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The Theory of the Long Cycle: Kondratiev, Trotsky, Mandel

At the mention of long cycles, most economists will recall Joseph Schumpeter's classic study, *Business Cycles*. In that work Schumpeter referred to cyclical movements of approximately fifty years in length as 'Kondratievs', after the Russian economist N. D. Kondratiev, who was one of the first writers to attempt to provide statistical evidence of such phenomena. In recent years Kondratiev's name has appeared with increasing frequency not only in business journals, but also in the writings of Ernest Mandel. In his new book, *Late Capitalism*, Mandel has made a systematic effort to reconcile Kondratiev's conclusions with the Marxist tradition in general, and with the views of Leon Trotsky in particular.¹ The present article will therefore explore some of the more important differences which emerged in various encounters between Trotsky and Kondratiev, and then assess the problems which inhere in Mandel's endeavour.

Kondratiev's first reference to long cycles occurred in his book *The World Economy and its Conjunctures During and After the War* (1922). For the most part the

book was concerned with an empirical analysis of events since 1914, rather than with explicitly theoretical questions. The concept of long cycles was introduced only in the last chapter, and then in the form of a somewhat tentative historical generalization. At various places in the book, however, Kondratiev commented upon the nature of capitalism's 'equilibrium'. While it might at first seem paradoxical, the problem of how to interpret capitalism's equilibrium later played a critical role in the debate with Trotsky over how to interpret the system's dynamics.

The economic crisis of 1920–21, Kondratiev explained, had resulted from a disruption of equilibrium in the distribution of world markets and productive forces. America and other overseas countries had vastly expanded production during the war, leading to their occupation of Europe's former export markets. By early 1920, Europe's initial recovery led to an effort to regain these markets and thereby to restore the world economy on the basis of its pre-war, but now obsolescent equilibrium. The result was the international crisis which began in mid-1920. Kondratiev described the relationship between crises and equilibrium in the following manner: 'In its most general form the essence of an economic crisis lies in the fact that the national economies of separate countries and the world economy as a whole, taken as a moving system of elements, loses its equilibrium and experiences an acute, painful process of transition to the condition of a new moving equilibrium. From the economic point of view a crisis is always only an acute and painful process of liquidating the disparities which have arisen in the structure of a national economy, and which destroy the equilibrium of its elements. [A crisis] is the process of establishing a new equilibrium among these elements in place of the one which has broken down.'²

Contrary to many Bolsheviks, Kondratiev argued that the crisis of 1920–21 was neither unique nor exceptional.³ Its historical function was not to herald the imminent collapse of capitalism, but to facilitate the restoration of equilibrium. The concept of long cycles was invoked in order to put the problem into its proper perspective and thus to substantiate this conclusion. Since 1789, Kondratiev declared, capitalism had experienced two complete long cycles of approximately fifty years. The years 1789 to 1809 had witnessed a long wave of expansion, followed by a long wave of relative stagnation from 1809 to 1849. These two waves, together, constituted the first cycle. In 1849 a new cycle began with an expanding wave which lasted until 1873, and which was then followed by a declining wave until 1896. The expanding wave of the third cycle then lasted from 1896 until 1920.⁴ The particularly acute nature of the post-war crisis was thus explained by the fact that it marked a turning point in the third long cycle and the beginning of its declining wave. In the coming years, Kondratiev predicted, depressions would be protracted and recoveries brief, giving the long wave its stagnant tone. Nevertheless, the pending wave of relative stagnation did not contradict the fact that capitalism was re-establishing its moving

¹ Ernest Mandel, *Late Capitalism*, NLB, London 1975.

² N. D. Kondratiev, *Mirovoe khozyaistvo i ego kon'yunktury vo vremya i posle voiny*, Vologda 1922, p. 191; cf. pp. 199, 204, 208.

³ Ibid. p. 209; cf. pp. 192, 214.

