

INCREASING POPULATIONS AND INDUSTRIAL STRUCTURES

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I

There are fairly close inter-relationships between increasing populations and industrial structures of occupied populations. In a so-called agricultural country where almost all peoples occupy in agriculture in consequence of less prevalence of division of labour the increase of population is very slow and fluctuating. But when the division of labour had once begun to develop in a country the industrial composition of occupied population of that country shifts from that in which the population occupied in agriculture constitutes the larger part of the occupied population to that in which the proportion of the population occupied in manufactures and minings is large, and then to that in which that of the population occupied in so-called "service industries" which include commerce, transport, liberal professions and public services with the increase of population.

For instance, in Great Britain in 1696 when the population in this country was only 5.5 million the proportion of the population occupied in agriculture was 69.6 per cent and that of the population occupied in manufactures and commerce was only 20.4 per cent. In 1811 when the population in this country had increased to 10 million the proportion of the population occupied in agriculture had decreased to 35 per cent. In 1842 when the population in this country had increased to 19 million the proportion of the population occupied in agriculture had decreased to 22 per cent, that of the population occupied in manufactures and minings had increased to 44.7 per cent and that of the population occupied in "service industries" had also increased to 32.6 per cent. And in 1931 when the population in this country had increased to 35 million the proportion of the population occupied in agriculture had decreased to only 6.4 per cent, that of the population occupied in manufactures and minings had increased to 43.9 per cent and that of the population occupied in "service industries" had also increased to 49.7 per cent.

Such a development is found also in United States, Germany and Japan. In United States of America in 1820 when the population in this country was only 9.6 million the population occupied in agriculture was 72.3 per cent, that of the population occupied in manufactures and minings was only 14.6 per cent, and that of the population occupied in "service industries" was also only 12.8

per cent. In 1880 when the population in this country had increased to 50 million the proportion of the population occupied in agriculture had decreased to 49.4 per cent, that of the population occupied in manufactures and minings had increased to 25.5 per cent, and that of the population occupied in "service industries" had also increased to 25.5 per cent. In 1935 when the population in this country had increased to 13 million the proportion of the population occupied in agriculture had decreased to 25.4 per cent, that of the population occupied in manufactures and minings had increased to 28.8 per cent, and that of the population occupied in "service industries" had also increased to 45.8 per cent.

In Germany in 1820 when the population was 26 million the proportion of the population occupied in agriculture was 78 per cent. In 1882 when the population had increased to 46 million the proportion of the population occupied in agriculture had decreased to 42.2 per cent, that of the population occupied in manufactures and minings had increased to 33.5 per cent, and that of the population occupied in "service industries" had also increased to 33.5 per cent. In 1933 when the population in this country had increased to 66 million the proportion of the population occupied in agriculture had decreased to 28.9 per cent, that of the population occupied in manufactures and minings had increased to 39.4 per cent, and that of the population occupied in "service industries" had also increased to 52.7 per cent. In Japan also in 1882 when the population in this country was 37 million the proportion of the population occupied in agriculture was 83.7 per cent, that of the population occupied in manufactures and minings was 4.8 per cent, and that of the population occupied in "service industries" was 10.1 per cent. In 1940 when the population had increased to 73 million the proportion of the population occupied in agriculture had decreased to 43.7 per cent, that of the population occupied in manufactures and minings had increased to 2.7 per cent, and that of the population occupied in "service industries" also had increased to 23.6 per cent.

II

Such shifts in the industrial composition of population may be said to be the causes and effects of the increase of the productivity of labour.

One of the explanations for the reason why such shifts in the industrial composition of population takes place with the increase of population is that set forth by F. Oppenheimer. He explains such shifts from the fact that the production in manufacture is subject to the Law of Increasing Returns while the production in agriculture is subject to the Law of Diminishing Returns.

