capital".

Contemporary Macroeconomics agrees with the most famous critic of the Physiocrats, Say, in rejecting the Physiocratic distinction between capital and income. Say rejected the Physiocratic notion of a "*produit net*" as a "phantasy" and, logically with it, the distinction between capital and income. The only product of a nation, said Say, is the "*produit brut*". In so saying, Say gave a meaning to the term "*produit brut*" which was opposed to that given to it by the economist who coined it, namely, Dr. Quesnay. According to Quesnay, the "*produit brut*" was the value of national output, and had two parts: national capital and national income. According to Say, "*produit brut*" is not national capital plus national income, but national capital only.

Note, then, that Say's rejection of the Physiocratic distinction of capital and income also contradicts today's common view, just presented, that the value of national output is equal to national income. Say's thesis that the value of the national output is

the "*produit brut*" means that the full value of the national output is equal to national *capital*, not to national *income*, contrary to what contemporary Macroeconomics textbooks teach. Instead of holding that the full value of the national output is equal to national income, Say holds that it is equal to national capital. National income must be identical to zero, which is why Say says that the Physiocratic notion of a "*produit net*" is a "phantasy".

Say came to this conclusion on the ground that the value of commodities is equal to their cost of production. This means that, according to Say, and contrary to Quesnay, the full value of aggregate output cannot fail to be equal to its aggregate cost of production. The cost of production of a commodity was defined by Say as the payments to the factors of production, that is, as the sum of the wages of labor, the profits of capital and the rent of land. These three payments represent the value of the productive services contributed by the factors to the value of output: they represent what is to be paid to the factors in order to produce the commodity. It is easy to see that the payments to the productive factors are the capital investments required to produce the commodity. Thence Say's idea that the value of commodities must be equal to the value of the capital invested on their production. And nothing more. Therefore, the value of national output must be equal to the value of the national capital.

Since the value of commodities cannot fail to be equal to their cost of production, it obviously follows that the value of commodities cannot be greater than their cost of production. Quesnay's "*produit net*" was but this excess, the existence of which is denied by Say. The notion of a "*produit net*" is a phantasy, says Say, or, in other words, a logical blunder. Say thus comes to a conclusion no less shocking than that which we are taught in today's Macroeconomics textbooks, namely, that, in a capitalistic economy, the income of capital cannot be other than zero.

One might reply again, saying: the view that the value of commodities is determined by cost of production is not Say's only; in fact, it can be easily found in any modern textbook on Macroeconomics. Strange as it may seem, modern textbooks and Say, who defend contrary views as to the relation between the value of national output and income and capital, share the same theory of value. There seems to be a fallacy somewhere here. If two authors start from the same theory of value, how is it possible

that they reach contrary views as to the relationship between output, income and capital?

To this I answer: because modern textbooks incur in a second logical contradiction here. The acceptance of the thesis that the value of commodities is equal to the payments to the factors should have lead modern textbooks to the conclusion that the value of commodities was logically identical with the value of the capital invested on their production; national income, by definition, would be zero, as Say correctly inferred from his theory of value. But modern textbooks refuse to state what logic demands them to state. Instead, they reason as follows: since factors of production are paid for their productive services, there is a flow of money to the factors of production. That there is a flow of money to the factors amounts to saying that the factors receive income. Therefore, the factors of production have an income, and the value of commodities is equal to the income of the productive factors.

As it seems, it never occurred to modern textbooks that the flow of *money* to the productive factors was not a flow of *income*, but a flow of *capital*. They start from the hidden premise that "flow of money" is the same as "flow of income". But it certainly occurred to Say, which is why he concluded that the value of national output was equal to national capital. On the baseless premise that every flow of money represents a flow of income, modern textbooks conclude that the full value of output is equal to national income. They should have concluded, rather, that the value of national output is equal to the full flow of *money* in the economy, which need not be a flow of income, and, in fact, it is not.

My contention is that both Say and modern textbooks are wrong. Quesnay was right: in a capitalistic economy, that is, in an economy in which the goal is the accumulation of capital, or, as Quesnay would have said, the production of surplus value or "*produit net*", there is a distinction between capital and income. Not every flow of money is a flow of income, nor of capital only. This means that there is a distinction between "gross" and "net" national output.

Quesnay's ideas are graphically depicted in his famous "*Tableau Economique*". It is interesting to examine how the "*Tableau*" has been interpreted nowadays as embodying the same view on capital and income as that which is common in modern Macroeconomics textbooks. Moreover, the "*Tableau*" is said to have had

offspring in the shape of Leontief's input-output tables, which, supposedly, show that the value of national output is equal to national income. To worsen the confusion, the interpretation of the input-output tables suggests that the mistaken view that the value of output is equal to income is an alternative statement of the principle of double entry book-keeping. This carries the implication that, if the identification of the value of output with income is rejected (as Quesnay did), then the validity of the principle of double entry book-keeping is also rejected.

In this paper, I will deal only with Quesnay's distinction between capital and income and with the mistaken interpretation of Quesnay that is presented in modern textbooks on the History of Economic Thought. I will deal with Leontief and double entry book-keeping in another paper. I have chosen Blaug's "*Economic Theory In Retrospect*" as the representative of the standard interpretation, not because he is original, but because he is clear and systematic.

The paper is divided into four sections. First, I analyze Quesnay's explanation of the "*Tableau Economique*", and show that he held that capital does not become income nor income capital. I make clear the meaning of the basic terms "*avances*" and "*produit net*" directly from Quesnay's texts. Secondly, I devote a separate section to rectify the numerical calculations that appear in Quesnay's famous "*Tableau*" of 1766. The purpose of this section is to clear the way for theoretical discussion, that is, that this discussion is not hampered by accidental miscalculations. Thirdly, I take up the standard modern interpretation of Quesnay's "*Tableau*" of 1766 as it appears in Blaug. I show how this standard interpretation contradicts the fundamental principles laid down by Quesnay. In the forth section, I make some final remarks on the question as to whether the rent of land is a payment for "rental services". The final section is devoted to conclusions.

1. Quesnay's Distinction Between Capital and Income

There are two distinctions which define the basic structure of Quesnay's view of a modern economy:

1) That between "*produit brut*" and "*produit net*".

2) That between "*avances*" and "*revenue*".

These two distinctions are closely related; in fact, they are the two sides of the same coin. What Quesnay names "*avances*" is what we would call today "capital"; what he calls "*revenue*" is what we would call "income". The "*produit brut*" is the return of the capital invested (the return of what was advanced) together with a profit: the profit itself, as distinguished from the capital that gave rise to it, is the "*produit net*". Accordingly, "*revenue*" and "*produit net*" are, in Quesnay, two names for the same thing, which, in today's usage, we may call "profit and rent of land". More in accordance with the spirit of the Physiocratic theory, we may also call it "surplus value" or "added value". This surplus or added value is what Quesnay understands as income.

Accordingly, the nature of income in the theory of Quesnay is to be surplus value. Income is not only value, but surplus value; without surplus there is no income, even though there is value. Income is the value over and above another value, which is capital. The fact that Quesnay identifies income with the rent of land, is, as I will try to show, an accesory feature of his theory which should not prevent us from grasping its nuclear message. The core contention of Quesnay is that income is of the nature of surplus value. According to this view, the exchange of a commodity for money does not give rise to an income for the seller of the commodity if the value obtained and the value given out are the same. By exchanging a commodity other than money for its equivalent in money, the seller does not have an *income*, but *liquidity*. If the seller is to obtain an income from the exchange transaction he must get a value greater than that which he invested, which is the value that he gives out.

