CHAPTER TWELVE

LONG WAVES

THE explanation of the phenomenon of the so-called "long" waves has not advanced very far. To some extent this is a consequence of the very length of these waves: few of them have occurred. It is, therefore, particularly difficulty to establish regularities in their movement. Statistical data are, moreover, extremely scarce for the first half of the nineteenth century and still quite inadequate for the second half of that century.

The question has often been raised whether there is actually any justification for speaking of long waves. Is there anything more than an accidental alternation between increasing and decreasing tendencies? Against this skepticism, certain authors have maintained that there are indeed long waves which should be considered as actual waves. The explanation of these waves has been sought in two different directions.

MONETARY THEORIES

One group of authors has looked for an explanation in the monetary sphere. None of these has tried strictly to prove that the phenomena explained had necessarily a periodic character. But it may be possible to link together into a picture of a certain wave movement some of the regularities to which they have referred. We think here in particular of the studies by Cassel and Warren and Pearson, on the one hand, and by various others, in particular Wagemann, on the other. Cassel has seen an explanation for the movement of prices in fluctuations of the monetary gold stocks of the world. According to his findings, the latter increased much more rapidly than the general rate of increase of production (which he assumes at about 3 per cent) during certain decades, e.g., between 1850 and 1873 and between 1895 and 1920; in other periods, however, such as between 1873 and 1895 and after 1920, the rate of increase in the gold stock was less than that of production. On the basis of the quantity theory we would, therefore, expect prices to rise in the former and to fall in the latter period, as in fact they did. Cassel does not, however, give any reasons why the increase of the gold stock should show alternatively periods of more rapid and less rapid growth. In part this is no doubt due to chance. The rate of increase of gold stocks has been greatly affected by the discoveries of new gold fields, such as those of Australia and California in the 1850's and those of South Africa around the beginning of the twentieth century. Cassel's arguments have been criticized by many, in particular on the ground that the influence of gold stocks on prices is quite limited, on the one hand, because silver played an important monetary role, especially in earlier days, and, on the other hand, because the money supply consists to a large and increasing extent of banknotes and deposits, the creation of which is only in part and indirectly determined by gold stocks. This has led Professors Warren and Pearson to make additional studies in this field which have led them to the conclusion that Cassel's proposition should on the whole be accepted.[1] They found that there was a satisfactory parallel movement between fluctuations in the gold stock, in the total money supply, and in the price level.

A further contribution to the explanation of fluctuations in gold stocks has been made by the authors who have pointed to the systematic factors affecting the production of gold that operate in addition to the accidental findings of new gold fields. Wagemann has provided impressive statistical data showing that gold production has a tendency to be high when the general level of prices is low and low when the general level of prices is high. This is due to the fact that the cost of gold production fluctuates with the general price level, whereas the yield of this production has a constant value, except for incidental changes in the gold par value of currencies. It might be possible to explain the long waves by a combination of these two theories. When prices are low, gold production would be high. This would

1. G. F. Warren and F. A. Pearson, *Gold and Prices* (New York: Wiley, 1935).

lead to a relatively rapid increase of the gold stock and hence to an increase of prices. As prices reach a higher level, gold production will tend to level off. This would lower the rate of increase of the gold stock, leading to a reduction in the rate of increase of prices which would finally turn into a decline. This in turn would, after a certain time, lead to a new starting point of low prices.

Mathematical analysis of these propositions would indicate that they are correct only if the intensity of the reactions and the lags involved satisfy certain numerical conditions. Research with respect to these points has not yet led to definitive results.

OTHER THEORIES

Another attempt to explain the long waves has been provided by the Dutch economist S. de Wolff.[2] He considers these waves as a particular case of the "echo principle" to which we shall refer in more detail below. In brief, the echo principle amounts to this. If at any time, by whatever cause, there has been a period of active production of a certain type of durable capital goods, this high production will repeat itself after a certain period equal to the lifetime of the particular category of capital goods. According to figures given by De Wolff, the average lifetime of certain categories of very durable capital goods would approximate forty years. On this basis he argues that the long waves reflect the echo principle for these categories of capital goods. He considers these waves, therefore, as reinvestment waves of capital goods with a long lifetime.

Professor Wagemann has made some suggestions for an explanation of the long waves on a sociological basis. He attributes great importance to the ideas, put forward by certain writers in the field of sociology, that each generation has a mentality which is different from that of the preceding one. Wagemann sees periods in which the expansive, bellicose, and wasteful mentality dominates and others in which the conservative and parsimonious mentality dominates. Since the generations succeed each other with intervals of approximately thirty years, one might expect waves with a period of some sixty years. A much

2. *Het economisch Getij* (Amsterdam: Emmering, 1929).

more detailed statistical and factual study would be necessary before any great weight could be attributed to this explanation.

As we have mentioned, many observers question the very fact that there are any long waves and would be satisfied with an explanation of the price fall between 1873 and 1895, the subsequent price rise until 1920, and the fall of prices between 1920 and 1933. They make use, on the one hand, of Cassel's explanation and, on the other hand, of the occurrences in the field of agriculture. Between 1873 and 1895 and also after 1920 agriculture was afflicted by a long-drawn-out expression. In the former period this depression was due in part to the opening-up of the overseas grain-producing areas made possible by the new developments in transportation, particularly in ocean transportation. With respect to the period after 1920, reference is made to the consequences of World War I which again stimulated agricultural production in the overseas territories and to the mechanization of agriculture. After the resumption of agricultural production in Europe, total productive capacity was too large for world demand. Since the demand for most agricultural products is very inelastic, in particular for bread grains and potatoes, which satisfy the most elementary needs, a relatively small excess capacity might be sufficient to create a very severe fall in prices.

The period between 1895 and 1920, on the other hand, is considered as the period during which the rapidly increasing world population and its increasing demand outran the productive capacity of the agricultural resources of that time and during which the law of decreasing returns made itself felt. The higher prices of that period were, according to this line of thought, a necessary condition for the required increase in agricultural production.

As far as we know, no satisfactory comparison or synthesis of these different points of views has been achieved. The question of the long waves remains, therefore, one of the fields in which scientific energy may obtain some rich fruit.