According to his argument, "in any manufacture in which the production is subject to the Law of Increasing Returns the productive power employed in it becomes more and more prolific, in other words, the average returns of each unit of labour becomes more and more larger with the development of division

of labour". Hence in manufactures the prices of their products always oscillate around the declining exchange value and their socially necessary value that is the base of each local market value is in the long run the production price of the best equipped enterprise. On the other hand, in any agriculture in which the production is subject to the Law of Diminishing Returns the price of its product oscillates as a rule around the rising exchange value expressed by the product of manufacture and its socially necessary production value that is the base of its each local market value is in the long run always the production value of the worst equipped enterprise.

His theory of "urbanisation" that is deagrualisation is founded on this theory of "polar opposition" in price formation of the product of manufacture and that of the product of agriculture.

According to his argument, the productivity of urban peoples increases more rapidly than that of agrarian peoples because the increase of productivity of the latter is checked by the Law of Diminishing Returns. Hence the economic pressure tends to lower more rapidly in the non-agriculture than in the agriculture, as the rise in productivity implies the lowering of economic pressure. However this tendency cannot be realized because when the freedom of residence is guaranteed the competition tends to adjust all pressures by means of absorbing new labour-force into the most profitable section of production. Therefore when the both natural increases of agrarian and urban peoples are equal, a certain amount of urbanization of population is a necessary phenomenon in the progressing society.

Moreover this urbanization of population at the same time lowers the price of manufactures expressed by the raw product or, what is the same thing, raises the price of raw product expressed by the product of manufacture. This rise of the price of raw product makes it economically possible to occupy the unutilized land. Hence a certain amount of "occupation of unutilized land" is a necessary phenomenon in the progressing society.

But this Oppenheimer's theory may be said, as indicated by P. Quante, as the theory which neglects the rigidity of the demand for product of agriculture different from the elastic demand for product of manufacture.

According to this Quante's theory, "the lowering of the price of product of manufacture in one or some sections of manufacture leads in the first place to a increase of consumption of these products, then further, as a result of the reaction on other sections of manufacture, also to a increase of the consumption of the products of those sections, because that part which has been made free through that lowering of price henceforth can be applied to the needs for which have been hitherto not regarded at all or sufficiently. Moreover this expansion of demand in consequence of technical progress in manufacture counter-acts also the well-known "setting free of workers" which had been caused at first through the capitalism, because it allows to the labour-forces which had been set free the new opportunity to work in the production of consumption goods or production goods.

(Theory of overcompensation)

This expansion of satisfaction of needs caused by the lowering of prices of products of manufacture is in general possible because the needs which are to be satisfied are in principle unlimited in number and intensity. So for example, when the price of silk stockings has lowered the consumption of silk stockings can become double, triple—at any rate at pleasure can be multiplied, when the price of automobile has lowered is alike etc. Whether the consumption of the concerned good increases just in proportion to that lowering of its price or this consumption increases only in lesser (in exceptional cases also larger) quantity but in place of it the consumption of other goods newly or in larger quantity takes place—this depends on the total “system of needs” of the population and its members.

The situation of the raw products which serve the need for nourishment is opposed to this. The need for nourishment is in principle different from all other needs through the fact that it cannot increase at pleasure. The need for nourishment can not increase over the satisfaction which had been once reached.

Hence the following situation arises for the production of agriculture: When the population remains the same, the competition between some favoured farmers and less favoured ones arises through the technical progress which allows some favoured farmers a increase of production at sinking price with the aim and result of excluding the less favoured. When the population is growing certainly the additional demand for food must be got at the rising price and that whether on the old, if this is more advantageous, on the new occupied land, so long as no betterment of agricultural technique or conditions of communication takes place. But if this is case, then here finally the point on which the additional production outweighs the additional demand at the sinking price can be reached. Here the difference between the product of manufacture and that of agriculture makes its appearance: In manufactures the production can be founded newly on the base of sinking price in a enlarged scale. In agriculture the sinking of price leads not to a expansion of production (over the hither-to total needs!) but only to a exclusion of surplus people.