Then, there naturally arises the question: Who makes up for the excess? This is the question; a distinctive feature of Quesnay' theory is the answer that it provides to this question. According to Quesnay, the surplus value is not paid for by the buyer, as the Mercantilists contended, but by nature. Surplus value is, according to Quesnay, a free gift of nature to mankind. Thus, the gain of the seller does not involve any loss for the buyer, because the buyer does not have to pay for the benefit of the seller: nature does it for nothing, by multiplying matter.

This idea provides the ground for the "*Tablau Economique*". In the "*Tableau*", there is surplus value, repesented by the rent of land, not because the output of the economy is sold at price greater than its value. All the exchanges depicted in the

"*Tableau*" are exchanges of equivalent values. This implies that the national output is sold at its value. Then, how is it possible that its sale leaves a surplus value? Because surplus value was already included within the value of output. The sale of national ptuput does not create any surplus value, but gives a *liquid* form to this surplus value, an expression in money. The money that the farmers pay to the landowners as rent does not cancel any debt created by an exchange contract, because the landowners give nothing to the farmers. The rent of land makes up for no production cost. The money paid as rent of land represents aggregate surplus value, the matter that nature grants to mankind for nothing by multiplying matter.

According to Quesnay, society is to be divided into three classes for the purposes of economic analysis. Contrary to Quesnay's "*Tableau*", the unit in Leontief's tables are the industries. Leontief's tables tell us the relations existing among industries. Quesnay's table does not do so: his actors are not firms or industries, but social classes. The "*Tableau*" tells us the relations existing among the classes of society in relation to the production and distribution of surplus value, not among the industries of society, or, to be more accurate, the relations among industries as dictated by the production of surplus value. Social classes are defined in relation to surplus value: the surplus value producing class is the "*classe producif*"; the class that does not produce surplus value is the "*classe sterile*". There is a third class which, though it does not produce surplus value, is the owner of it, and, accordingly, gets the whole of it from the surplus value producing class. This third class is the "*classe mixte*" or "*des propietaires*".

Quesnay begins his analysis of the "*Tableau*" as follows:

"Le nation est réduite à tres classes the citoyens: la *classe productive*, la *classe des propiétaires*, et la *clase stérile*.

La *classe productive* est celle qui fait renaître par la culture du territoire les richesses annuelles de la Nation, qui fait les avances des dépenses des travaux de l'agriculture, et qui paye annuellement les revenus des propriétaires des terres. On renferme dans la dépendance de cette classe tous les travaux et toutes les dépenses qui s'y font jusqu'à la vente des productions à la premiere main: c'est par cette vente qu'on connoît la valeur de la réproduction annuelle des richesses de la nation." (Quesnay, in Daire, 1846, 58)

To say that the productive class makes "the advance of the expenses involved in the agricultural works" amounts to saying that the productive class is the class of people which undertakes all the investments of capital in the economy: therefore, the productive class is the class of those people who own capital and invest it. Out of its proceeds, this class pays for the revenues of the landowners in addition to recouping its capital together with the corresponding profit, which Quesnay regarded as a kind of wages of labor.

"La *classe des propriétaires* comprend le souverain, les possesseurs des terres et les décimateurs. Cette classe subsiste par le revenu ou *produit net* de la culture, qui lui est payé annuellement par la classe productive, après que celle-ci a prélevé, sur la reproduction qu'elle fait renaître annuellement, les richesses nécessaires pour se rembourser de ses avances annuelles et pour entretenir ses richesses d'exploitation." (Quesnay, in Daire, 1846, 58)

Note how in this text Quesnay explicitly equates "*revenu*" with "*produit net*". The class of landowners is maintained by the investments of the productive class, or better, out of the returns to these investments. The class of landowners gets the whole of the "*produit net*", that is, the whole income that would otherwise accrue to the productive class, or better, that accrues to it in the first instance, but which must be transferred as rent of land to the class of landowners. In other words: the money that the landowners obtain on the basis of their property right over land (and, hence, over the productions of land) is actually the full income yielded by the investments undertaken by the productive class. As I will presently show, the structure of property is such that the property right over land allows the landowners to appropiate the full income, net product or revenue of the economy.

"La *classe stérile* est formée de tous les citoyens occupés à d'autres services et à d'autres travaux que ceux de l'agriculture; et dont les dépenses sont payées par la classe productive et par la classe des propriétaires, qui eux-mêmes tirent leurs revenus de la classe productive." (Quesnay, in Daire, 1846, 58)

The steriles, just like the landowners, are maintained by the productives, but in a very different way. The steriles do not have any property right over the surplus yielded by capital. This means that the money that they get as a result of the sale of

their products is not a true income, because it is not any part of aggregate surplus value. If it is not income, then it must be capital, and this is what Quesnay means when he says that the sterile class has "*avances*", and that these "*avances*" provide the subsistence of the sterile class. This means that the maintenance of the sterile class is a production cost for the economy as a whole, that is, for the capital of the economy, the goal of which is the production of surplus value or "*produit net*". The lower the investment on labor and goods produced by the sterile class, for a given value of output or "*produit brut*", the greater surplus value, income and net product.

"Le Tableau économique renferme les trois classes et leurs richesses annuelles, et décrit leur commerce dans la forme que suit.

Classe productive: AVANCES *annuelles* de la classe productive, montantes à *deux milliards*, qui ont produit *cinq milliards*, dont *deux milliards* sont un *produit net* ou *revenu*." (Quesnay, in Daire, 1846, 58)

"*Avances*" refers to the money that is invested. This money is advanced in the sense that it is given out before the sale of the commodities other than money. This means that the money advanced is the capital which is to be recouped when the value that is the property of the productive class is given a liquid shape through exchange. Thus, the term "*avance*" is strictly synonymous with "capital".

The "*avances annuelles*" are not the only kind of capital. In addition to it, we have the "avances primitives", also referred to as "expenses of establishment". The difference between the two types of capital is not substantial, but only accidental. The criterion of distinction is liquidity, or, what amounts to the same, the turnover period. The part of the capital investment that returns in a short time to having the shape of money is labelled as "*avance annuelle*", that is, circulating capital, whereas the part of the capital investment that is transformed back into money within a longer time period is labelled as "*avance primitif*", that is, fixed capital.

Quesnay's statement in the text just quoted is misleading and inaccurate. It should be understood as saying that an investment of two milliards in circulating capital gives rise to a a product the value of which is 5 milliards. The value of the "*produit net*" is said to be of 2 miliards. The reader might object that the accounts do not square: if we deduct the amortization of the investment on circulating capital, 2 milliards, from

the "*produit brut*", 5 milliards, what we get is a "*produit net*" of 3 milliards, not of 2, as Quesnay writes. The explanation of this incoherence is that the investment of 2 milliards on circulating capital is not the whole of the actual capital investment: there was another investment of 10 milliards the turnover of which is 10 years, the "*avances primitives*" or fixed capital. Therefore, the capital that has actually turned over this year is the full circulating capital plus one tenth of the fixed capital of 10 milliards: 2 milliards + 1 milliard= 3 milliards. This is the amount that is to be deducted from the "*produit brut*" this year as amortization of capital, or, what is the same, as production cost. Now, we see that Quesnay was coherent when saying that the value of the "*produit net*" was 2 milliards.