⁴ Ibid. p. 242.

equilibrium. The effect of the 1920–21 crisis would be ‘a decisive weakening of the discrepancies in the system of elements which makes up the world economy’.⁵

Leon Trotsky dealt with essentially the same questions a year before the publication of Kondratiev’s manuscript, in a speech to the third congress of the Communist International. Like Kondratiev, Trotsky believed that to analyse capitalism’s crises one must first understand its equilibrium. His treatment of the subject was in many ways similar to Kondratiev’s: ‘Capitalist equilibrium is an extremely complex phenomenon. Capitalism produces this equilibrium, disrupts it, restores it anew in order to disrupt it anew, concurrently extending the limits of its domination. In the economic sphere these constant disruptions and restorations of the equilibrium take the shape of crises and booms. . . . Capitalism thus possesses a dynamic equilibrium, one which is always in the process of either disruption or restoration.’⁶

The similarity did not end there. Trotsky too disagreed with those Comintern members who were eagerly awaiting capitalism’s collapse. He argued that the return of crises itself was evidence that ‘capitalism is not yet dead’.⁷ In order to assess future prospects, Trotsky likewise believed that current events must be put into perspective. For this purpose he referred to a graph of English foreign trade which had recently appeared in *The Times*. He described the graph as follows: ‘In January of this year the London *Times* published a table covering a period of 138 years. . . . In this interval there have been 16 cycles, i.e., 16 crises and 16 phases of prosperity. Each cycle covers approximately $8\frac{2}{3}$, almost 9 years. . . . If we analyze the curve of development more closely, we shall find that it falls into five segments, five different and distinct periods. From 1781 to 1851 the development is very slow; there is scarcely any movement observable. . . . After the revolution of 1848, which acted to extend the framework of the European market, there comes a breaking point. From 1851 to 1873 the curve of development rises steeply. . . . Then from 1873 on there follows an epoch of depression. From 1873 until approximately 1894 we notice stagnation in English trade. . . . Then comes another boom, lasting until the year 1913. . . . Then, finally, with the year 1914, the fifth period begins—the period of the destruction of capitalist economy.’⁸ As the above excerpts indicate, Trotsky and Kondratiev appeared to agree on the concept of equilibrium; and Trotsky’s time periods also corresponded generally with Kondratiev’s outline of long cycles. Obscured by these similarities, however, were fundamental differences, the only sign of which, at this point in time, could be detected in Trotsky’s reference to historical ‘periods’ as compared with Kondratiev’s ‘cycles’. The full significance of these terms would subsequently become clear.

Only with respect to one critical point were Trotsky and Kondratiev already in total disagreement. Whereas Kondratiev reasoned that the

⁵ Ibid. p. 254.

⁶ Leon Trotsky, *The First Five Years of the Communist International*, New York 1945, Vol. I, p. 174.

⁷ Ibid. p. 200.

⁸ Ibid. p. 201.

crisis of 1920–21 indicated the approaching restoration of capitalism's equilibrium, Trotsky denied that such was the case. Within the separate national economies of Europe he saw continuing disequilibrium between town and country and between the various branches of industry.⁹ In the world economy an even more profound disequilibrium was apparent in Europe's relationship with America. America's export competition was menacing Europe's recovery. And the American economy was itself in jeopardy 'because Europe is impoverished and can no longer buy American goods'.¹⁰ The necessary consequence would be 'a period of prolonged and profound depression'.¹¹ Future crises would curtail American production while simultaneously levelling out the economies of Europe 'in reverse'. '... In the epoch which we have entered', Trotsky asserted, '... up-swings can only be of a superficial and primarily speculative character, while the crises become more and more prolonged and deeper-going'.¹² Theoretically capitalism's equilibrium might eventually be restored—after two or three decades—but only at a horrible price: Europe would be 'thrown violently into reverse gear' and millions of workers would 'die from unemployment and malnutrition'.¹³

In December 1921 Trotsky published an article entitled 'Flood-Tide', which provided an additional hint regarding his future debate with Kondratiev. As in his discussion of the English foreign trade graph, he was again concerned with two basic phenomena: the regular fluctuations of the classical business cycle, lasting eight to ten years, and the 'uneven upward curvature' of the underlying trend of development. Referring to the latter as the 'basic curve' of capitalist development, Trotsky observed: 'There are decades when it rises only by a hair's breadth, then follow decades when it swings steeply upward, only in order later, during a new epoch, to remain for a long time on one and the same level.' The periodic fluctuations of the classical cycle, he suggested, 'might be compared to the vibrations of ... a string of wire under tension'. But this analogy was unsatisfactory in that the basic curve or line of development, unlike a string of wire, 'is not straight'.¹⁴ A better analogy might compare capitalism's cycles with the heartbeat of a living organism. When the organism is healthy its heartbeat is regular. The senility of post-war capitalism, in these terms, could be detected in the transformation of regular cycles into convulsive 'spasms' of the kind experienced in 1920–21.¹⁵

In November 1922 Trotsky spoke to the fourth congress of the Communist International on the same theme, stressing the need for further study of the relationship between capitalism's 'basic curve' and its 'cyclical curve'. 'The correlation of the two curves', he pointed out, 'has not been elucidated up to now in Marxist literature—nor to my knowledge in general economic literature. Yet the question is of the utmost importance both theoretically and politically'.¹⁶ These remarks indicate

⁹ Ibid. p. 180.