Hence in opposition to the theory which is represented by Oppenheimer, the increase of productivity of agricultural labour can not lead to a increase, its decrease to a decrease, of agricultural population, but the relation is revers. A relative—measured on the development of population—increase of its productivity makes the number of farmers decrease, a relative decrease makes it increase. Because the demand for food—after the satisfaction has been reached—does not increase more than the increase of population, when the productivity increases it will be unrentable for a part of farmers to carry on the agriculture. For the over-supply of food for which a sale is in no way possible makes the price soon sink and excludes the most weak competitor from market. Unlikely as in manufactures, the concerned farmer can not be protected against this effect also through a sinking of the cost. Here any lowering of cost which gives to the individual

farmers the opportunity to produce more than corresponds to the development of population, or in general allows the new business (or the enlarged business) over this demand enter into the competition struggle must reduce significantly the possibility to earn for the whole farmer class."

III

This theory of Quante is certainly sound in the explanation of the reason why the proportion of the population occupied in agriculture has lowered with the increase of population, but does not explain the reason why the proportion of the population occupied in manufactures and minings does not rise unlimited, but in place of it the proportion of the population occupied in "service industries" rises with the rise of productivity of labour. This cause may be ascribed to the fact that as the proportion of the population occupied in agriculture is conditioned by the rigidity of the demand for its product, so the growth of agriculture and manufactures is conditioned by the growth of "service industries".

To begin with, in regard with the commerce and transport which constitutes the most large part of "service industries" the growth of these industries is the essential condition for the growth of productivity in agriculture and manufactures.

It is a wellknown fact that a division of labour which is a fundamental principle of modern economy increases the productivity of labour. However in order to raise the productivity of labour by means of realizing the advantage of division of labour, it is necessary that the demand for any kind of product is not only massive and uniform but also stable and lasting. Firstly because when the demand for that kind of product is not massive and uniform any specialized man or machine, apparatus and plant etc. can not be employed gainfully. Then because when the demand for that kind of product is fluctuating and not stable, any specialized man or machine, apparatus and plant etc. is not employed all the time to the full. Lastly because the demand for that kind of product, even if not only massive and uniform but stable, not lasting and for short time, any man or machine, apparatus and plant etc. will be not employed during its life time. In these cases not the advantage but the disadvantage will be realized.

Needless to say, in order to raise the productivity of labour which depends on the largeness of such a massive, uniform, stable and lasting demand, it is necessary, as Adam Smith indicated, that the extent of market is large. Hence the larger the extent of market, the more the advantage of division of labour is realized and by means of it the more the productivity of labour increases. It needs no explanation that this enlargement of market necessitates the development of transport and commerce. Therefore the development of transport and commerce is a essential condition for the increase of productivity of labour. The more transport and commerce develops the more the advantage of division of labour is realized and by means by it the productivity of labour increases.

The same thing holds good for other industries which is included in "service industries". The development of financial business is a condition for the increase of productivity of labour, in the sense that the development of transport and commerce as well as the improvement of machine, apparatus and plant etc. in manufactures and agriculture on which the increase of productivity of labour depends, needs the money. It is also evident that the educational, medical and health services increase the productivity of labour by means of its promoting the technical ability and health. Finally, the public services also contribute to the increase of productivity of labour indirectly by means of its contribution to the maintenance of this national system of division of labour. It is due to these facts that the proportion of the population occupied in "service industries" has grown with the increase of productivity of labour. Hence this proportion may be said to be the index of the increase of productivity of labour.

IV

If this argument is sound, then above mentioned fact that the proportion of the population occupied in "service industries" has grown with the increase of population proves that in fact the productivity of labour has risen with the increase of population.

One theory on what effect has a increase of population on a productivity of labour is that represented by Malthus and Ricardo which maintains that "returns" that is the productivity of labour decreases with a increase of population. Malthus argues as follows.

"At the commencement of the cultivation of fertile country by civilized colonists, and while rich land was in great plenty, a small portion only of the value of the produce would be paid in the form of rent. The productiveness of labour being great, if nearly the whole were divided between wages and profits, the labourers might obtain a large quantity of produce, while a sufficient proportion of the whole might be left to yield large profits, and wages and profits would both be high at the same time.

As the society continued to increase, if the territory were limited, or the soil of different qualities, it is quite obvious that the productive powers of labour applied to the cultivation of land must gradually diminish: and as a given quantity of labour would yield a smaller and smaller return, there would evidently be a less and less produce to be divided between labour and profits.