One may say that, since the productive class is maintained by avances, just like the sterile class and unlike the class of landowners, then the productive class is actually on the same footing as the sterile class: they are a production cost for capital, and its maintenance is a production cost. However, this is not a correct reading, in my opinion. There is a fundamental difference between the sterile and the productive class, namely, that the sterile class does not regenerate its "*avances*, whereas the productive class does. This means that the productive class gets back the capital that it launches into circulation, whereas the sterile class does not. If capital returns to the productive class but only transits through the sterile class, then we are to conclude that the productive class is the point of departure of the circulation of social capital (and the point of return, as well), whereas the sterile class, is in fact, a transit place for the capital which starts its circulation from the productive class.

Noting these facts about the way in which the "*Tableau*" is constructed allows us to get a clearer understanding of its actual significance. The productive class represents the capital of the economy. The sterile class is a salaried class: it provides labor power as well as production goods. The class of landlords is the class of the receivers of the income of capital. It is a direct parasite of the productive class, and an indirect parasite of the sterile class, as far as the sterile class is maintained by the productive class. Though the productive class is the point of return in the circulation of capital, the landowners, on the basis of the property of land, constitute themselves as the sole propietors of the surplus value yielded by social capital, and, into a spureous

point of arrival for the flow of income artificially disconnected from the circular flow of capital.

"Classe des propiétaires: REVENU de *deux milliards* pour cette classe: il s'en dépense *un milliard* en achats à la classe productive et *l'autre milliard* en achats à la *classe stérile*."

Contrary to what he did when describing the nature of the payment obtained by the productive class, when treating of the class of propietors Quesnay uses not the term "*avance*", but that of "*revenu*". As we have already seen "*revenu*" is but another synonym of "net product" and "income".

"Classe stérile: AVANCES de cette classes de la forme *d'un milliard* qui se dépense par la *classe stérile* en achats de matieres premieres à la *classe productive*." (Quesnay, in Daire, 1846, 59)

After having introduced the "*dramatis personae*" and defined the relations existing among them, we can look at the flow of money presented in the "*Tableau*":

"Ainsi la *classe productive* vend pour *un milliard* de productions aux *propriétaires du revenu*, et pour *un milliard* à la *classe stérile* qui y achete les matieres premieres de ses ouvrages.

Le *milliard* que les *propriétaires* du *revenu* ont dépensé en achats à la *classe stérile*, est employé par cette classe, pour la subsistance des agens dont elle est composée, en achats de productions prises à la *classe productive*.

TOTAL des achats faits par les *propriétaires* du *revenu*, et par la *classe stérile* à la *classe productive*, ci. 3 milliards.

De ces *trois milliards* reçus par la *classe productive* pour *trois milliards* de productions qu'elle a vendues, elle en doit *deux milliards* aux propriétaires pour l'année courante du revenu, et elle en dépense *un milliard* en achats d'ouvrages pris à la *classe stérile*. Cette dernière classe retient cette somme pour le remplacement de ses avances, qui ont été dépensées d'abord à la *classe productive* en achats de matieres premieres qu'elle a employées dans ses ouvrages. Ainsi ses avances ne produisent rien; elle les dépense, elles lui sont rendues, et restent toujours en réserve d'anée en année." (Quesnay, in Daire, 1846, 59-60)

These flows are represented in the today ubiquitous 1766 version of the "*Tableau*".

"Les matieres premieres et le travail pour les ouvrages montent les ventes de la *classe stérile à deux milliards*, dont *un milliard* est dépensé pour la subsistance des agens qui composent cette classe; et l'on voit qu'il n'y a là que consommation ou anéantissement de productions, et point de réproduction; car cette classe ne subsiste que du payement successif de la rétribution dûe à son travail, qui est inséparable d'une dépense employée en subsistances, c'est-à-dire *en depenses de pure consommation, sans régénération de ce qui s'anéantit par cette dépense stérile, qui est prise en entier sur la reproduction annuelle du territoire*. L'autre *milliard* est réservé pour le remplacement de ses avances, qui, l'année suivante, seront employées de nouveau à la *classe productive* en achats de matieres premieres pour les ouvrages que la *classe stérile* fabrique." (Quesnay, in Daire, 1846, 60)

The profit made by the sterile class is but a part of the cost of the actual amount of labor employed in this sector. Note that the sterile class is sterile or unproductive because its labor does not give rise to any surplus value. It certainly gives rise to value, but to an amount of value which is the same in magnitude as that destroyed by unproductive industry. This shows that income, and, therefore, "*produit net*" and "*revenu*", are not the money value of commodities, but surplus value. The mere fact of exchanging a commodity other than money for money does not give rise to an income for the seller of the commodity other than money. If a capital investment does not give rise to surplus value, then it gives rise to no income, even though the investor recoups the full capital that he invested.

If the sterile class lives on the retribution to its labor, then it is actually a salaried class in relation to the productive class.

"Des *cinq milliards* de réproduction totale, les *propriétaires du revenu* et la *classe stérile* en ont acheté pour *trois milliards* pour leur consommation: ainsi il reste encore à la *classe productive* pour *deux milliards* de productions; cette classe a acheté en outre pour *un milliard* d'ouvrages à la *classe stérile*, ce qui lui fait un fonds annuel de *trois milliard*, lequel est consommé par les divers agents occupés aux différens travaux de cette classe, qui sont payés par les avances annuelles de la culture, et aux diverses réparations journalieres du fonds de l'établissement, qui sont payés par les intérêts dont on va parler.

Ainsi la dépense annuelle de la classe productive est de *trois milliards*, savoir *deux milliards* de productions qu'elle retient pour sa consommation, et *un milliard* d'ouvrages qu'elle a achetés à la classe stérile.

What Quesnay calls "interests" on fixed capital are actually amortization charges; they are expenses required to make up for the wearing out of fixed capital, that is, for the consumption of fixed capital and the subsequent annihilation of value consequent upon the annihilation of the productive goods that are the subject of value. Thus, the use of the word "interest" to refer to the amortization charges of fixed capital is misleading.

It seems that Quesnay gives two different versions of the structure of the capital investment of the productive class, but this is a false impression. In the first paragraph, he decomposes as follows the capital investment of the productive class: 2 milliards in productive goods produced by the productive class and 1 milliard of productive goods produced by the sterile class. In the paragraph right below, he provides another version: 2 milliards in circulating capital and 1 milliard in fixed capital. Thus, the 1 milliard obtained from the sterile class seems to be the same as the loss in value of the fixed capital which is to be made good by getting the replacement from the sterile class. This is, I think, what Quesnay had in mind. The productive goods that make up fixed capital are not produced by the "*cultivateurs*", but by the manufacturers, that is, the steriles. The purchase of productive goods by the productive class from the sterile class is actually the amortization of the part of the fixed capital consumed within this year, which is to be made good out of the output of this year. Let me make a further remark on this point:

"On a remarqué plus haut (…) que les *avances primitives* étaient d'environ cinq fois plus fortes que les *avances annuelles*: dans l'hypothèse actuelle où les *avances annuelles* sont de *deux milliards*, les *avances primitives* sont donc de *dix milliards*, et les intérêts annuels d'*un milliard* ne sont que sur le pied de dix pour cent." (Quesnay, in Daire, 1846, 62)

It is clear that 10% of 10,000 is 1,000. Note, however, that the interest rate is not given; what is given is the value of fixed capital and the amount of yearly interest. From these two data, Quesnay determines a rate, which is said by him to be a *rate of interest*. However, what is this interest? What role does it play in this story? What need has Quesnay of resorting to the price of money in his "*Tableau*"? Is Quesnay's "interest rate" the profit rate at which the capital of the productive class yields profit?