¹⁰ Ibid. p. 196.

¹¹ Ibid. p. 206.

¹² Ibid. p. 208.

¹³ Ibid. p. 211.

¹⁴ Trotsky, op. cit. Vol. II, pp. 80–1.

¹⁵ Ibid. p. 84.

¹⁶ Ibid. p. 258.

that up to this time Trotsky was still not familiar with Kondratiev's book. *The World Economy and its Conjunctures* had in fact explored precisely this question. By his use of the term 'long cycles', Kondratiev had implicitly hypothesized that the basic trend of capitalist development could be represented either by a straight line, or by a smooth curve, against which long cycles might be measured. In other words, the long-run moving equilibrium of capitalism was assumed to move in accordance with a single equation, whereas Trotsky's concept of uneven development implied a trend broken into discontinuous periods, each represented by a distinct line with a different slope. By June 1923 Trotsky had studied Kondratiev's work. His response was instantly critical.

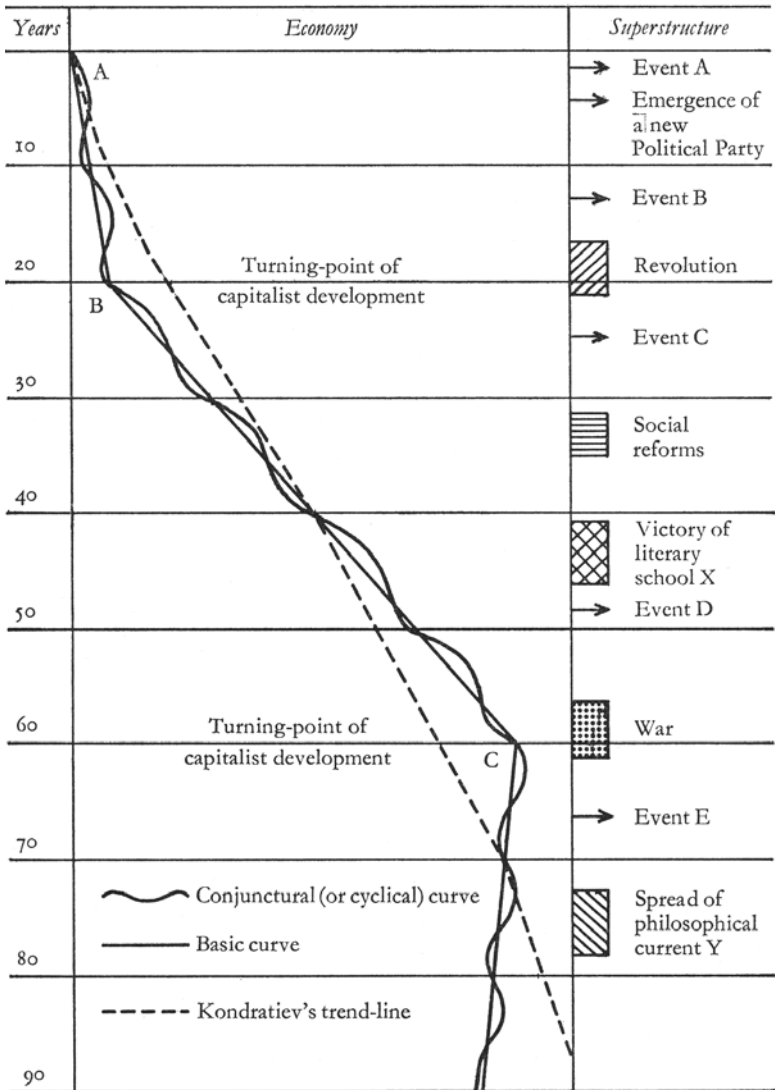
In his article 'On the Curve of Capitalist Development', Trotsky challenged Kondratiev's assumptions by presenting a stylized diagram of capitalist economic growth based upon the graph of English foreign trade (Diagram 1). As the diagram indicates, Trotsky saw capitalism's 'moving equilibrium' being periodically interrupted at clearly defined turning-points which altered its slope. Kondratiev's methodology differed in that he assumed a trend-line similar to that which we have superimposed upon Trotsky's diagram. He was therefore led to conclude that the short-run oscillations, when statistically smoothed, would yield the pattern of long cycles. At a later juncture Kondratiev would publish his own graphs, making this reasoning more explicit.