If, as the powers of labour diminished, the physical wants of the labourer were also to diminish in the same proportion, then the same share of the whole produce might be left to the capitalist, and the rate of profits would not necessarily fall. But the physical wants of the labourer remain always the same: and though in the progress of society, from increasing scarcity of provisions compared with labour, these wants in general less fully supplied, and the corn wages

of labour gradually fall: yet it is clear that there is a limit, and probably at no great distance, which cannot be passed. The command of a certain quantity of food is absolutely necessary to the labourer in order to support himself, and such a family as will maintain merely a stationary population. Consequently, if poorer lands which required more labour were successively taken into cultivation, it would not be possible for the corn wages of each individual labourer to be diminished in proportion to the diminished produce: a greater proportion of the whole would necessarily go to pay the wages of labour: and the rate of profits would continue regularly falling till the accumulation of capital had ceased.

In the meantime, it will be asked, what becomes of the profits of capital employed in manufactures and commerce, a species of industry not alike that employed upon the land, where the productive powers of labour necessarily diminish: but where these powers not only do not necessarily diminish, but very often greatly increase?

In the cultivation of land, the causes of the necessary diminution of profit is the diminution in the quantity of produce obtained by the same quantity of labour. In manufactures and commerce, it is the fall in the exchangeable value of the same amount of produce.

The labour required to produce corn has a constant tendency to increase from inevitable physical causes, while the labour required to produce manufactures and articles of commerce sometimes greatly diminishes, sometimes remains stationary, and at all events increases much slower than the labour required to produce corn. When, therefore, profits fall in agriculture it becomes obviously advantageous to employ capital in manufactures and commerce than on the land: and capital will in consequence be so employed till a fall has taken place in manufactures and commercial products from their comparative abundance. But it has been shown that the value of the same quantity of labour will always remain the same; and it is evident, that if the products fall in value, while the quantity of the labour, or the value of the capital required to produce them, remain the same, profits must fall. It is further evident, that this fall must necessarily go on, till profits in manufactures and commerce have been reduced nearly to a level with these in agriculture. And thus it appears that in the progress of improvement, as poorer and poorer land is taken into cultivation, the general rate of profits must be limited by the powers of the soil last cultivated. If the last land taken into cultivation will only yield a certain excess of value above the lowest value of the capital necessary to produce it, it is obvious that profits, generally, cannot possibly be higher than this excess will allow".

This theory is, as indicated by F. Oppenheimer, inconsistent with the above mentioned fact that the proportion of the population occupied in agriculture has been falling with the increase of population. He maintains that the effect of the Law of Diminishing Returns due to the increase of population in fact has over-compensated that of the Law of Increasing Returns due to alike the increase of population. He argues as follows.

“The annual dividend has increased with the increase of population density. This is evident from the fact that the number of farmer has decreased in proportion while the number of manufacturer and merchant has increased with the increase of the population of civilized nations. Because, as indicated by Malthus, “the surplus product of farmers in its most wide meaning measures and limits the growth of that part of society which is not employed on land, so that the number of manufacturer, merchant, man of property and man of various cultural professions must be proportional just to this surplus product throughout the world”. If the population of a country were 5 million of which 80 per cent were non-farmers and 20 per cent were farmers and if the population of that country had increased to 10 million after a certain years, then if the Law of Diminishing Returns had effect, the proportion of non-farmers must decrease. Namely in above mentioned case, in the first stage four farmers could support one non-farmer. But if the Law of Diminishing Returns had effect, when the population had increased to 10-million, since the total returns increase but not in the same degree as the labour hour employed on those, there are two farmers in spite of one in the former time and returns of both farmers are larger than the half of those in the former time, but the total returns of the farmers are not twice as large as those in the former time. As the surplus product which remains after the two farmers had reserved for their needs is less than that in the former time, only less non-farmers per one farmer can live on it. Therefore it is evidently only possible when the surplus product per one farmer grows from the one time to the other time in spite of the increase in their number, that is, when the effect of the Law of Diminishing Returns has been not only compensated but over-compensated.”