It does not seem to be so. If fixed capital yields profit at a 10% rate "*per annum*", then logical coherence demands that circulating capital should also yield profit at the same rate of 10% "*per annum*" But Quesnay tells us that an investment of 3 milliards gives rise to a gross product of a value of 5 milliards. The ratio of net income to capital is not that of 1 to 10, but that of 2 to 3: something does not work here. Besides this, Quesnay does not take into account compound interest, even though fixed capital lasts longer than one year, which means that his calculations are hopelessly inaccurate.

It is also to be noted that Quesnay does not tell us anything about the fund that financed the purchase of fixed capital. Concretely, we are not told whether it was a fund already in possession of the productive class or loan capital. If it was not loan capital, then the productive class does not have to pay any interest, in which case it is obviously senselesss to speak of an interest rate. Is Quesnay implying that the productive class took a loan from the bankers, who belong to the sterile class, at a price of 10% "*per annum*"? It does not seem to be so either. If the productive class sells its output at a price which is just sufficient to pay for interest charges and the amortization of circulating capital, it is clear that fixed capital is not amortized, which means that fixed capital is left to decay, and, more concretely, that it will fully decay within ten years. However, Quesnay stresses that the output of the productive class must cover the amortization of the fixed capital, in addition to that of the "*avances annulles*" or circulating capital:

"Ces *trois milliards* forment ce qu'on appelle LES REPRISES *de la classe productive*; dont *deux milliards* constituent les avances annuelles, qui se consomment pour le travail direct de la réproduction des *cinq milliards* que cette classe fait renaître annuellement, pour restituer et perpétuer les dépenses qui s'anéantissent par la consommation: *l'autre milliard* est prélevé par cette même classe sur ses ventes pour les intérêts des avances de son établissement. On va faire sentir la nécessité de ces intérêts. (...)

Les intérêts des avances de l'établissement des cultivateurs doivent donc être compris dans leurs *reprises annuelles*. Ils servent à faire face à ces grands accidens et à l'entretien journalier des richesses d'exploitation, qui demandent à être réparées sans cesse." (Quesnay, in Daire, 1846, 61-2)

The text, together with its context, suggests strongly that the word "interest" has been misleadingly used, at least according to modern usage: what Quesnay had

actually in mind when referring to the interest of 10% on the value of fixed capital, which was 10 milliard, was not the price of a money loan, and, therefore, any interest, but simply the amortization charges of fixed capital. What he had actually in mind was a capital investment of 10 milliards which is to be replaced within a period of ten years, that is, a capital investment the turnover period of which is ten years. If an investment of 10 milliards is to be amortized in 10 years, then it makes sense to say that the amortization corresponding to each year is 1 milliard. The following quotation provides further support for my interpretation:

"Si l'on considere la quantité des dépenses auxquels ils doivent subvenir; si l'on songe à l'importance de leur destination; si l'on réfléchit que sans eux le payement des fermages et de l'impôt ne seroit jamais assuré, que la régénération des dépenses de la société s'éteindrait, que le fonds de richesses d' exploitationet par conséquent la culture disparaîtraient, que cette dévastation anéantirait la plus grande partie du genre humain, et renverroit l'autre vivre dans les forêts; on sentira qu'il s'en faut beaucoup que le taux de dix pour cent, pour les intérêts des *avances* périssables de la culture, soit un taux trop fort.

Nous ne disons pas que tous les cultivateurs retirent annuellement, outre leurs *avances annuelles*, dix pour cent pour les *intérêts* de leurs avances primitives; mais nous disons que telle est une des principales conditions d'un état de prospérité; que toutes les fois que cela n'est pas ainsi chez une nation, cette nation est dans le dépérissement, et dans un dépérissement progressif d'année en année. (…)

La somme totale de ces intérêts se dépense annuellement, parce que les cultivateurs ne les laissent point oisifs; car, dans les intervalles oú ils ne sont pas abligés de les employer aux réparations, ils ne manquent pas de les mettre à profit pour accoître et améliorer leur culture, sans quoi ils ne pourraient pas subvenir aux grands accidents. Voilà pourquoi on compte les intérêts dans la somme des dépenses annuelles." (Quesnay, in Daire, 1846, 62-3)

Thus, "les *intérêts* des avances primitives" are not interest, but the yearly amortization quotas corresponding to a linear amortization plan for an investment on fixed capital of the amount of 10,000 milliards which is expected to last for ten years.

2. Rectification of Some Miscalculations by Quesnay

The "*Tableau*" describes the flow of money among the three social classes that make up the economy. Looking at the "*Tableau*" we can see the following figures. The

"*produit brut*" of agriculture is the equivalent in money of 5,000 millions of livres: this is the volume of the sales proceedings obtained by the farmers, as can be read in the "*Tableau*". Here, the "*produit brut*" is different from the "*produit net*", (this is why agriculture is said to be productive): the "*produit net*" is 2,000 millions of livres, and it is the aggregate rent of of land. This means that the capital invested in agriculture has been 3,000 millions of livres, which must be found somewhere in the "*Tableau*". 1,000 millions of this sum is the purchases from farmers to manufacturers represented in the "*Tableau*". The remaining 2,000 millions are purchases from farmers to farmers, and, accordingly, do not appear in the "*Tableau*", simply because the "*Tableau*" only records transactions in money between classes that are different.

The value of the output of the sterile class is the equivalent in money of 2,000 millions of livres. This class is unproductive and, therefore, it does not produce any value over production cost; accordingly, "produit net" is the same as "produit brut". The sales proceedings obtained by the manufacturers are of 2,000 millions of livres, as can be read in the "Tableau"; the investment required to produce these output was of 2,000 millions: the sales of farmers to manufacturers.

As it is well known, the figures given in the "*Tableau*" are inconsistent. Marx had already noted, rightly, that the aggregate "*produit brut*" is not 5,000 millions of livres, but 7,000 millions, which is the sum of the "*produit brut*" of the agricultural sector (5,000 millions of livres) and of the manufacturing sector (2,000 millions of livres). Thus, the value of total input is 5,000 millions of livres. 3,000 millions is the investment in agriculture, which can be decomposed in two parts: 2,000 millions of agricultural inputs in agriculture and 1,000 millions of manufactured input to agriculture. The remaining 2,000 millions is the investment in manufactures: it comes exclusively from agriculture; thus, the manufacture input to manufacture is zero.

Since agriculture is productive because nature grants a free gift to mankind, an investment of 5,000 millions of livres gives rise to an income of 7,000 of livres. 2,000 millions of these 7,000 is not necessary to keep production going at the same level, and thus can be consumed without thereby impairing the capital of the economy. This is the income of the economy, the "*produit net*", aggregate income or added value. Added by nature, according to Quesnay.

According to the "*Tableau*", aggregate income is *not* equal to the value of aggregate output; indeed, the former is 2,000 millions of livres, whereas the latter is 7,000 millions of livres. If one adopts the view currently held by modern textbooks, one should say that the Physiocrats are wrong: aggregate income must be 7,000 millions of livres because the value of aggregate output is 7,000 millions of livres. The total sales in the economy are said to be 7,000 millions of livres: this means that 7,000 millions of livres have been paid in exchange for goods: therefore, 7,000 millions of livres have circulated through the economy and total income cannot fail to be 7,000 millions of livres.

The "*Tableau*" says that the value of the final goods produced in the economy is 7,000 millions of livres. This is the value of the money that has been exchanged for the full output of goods: therefore, aggregate income must be 7,000 millions of livres. Of these 7,000 millions, it is true that 5,000 millions of livres is the value of the production goods consumed to produce a value of 7,000 millions of livres. It would be a mistake, a double counting, says the current view, to reckon this value apart from the value of the intermediate goods consumed as input, and to say that the value of aggregate output is 12,000 millions of livres: 7,000 millions of final goods and 5,000 millions of intermediate goods. The value of the input of intermediate goods (5,000 millions of livres) is already included in the value of the output of final goods (7,000 millions of livres). 7,000 millions of livres is the value of the output of final goods and, as the current view holds, the aggregate value added in the economy during the period in question.

Then, I ask: Value added to which value? According to the "*Tableau*", land adds a value of 2,000 millions of livres to an initial value of 3,000 livres, so that the value of the final product of the agricultural sector is 5,000 millions. Since manufacture is sterile, it does not give rise to any value added, so that the value of the product of an investment of 2,000 millions is again 2,000 millions. Therefore, aggregate value added in the economy as a whole is 2,000 millions, not 7,000 millions. If aggregate income is equal to aggregate value added, then aggregate income is 2,000 millions, the value of "*produit net*", not 7,000 millions, the value of "*produit brut*", as a current textbook would hold.

3. The "*Tableau*" As an Input-Output Table

In his "*Economic Theory In Retrospect*" Blaug explains the significance of Quesnay's "*Tableau*" by translating it into an input-output table. This way of understanding the "*Tableau*" is not Blaug's, but was introduced, as far as I know, in 1955 by Almarin Phillips, in a paper entitled "*The Tableau Economique As a Simple Leontief Model*" (Phillips, 1955). It has proved to be a success and has become the standard interpretation of the "*Tableau*"; its presence in Blaug's well known textbook bears witness to this fact.

For the sake of simplicity, I will not focus myself on Phillips, but on Blaug's excellent summary of it, which loses nothing substantial and is shorter. Blaug writes:

> "The process of circulation is as follows: the gross value added by agriculture is 5 thousand, 3 thousand of which constitute costs of production incurred in cultivation." (Blaug, 1998, 26)

Therefore, according to Blaug himself, the gross value of the product of the agricultural sector is 5 thousand. Of these 5 thousand, we have to deduct 3 thousand as production cost, which implies that we have a net product of 2 thousand.

> "Farmers use two fifths of their own output for working capital; one fifth is sold to the 'sterile' artisans in exchange for goods required to replace worn-out fixed capital. Since farmers receive only 'wages of management' -it is land that is productive, not their labour- the remainder goes to landowners as rent. The landowners in turn exchange half of their 2 thousand revenue for manufactured articles, while the 'sterile' artisans purchase 2 thousand worth of raw materials and foodstuffs from the agricultural sector. The whole process may be conceived of in real terms, with three fifths of output entering into circulation, or, as Quesnay suggested, it may equally well be pictured in money terms. At the beginning of the process, the farmers are in possession of the entire money stock of the economy (2 thousand). They pay this to landowners to purchase 'rental services', who in turn spend it on foodstuffs and fabricated commodities: the farmers now spend the 1 thousand just received to replace fixed capital, and the artisans spend their total receipts of 2 thousand on agricultural products. At the end, the farmers have received 3 thousand and spent 1; they are back where they started. The net effect of the sterile sector is nil, and the 2 thousand of money is paid out once more to landowners as a new cycle of production begins." (Blaug, 1998, 26-7))

Quesnay says nowhere that the farmers purchase "rental services" from the

landowners. This is how Phillips and Blaug (and virtually everybody) interprets Quesnay. They reason as follows: since it is a fact that the farmers pay rent to the landlowners, then there must be an equivalent good transferred from the landowners to the farmers. The missing good is assumed to be "rental services", an expression that does not appear in Quesnay. And with good reason, because Quesnay did not view the payment of rent as a purchased of anything. In actual fact, and contrary to Blaug, Quesnay says that, by the payment of rent, the class of farmers purchases nothing from the class of landowners. It is not a relation of exchange. The texts quoted above make this point sufficiently clear, but, for the sake of clarity, I quote again a text on the class of landlords:

"La *classe des propriétaires* comprend le souverain, les possesseurs des terres et les décimateurs. Cette classe subsiste par le revenu ou *produit net* de la culture, qui lui est payé annuellement par la classe productive, après que celle-ci a prélevé, sur la reproduction qu'elle fait renaître annuellement, les richesses nécessaires pour se remburser de ses avances annuelles et pour entretenir ses richesses d'exploitation." (Quesnay, in Daire, 1846, 58)

The landowners get the surplus value of the economy in the shape of money when the farmers pay rent to them. The landlords get the "*produit net*", which is the surplus value freely granted by nature to man. This means that the landlords give out nothing in exchange for rent: if they did, what they get as rent would not represent surplus value or "*produit net*", but a production cost, a resource consumed within production, which is the contrary to what Quesnay says.

Having contradicted Quesnay's fundamental distinction, Blaug goes on:

"The *Tableau,* however, can also be pictured with leads as well as lags, each sector simply spending in each income period the receipts of the same period. In this case, the whole argument can be represented by a two-way transaction diagram in the manner of a modern Leontief input-output table: as in Leontief's system, all factors required to produce a good are used in fixed proportions and the value of a sector's output is entirely exhausted by the sector's total payments to other sectors.

A three-sector closed Leontief model can be represented by three simultaneous equations

$$(1-a_{11})X_1 \quad -a_{12}X_2 \quad -a_{13}X_3 \quad = 0$$

$$-a_{21}X_1 \quad +(1-a_{22})X_2 \quad -a_{23}X_3 \quad = 0$$

$-a_{31})X_1 \quad -a_{32}X_2 \quad +(1-a_{13})X_3 \quad = 0$

where the X's stand for the annual output of the three sectors and the a_{ij} coefficients for the input-output relations -the *i*th sector's product (read across the rows) is used as input to produce a unit of the *j*th sector's output (read down the columns). The equations state simply that if $(l-a_{ij})X_i$ stands for the amount of output a sector does not itself use up, this must be equal to the amounts purchased from it by the other sectors ($a_{ij}X_j$). So, for example, reading across the first row in table 1.1, the total output of agriculture equals the amount retained by farmers, $(a_{11}X_1) = 2$, plus the amount sold to landowners and artisans, $(a_{12}X_2 + a_{13}X_3) = 3$; or the amount not retained by farmers, $(1-a_{11})X_1 = 3$, equals the amount sold to landowners and artisans, $a_{12}X_2 + a_{13}X_3 = 3$. Since $X_1 = 5$, $X_2 = 2$, and $X_3 = 2$, the input-output coefficients of the table are quickly computed in our simple case:

Table 1.1

	purchasing sector			
producing sector	Farmers	Landowners	Artisans	annual output
Farmers	2	1	2	5
Landowners	2	0	0	2
Artisans	1	1	0	2
Total Purchases	5	2	2	9

$a_{11}=2/5$, $a_{12}=1/2$, $a_{13}=1$, $a_{21}=2/5$, $a_{22}=0$, $a_{23}=0$, $a_{31}=1/5$, $a_{32}=1/2$, $a_{33}=0$.