V

The effect of the increase of population on the productivity of labour in the times when the national economic division of labour does not nearly prevail in consequence of prevalence of the self-sufficient house economy is very different from that in the times when such a self-sufficient house economy had been destroyed and in place of it the national system of division of labour had been established through the industrial revolution.

We had indicated that the advantage of division of labour is the increase of the productivity of labour. Hence in the times when the national division of labour does not nearly prevail, the productivity of labour is not only by nature low but, as insisted by Malthus and Ricardo, decreases with the increase of population, because in such times not the Law of Increasing Returns due to the division of labour but only the Law of Decreasing Returns takes effect. In such times since, needless to say the housing and clothing, the food is insufficient the death rate is always extraordinarily high and the natural increase of population is, as indicated above, very slow and fluctuating in spite of very high birth rate.

On the other hand, in the times when such a self-sufficient house economy had been destroyed and in place of it the national system of division of labour had been established, as insisted by Oppenheimer, the increase of population increases the productivity of labour. Because in such times it promotes the realization of the advantage of division of labour and at the same time stimulates the production by means of increasing the effective demand by promoting the capital investment.

We indicated above that the increase of the productivity of labour by means of the realization of the advantage of division of labour requires that the demand for a kind of product is massive, uniform, stable and lasting. It is evident that, as the largeness of such demand depends on the largeness of population, with the increase of population the productivity of labour increases by means of the realization of the advantage of division of labour. Needless to say, the increase of demands for products does not necessarily only on the increase of population. When the real income per head increases, even if the population does not increase, the amount of demand increases. But such demand as increased due to the increase of the real income per head is not, as a rule, so massive, uniform, stable and lasting as such demand as increased due to the increase of population. We may say in this sense that the increase of population promotes the productivity of labour.

Moreover the increase of population promotes the productivity of labour also by means of its promoting the capital investment. As indicated by Keynes, while the value of output is equal to the income in the whole society, the income as a rule is not expended in full but a part of it is saved. Hence unless the saving is outlaid for the investment in full, the output can not be sold by that amount of saving which is not outlaid for the investment and consequently the output will decrease by that amount. Now in order to be outlaid the saving for investment, it is necessary that the consumption is expected to grow at least during the life of that investment, because the investment depends not only the rate of interest, but especially, on how much the output which will be added by that investment is expected to be sold during the life of that investment. The increase of population increases the consumption outlay and at the same time promotes the investment by means of its giving the expectation that it makes the consumption outlay increase for a long future. In this sense also we may say that the increase of population promotes the productivity of labour.

Certainly against this argument may be argued that the increase of population is not the only factor to promote the investment, that the rise of the level of real income has more importance for the promotion of investment than the increase of population, that, for instance, the capital investment in the automobile factory is attractive when the population remains the same but the level of real income so much rises as the portion of it which is able to buy a automobile grows, as well as when the population is expected to increase but the level of real income remains the same, that there is besides the capital investment due to such a change in

the demand also that combined with changes in technique, that if the rate of interest lowers, the capital investment takes place in order to raise the proportion of capital to labour.

However the fact that, as indicated above, the productivity of labour has been increasing with the increase of population implies that the level of consumption has been rising with the increase of population. Hence it can not be scarcely expected that when the population remains the same, the same amount of capital investment as that due both to the increase of population and the rise of the level of consumption accompanied with it takes place, unless the drastic measures to promote the consumption such as the redistribution of income are introduced. Therefore when the population does not increase the increase of consumption must be less by the additional increase due to the increase of population and the rise of level of consumption accompanied with it than that when the population increases. And as a result of it when the population does not increase the new capital investment has to be less than that when the population increases.

Moreover, as indicated above, the rise of the productivity of labour due to the rise of the proportion of capital to labour can take place only when the demand for a kind of product is massive, uniform, stable and lasting. Hence when the population does not increase the new investment due to the rise of the proportion capital to labour is also difficult to take place. Because the additional demand due to the rise of the level of consumption which is by nature is that for the luxuries or semi-luxuries is not massive, uniform, stable and lasting. In this sense we may say that the increase of population promotes both the production and the productivity of labour by means of its promoting the consumption and the new capital investment.