When the a_{ij}s are substituted into the equations given above, we obtain:

$+ 0.6(5) -0.5(2) - 1(2) = 0,$

$-0.4(5) + 1(2) \quad -0 \quad = 0,$

$-0.2(5) - 0.5(2) + 1(2) = 0.$

This set of equations provides a scale model of the economy, given the output of the three sectors, the *Xs,* or, as Leontief would say, 'the final bill of goods'. The practical purpose of the construction is limited to evaluating the effects of changes in the final bill of goods small enough to leave the input coefficients unchanged. This is a limitation inherent in the *Tableau* itself, which has after all no other purpose than to illustrate the phenomenon of mutual interdependence between industries." (Blaug, 1998, 27-8)

As the reader can see, Blaug's reinterpretation of the "*Tableau*" as an input-output table carries the odd implication that the total gross product of the economy is of 9 thousand. The same feature is present in Phillips, whose table Blaug reproduces.

Certainly, Quesnay was inconsistent with his own premises when he said that the value of the gross product was 5 thousand: the right view is, as I explained above, that it is of 7 thousand. Note, however, that Blaug is also at variance with this figure. Whence does he deduct that the gross product of the economy is 9 thousand? Moreover: if, as he said, the net product of agriculture, and, therefore, of the economy, was 2 thousand, where is the implied production cost of 7 thousand?

The reason why Blaug's version of the "*Tableau*" shows 9 thousand as value of gross product is because he mistakenly represents the farmers as purchasing productive goods or services from the landlords. Look at the input structure of agriculture. It says that a product the value of which is 5 thousand is produced by an input, that is, an investment, which has three parts: 1) agricultural goods: 2 thousand; 2) goods produced by the landlords: 2 thousand; 3) goods produced by the artisans: 1 thousand. The "good" supplied by the landlords is the permission to cultivate the land. For Quesnay, this is no productive service at all. The class of landlords , as landlords, provides no productive service at all; Quesnay's point is, precisely, that the rent they get is not required to make up for the consumption of any good in production. If the rent of land were the payment to the landowners in exchange for their contribution to production, then the rent of land would be an "*avance*", capital, and, therefore, a production cost. It would represent the value of some good consumed within production; concretely, the production cost of some type of services.

Quesnay' says exactly the contrary: the rent of land represents the "*produit net*", the value which is superfluous to make up for the consumption of productive goods. To say that the landowners "sell" their "productive services" to the farmers is the same as saying that the subjects of a king "buy" "services" from him, that the tributes they pay to the king represent the "purchase" of "services" provided to them by the king. This view implies, among other things, that the rent of land does not represent a "*produit net*"; indeed, that no "*produit net*" or surplus value exists. An interpretation that views Quesnay as holding that surplus value does not exist is like an interpretation of Marx as holding that captal does not exist.

The picture of the relations among the classes in the economy that emerges from the texts of Quesnay is very different from that of a class of landlords "selling services"; it may be summed up as follows:

The landlords, being the owners of land, are also the owners of the produce of land. But in order to cultivate the land, they need the labor of the farmers and of the artisans. This means that they have to feed these people, and, therefore, that they cannot consume themselves the whole of what land produces, even though the whole of it is, in fact, theirs. Then, the landlords allow the farmers and the artisans to keep for themselves what is necessary to maintain their productive resources. The landlords do not have to give out anything in exchange for rent simply because they already had the property of whatever land produces. It is rather the farmers and the artisans who are purchasing their maintenance from the landlords by selling services to them.

That the Phillips-Blaug input-output table is built on premises contrary to Quesnay's can also be shown by another feature. According to Blaug's "*Tableau*", the value of gross product is 9 thousand. But the value of the inputs consumed in production is also 9 thousand. If the value of aggregate output is equal to the value of aggregate input, where is Quesnay's "*produit net*"? If the value that returns to the investor is the same as the value that the investor advanced, where is his profit? The answer is: as Blaug's "*Tableau*" stands, nowhere: there is no surplus value, no income, no "*produit net*". Quesnay's central contention that the "*produit net*" exists and that it is the surplus matter granted freely by nature to man disappears. In terms of accounting, the existence of "*produit net*" is shown by the fact that the value of aggregate output is greater than the value of aggregate input. The excess is the income of the economy; the part of the "*produit brut*" which is not "*produit net*" is the capital of the economy. The value of aggregate output is not equal to the value of aggregate income: the difference is aggregate capital. It is not the case that the full value of output becomes income for somebody in the economy: a part of it must remain as capital. Let me modify the Phillips-Blaug transformation of the "*Tableau*" into an input-output tables on the basis of what I regard as Quesnay's theory.

The table put forward by Phillips-Blaug is:

	purchasing sector			
producing sector	Farmers	Landowners	Artisans	annual output
Farmers	2	1	2	5
Landowners	2	0	0	2
Artisans	1	1	0	2

Total Purchases	5	2	2	9

The table that I put forward is:

	purchasing sector			
producing sector	Farmers	Landowners	Artisans	annual output
Farmers	2	1	2	5
Landowners	0	0	0	0
Artisans	1	1	0	2
Total Purchases	3	2	2	7

In my table, annual otuput is not 9 thousand, but 7 thousand, which is in agreement with the rectified "*Tableau*". Note that, in the table that I put forward, the rent of the landlords is not a payment for the services of any productive factor involved in agriculture; in other words: they contribute nothing to production. This is why I write "0" where Phillips and Blaug write "2". Wages and profits are payments in which money is exchanged for productive goods, for values that are consumed in production: wages replace the wear-and-tear of the labor force of the working class and profits replace the wear-and-tear of the labor force of the entrepreneurial class. On the contrary, the rent of land is a payment to the landlord independent of the contribution of the landlord to agricultural production; in other words: it is the payment to the landlord as landlord, not as worker or seller.

The Phillips-Blaug view, in fact, implies that rent is on the same footing as wages or profits, that is, that it is a production cost, a payment that must be devoted to make up for the value of goods consumed in production. This is most at variance with Quesnay's ideas and standing texts. To hold that the rent of land is the payment for the "rental services" of the landlord is to contradict Quesnay, for it amounts to saying that the rental services of the landlord are on the same footing as the labor services of the farmers or the artisans.

As I said above, Marx noted rightly that, as the "*Tableau*" stands, the gross product is not 5,000 milions of livres, but 7,000 millions; 5,000 millions of livres is the gross product of the agricultural sector, and it also happens to be the value of the resources invested on agriculture and manufacture. If my table of coefficients is

accepted, then the gross produce is, as Marx held, 7,000 millions of livres. According to Blaug, it is 9,000 millions of livres, a figure for which there is no justification except a misunderstanding of Quesnay.

Note also that, in Blaug, the value of the investments undertaken in agriculture is 5,000 millions of livres, which is the same as the sales proceeds to agriculture. In other words: according to Blaug, total input in agriculture is the same as total output. If this were Quesnay's view, on what ground could he claim that agriculture is productive? Blaug's view clashes against the very definition of "productive" according to Quesnay. Quesnay said that agriculture was productive because the value of output was greater than the value of input; according to Blaug's table, on the contrary, the value of input is equal to the value of output, also in agriculture. Then, where is surplus value? Nowhere, because Blaug holds that the rent of land is an input in agriculture: it is a cost of production. In order to be consistent, he is forced to count twice the rent of land: once as an input and again as output. This is why he gets 9,000 millions as value of aggregate output.

In my table, an investment of 3,000 millions in agriculture gives rise to a produce the value of which is 5,000 millions. In my table, agriculture is "productive" in Quesnay's sense because the value of output is greater than the value of input. The excess is provided for by nature.

There is also room for a further minor change that brings my rectified table closer to the spirit of Quesnay's "*Tableau*". The sales proceeds of the "landlord sector" is zero, as it should be, but it seems that the landlords purchase inputs, namely, agricultural products (1,000 million of livres) and manufactured products (another 1,000 million of livres). However, it is easy to see that these purchases do not represent purchases of inputs, that is, investment. Note also that the landlords are actually giving nothing in exchange for the goods that they purchase. This may sound odd, because the "*Tableau*" says itself that the landowners give out in money the equivalent of the goods that they get from the farmers and the artisans. The point is, however, that they got this money for nothing because they got the rent of land for nothing; ultimately, they get goods from the farmers and the artisans for nothing.

The consumption of the landlords does not produce any consumable good and does not make up for any consumption of production means: they are not a productive

sector. Accordingly, it would be best to make a matrix which has two rows and three columns. The two rows correspond to the two alternative investments of capital, namely, agriculture and manufacture; the three columns to the three sectors that consume the output of the economy. The consumption of the farmers and the artisans is the production cost and must be minimized; the consumption of the landlords is the "*produit net*" or true income and must be maximized. We may represent this as follows:

	purchasing sector			
producing sector	Farmers	Landowners	Artisans	annual output
Farmers	2	1	2	5
Artisans	1	1	0	2
Total Purchases	3	2	2	7

The landlord class consumes without having produced, or, what amounts to the same, it is a purchaser without having been a seller. This is why the input-output table cannot have the same number of rows as of columns. Columns one and three in my input-output table correspond to the investment in agriculture and manufacture, respectively. Column two is income, that is, the net product got by the landlords; finally, the fourth column is gross product. Gross product minus aggregate investment or cost of production is net product or income. In other words: gross product minus capital is equal to income. We may rework the table as follows:

	purchasing sector				
producing sector	Farmers	Artisans	Gross Output	Net Output	Landlords
Farmers	2	2	5	2	1
Artisans	1	0	2	0	1
Total Purchases	3	2	7	2	2

The total surplus value resulting from the multiplication of matter freely granted by nature to society is 2 thousand. It was fully originated in the agricultural sector as far as value in exchange is concerned. The landlords get it as rent, and as money, which means that they get the value in an abstract form. This value is the

"*produit net*". But the landlords do not spend the whole of their rent on agricultural goods. Instead, they choose to purchase 1 thousand worth of agricultural goods and 1 thousand worth of manufactured goods. This is why columns "Net Output" and "Landlords" show the same total (2,000), but a different structure.

This means that, as far as value in use is concerned, the economy can allocate to landlords 1,000 worth of manufactured goods without impairing production. This is possible because the sterile class can produce goods worth 1,000 without impairing production. And this is possible because the productive class can provide the sterile class with 1,000 worth of agricultural goods without impairing production. These goods, the value of which remains the same despite the change in form operated by the labor of the manufacturers, are the ultimate source of the part of the output of the manufacturers which is consumed by the landlords. This consumption is possible because it is independent from the requirements of production.

Note that the investment in the farming sector is 3,000, while the value of its output is 5,000. The excess of 2,000 is the surplus of matter granted by nature to mankind for nothing: the surplus value or "*produit net*". In manufacturing, an investment of 2,000 gives rise to an output which is worth just 2,000, and, which, therefore, gives rise to no surplus value.

4. Leontief's Input-Output Tables in the Light of the "*Tableau*"

We have just seen that the Phillips-Blaug presentation of the "*Tableau*" as an input-output table, far from providing a clarification of Quesnay's conceptual framework, distorts it so seriously that attributes to it the view that there is no "*produit net*", that is, that there is no distinction between capital and income. In view of this, one might ask: does this mean that Leontief's input-output tables are built on a fundamentally erroneous basis? Is the "*Tableau*" a rejection of the input-output tables? Do the input-output tables demonstrate in any way that, contrary to Quesnay, there cannot be any "*produit net*"? Do not the input-output tables show that the aggregate value of output is equal to aggregate income?

I do not hold that there is an opposition between Quesnay's "*Tableau*" and Leontief's input-output tables. But I do hold that any conceptual framework for the

analysis of a capitalistic economy must acknowledge, in some way or other, Quesnay's distinction between capital and income. In other words: it must admit the existence of surplus value. This means that, contrary to Leontief's own claim (see, for instance, Leontief, 1951, 14), I hold that the input-output tables do *not* show that GNP is equal to aggregate income; moreover, if correctly read, they show the contrary. Instead of looking at the "*Tableau*" from the input-output tables, let me have a look at the input-output tables from the "*Tableau*".

The idea that the input-output tables are a different layout of the "*Tableau*" was originated not by Phillips, but by Leontief himself. In his 1951 book "*The Structure of the American Economy*", he claimed that his input-output tables are a different presentation of the Physiocratic "*Tableau Economique*" and that his aim was to build a "*Tableau*" for the US economy with the aid of up-to-date mathematical tools (Leontief, 1951, 11-2).

Things got confused when it came not to the construction of the tables, but to the interpretation of the information displayed in them. It was at this point when Leontief brought into the picture a principle of the truth of which, I dare say, he was convinced well before he even conceived of the idea of translating the "*Tableau*" into input-output tables. Note, however, that any argument that may be said to establish that GNP is equal to aggregate income cannot be provided by the tables. The reason is that this principle is the answer to a theoretical question which is not to be decided on the basis of empirical data. Instead of reading the tables with Quesnay's concept of "*produit net*" in mind, Leontief took as a premise the today standard erroneous view originated in Smith about two hundred years ago.

He thought that the tables were in agreement with this principle because he rightly saw how the tables made clear that there must be a sale for every purchase and a purchase for every sale. In other words: he saw that the tables show in a clear way that total purchases in an economy must be equal to total sales. His mistake was to believe that the true statement that every purchase is a sale and every sale a purchase implies that GNP is equal to aggregate income, that the full value of the output of an economy becomes income for some economic agent in that economy. This thesis is false in a capitalistic economy, the constitutive end of which is the accumulation of capital. The

premise of the reasoning is true, but the conclusion is false: the explanation is that the inference is not good.

In order to see the fallacy, it is good to look at a feature of Leontief's input-output tables which has to do with their very name. The feature is that, as a matter of fact, Leontief's tables do not relate inputs to outputs, but sellers to purchasers. Leontief looks at the industries that make up an economic system as sellers or purchasers; whether they provide goods that only serve as input or only as output or as both is not his criterion of classification. Thus, instead of "input-output" tables, it would be more accurate to name them "seller-purchaser" tables. Thus, we can see that, as a matter of fact, Leontief identifies "seller" with "input", and "purchaser" with "output". This is a mistake, because seller is not the same as "seller of input" and "purchaser" is not the same as "purchaser of output". From the true thesis that every sale is a purchase and every purchase a sale, Leontief infers that the aggregate value of inputs cannot fail to be equal to the aggregate value of output. This proposition implies that, contrary to Quesnay, there cannot exist any surplus value, that is, any "*produit net*". Thence the idea that there is no distinction between capital and income, that the full value of output becomes income in the aggregate.

If Leontief, or Phillips and Blaug, held to Quesnay's concept of "*produit net*", they could see a different message amidst the mass of empirical information. The tables show that the producers of consumption goods purchase production goods in order to make up for their capital consumption. They also show that the producers of production goods purchase from each other the goods required to make up for capital consumption. It is true that the producers of production goods get consumption goods when they exchange their output (production goods) from part of the output of the producers of consumption goods. But they also have to make up for their own capital consumption and, accordingly, purchase from each other. If we look at the system as a whole, we can see, as Quesnay rightly did, that there is a part of the value of national output which is enclosed within production, which can never be consumed independently of production: this is aggregate capital or the total "*avances*". The value of the part of the national output that makes up for aggregate capital consumption cannot become income for anybody in a capitalistic economy. Aggregate income is the excess of the value of total output over what is required to make up for capital consumption: it is what can be

consumed without encroaching upon capital. The existence of surplus value can give rise to a class of people who are purchasers without being sellers. In Quesnay's "*Tableau*", these are the landlords, and the value which circulates as money through their hands represents formally the flow of aggregate income.

Leontief seems to be puzzled by the fact that the process of circulation of capital and of income is carried out by means of money. Since all that is produced is sold to somebody, and thus sets in motion its equivalent in money, then, he thinks, the full value of the whole of what is produced becomes income. He overlooks that all the producers are purchasing goods in order to make up for their capital consumption. Since all the producers have to do this, unless they perform the miracle of producing without any production goods, there must be a part of national output the value of which, certainly, circulates through the economy as money, but which represents the value of the production goods that are being consumed as a result of production. This part of output, or of its value, cannot be consumed outside production. The input-output tables do not show that GNP equals aggregate income: if correctly read, they show the contrary.

In order to locate better Quesnay's "*produit net*" in the tables, Leontief could have built *two* different tables of sellers and purchasers. The first would be a table of sellers of input and purchasers of input. This table, in which total sales of inputs are equal to total purchases of input, would give a decomposition of the input of the economy. The second table would be a seller of output-purchaser of output table. Again, total sales of output must equal total puchases of output. This second table gives a decomposition of the final goods produced in the economy. Quesnay's "*produit net*" would be the excess of total sales of outputs (=total purchases of output) over total sales of inputs (=total purchases of inputs). The excess is the surplus value yielded by the aggregate capital that has turned over during the time period in question, Quesnay's "*produit net*".

The first table would be:

	PURCHASERS OF INPUT		
SELLERS OF INPUT	Farmers	Artisans	annual input sales
Farmers	2	1	3
Artisans	1	1	2

annual input purchases	3	2	5

This gives the structure of inputs in the "*Tableau*", which is the exchanges among producers of production goods. The total value of the productive goods traded in the economy is of 5,000 millions; this is an alternative way of sating that the capital that has turned over during the time period in question represents a value of 5,000 millions. Now it comes the sellers of output-purchasers of output table. Note that every input is the output of some productive process. According to this, the table displays all the purchases, whether of final goods or of intermediate goods, for all of them are outputs:

PURCHASERS OF OUTPUT

SELLERS OF OUTPUT	Farmers	Landowners	Artisans	annual output purchases
Farmers	2	1	2	5
Artisans	1	1	0	2
Total Purchases	5	2	2	7

Quesnay's "*produit net*" is the difference between the total value of inputs traded and the total value of outputs traded, that is, 7-5=2. The Phillips-Blaug table puts together these two tables and concludes, as Leontief, that the total value of output cannot be different from the total value of input on the ground that the total value of purchases must be equal to the total value of sales. Thus, they all forget Quesnay's point, which was that the class of landlords is purchaser without being seller. This is possible because there exists surplus value, "*produit net*". In other words: to say that there is "*produit net*" is to say that there can be a class in the economy that is purchaser without being seller.

Quesnay's "*Tableau*" is clearer than Leontief's tables on this point: the central column (corresponding to the class of landlords) bears the heading "*revenue*", that is, "income", whereas the lateral columns (corresponding to the productive and sterile classes) bear the heading "*avances*", that is, "capital". The value of output, or "*produit brut*" is greater than the expenses of production, or "*avances*", and the surplus value or income is the "*produit net*".

One may reply: if Quesnay arrived at the conclusion that the aggregate value of output is greater than the aggregate value of input, this implies that he rejected the principle that every purchase is a sale and every sale a purchase, does not it? In my opinion, it does not. Quesnay never rejected the principle that every purchase is a sale, upon which double entry book-keeping was built. On this point, he would agree with Leontief, and, for all I know, with everybody. What he rejected, rather, is that every flow of money represents a purchase-sale. If one looks at Quesnay's "*Tableau*", and to his explanation of it, it is clear enough that he distinguished the flows of money that represent flow of income from those that represent flow of capital, or, as he would say, "*les depenses de revenue*" from "*les depenses of avances*" throughout the body of the economy.

According to Quesnay, there were flows of money which did not represent a purchase-sale, that is, that did not represent debts generated by a contract of exchange. In a contract of exchange, the two parties give out and receive equal values. This thesis, against Mercantilism, is well documented in Quesnay and in other representatives of his School; therefore, I will not dwell on it any further. The point is that the fact of there being a payment in money does not imply that an exchange has taken place. It is possible that one gives out a value in money without receiving the equivalent in exchange; in fact, without receving any value at all. This is the case in the payment of rent from the farmer to the landlord.

It is clear that the farmer has a debt in relation to his landlord: he must pay the rent of land. But this relation is not a contract of exchange. The farmer pays rent without getting any equivalent value from his landlord. In fact, and this was clearer in ancient times, the property of the landlord includes not only land, but also the product of land and, even, the person of the farmer. The farmer does not transfer the property of something. The reasons is, simply, that he has not any property over the produce of land. Rather, the landlord allows him to keep some part of what is property of the landlord in order to provide fot the maintenance of the farmer. Money is cancelling a debt which was not generated by a contract of exchange, but by the existing structure of property rights.

Every payment of money cancels a debt, truly, but not every debt is caused by a sale contract. If it is caused by a sale contract, then the sale implies necessarily a purchase, but this does not apply if the origin of the debt is not a sale contract.

Conclusions

1) Quesnay held that the value of aggregate output has two parts: first, that which represents the return of aggregate capital to its point of departure (the return of the "*avances*"), and, secondly, that which represents the income of the economy ("*produit net*"). The income of the economy as a whole is what it produces over and above what is required to maintain the aggregate stock of productive means (including labor), which is but an alternative way to refer to the return of the capital originally invested. Income is the surplus value, the "*produit net*". Both current Macroeconomics textbooks and Say are wrong. There is a real distinction between capital and income in an economy the constitutive goal of which is the accumulation of capital.

2) The thesis that the full value of aggregate output is equal to aggregate income, that the full value of aggregate output is equal to aggregate value added, implies that what is valid for the individual business firm is not valid for the economy as a whole. The reason, allegedly, is that the economy as a whole has not to deal with third parties in order to maintaining the capital stock. But the right inference from this statement is that the economy has to provide for its own consumption of productive means, not that the full value produced by the economy is value added or income. The right inference is that part of the total flow of money in the economy does not represent a flow of income, but a flow of capital. Quesnay drew the right inference in his explanation of the "*Tableau*".

3) The rent of land is not a payment for any productive service rendered by the landlord to the economy. The debt that the payment of rent cancels is not originated by a contract of exchange, but by the political organization of the right of property: the landlord has the property of the land and of whatever the land produces.

4) Leontief's input-output tables do not imply that capital becomes income, that is, that the value of national output is equal to aggregate income. The information displayed in them shows the contrary.

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