Trotsky rejected the concept of long cycles on the grounds that Kondratiev had obscured the difference between periodical cycles and separate historical periods. Marx had succeeded in discerning regularity in the pattern of short cycles because these were the consequence of the internal contradictions of capitalism. Before one could speak of regular long cycles, however, one had first to posit the existence of an *internal regulator*. But as Trotsky sought to demonstrate in his diagram, the turning-points of capitalist development were regulated by *external conditions* and by the relative autonomy of superstructural phenomena. The turning-points were, therefore, unpredictable in character and no automatic periodicity was possible. As Trotsky wrote: 'One can reject in advance the attempts by Professor Kondratiev to assign to the epochs which he calls long cycles, the same "strict rhythm" which is observed in short cycles. This attempt is a clearly mistaken generalization on the basis of a formal analogy. The periodicity of short cycles is conditioned by the internal dynamic of capitalist forces, which manifests itself whenever and wherever there is a market. As for those long (50 year) intervals of the capitalist curve, which Professor Kondratiev hastily proposes also to call cycles, their character and duration is determined not by the internal play of capitalist forces, but by the external conditions in which capitalist development occurs. The absorption by capitalism of new countries and continents, the discovery of new natural resources, and, in addition, significant factors of a "superstructural" order, such as wars and revolutions, determine the character and alteration of expansive, stagnating or declining epochs in capitalist development.'¹⁷

¹⁷ Trotsky, 'O krivoi kapitalisticheskovo razvitiya', in *Vestnik Sotsialisticheskoi Akademii*, No. 4, April–July 1923, p. 9.

DIAGRAM I

The Curve of Capitalist Development



SOURCE: L. D. Trotsky, 'O krivoi kapitalisticheskovo razvitya', in *Vestnik Sotsialisticheskoi Akademii*, No. 4, April-July 1923.

Explanatory note. Trotsky refers to the above diagram as an 'arbitrarily constructed' drawing, or a 'schematic drawing'. However, Trotsky was too careful a thinker to allow legerdemain any part in his writing. Instead, my judgment is that the drawing originated with the foreign trade data to which Trotsky referred in 1921. That this was in fact the case is shown in Diagram 3 (below), where I superimpose Trotsky's 'basic curve' upon Kondratiev's empirical line. The result is a reasonable fit between the two lines if allowance is made for differences in the length of the first and third segment of the 'basic curve'. The drawing therefore represents reality in the general sense that its origin is factual; it is 'schematic', or hypothetical, in the sense that the 'conjunctural (or cyclical) curve' simplifies the data represented by Kondratiev's empirical line. Likewise the superstructural events (A, B, C, D, E) do not refer to specific real events, but to any events of such magnitude as to affect the course of capitalist development, events such as the revolutions of 1848 or the

Russian revolution of 1905. The reader should notice, however, that the important point is not the exactness of the fit between the two drawings, but the fact that the structure of Trotsky's 'basic curve' is so radically different from Kondratiev's single equation trend-line. It is this fact which underlines Trotsky's disagreement with Kondratiev's belief that capitalism's 'moving equilibrium' could be portrayed as an unbroken line against which 'long cycles' might be measured.

The next major development in the debate over long cycles came in 1925, with the publication of Kondratiev's essay dealing with 'The Long Cycles of the Conjuncture'. In this essay, and in an oral report to a professional audience in February 1926, Kondratiev discussed the tentative conclusions he had reached in 1922. To demonstrate his findings he used several graphs dealing with both real and monetary data. His method, he explained, had been to eliminate the effects of population growth where necessary, and then to plot the empirical data. By means of the least-squares technique, a trend-line was then determined for each series, from which the deviations of the empirical data were measured and plotted horizontally. Short-term cyclical influences were then removed using a nine-year moving average, producing a third graph which portrayed the movements of the long cycle about the trend line. In the case of the English foreign-trade data his results were as follows (Diagram 2).

In light of these more detailed statistics, Kondratiev now revised his earlier estimates of the turning-points of the long waves. Their pattern, he suggested, had been the following:

1790	to 1810-17	rising wave	} first long cycle
1810-17	to 1844-51	falling wave	
1844-51	to 1870-5	rising wave	} second long cycle
1870-5	to 1890-6	falling wave	
1890-6	to 1914-20	rising wave.	

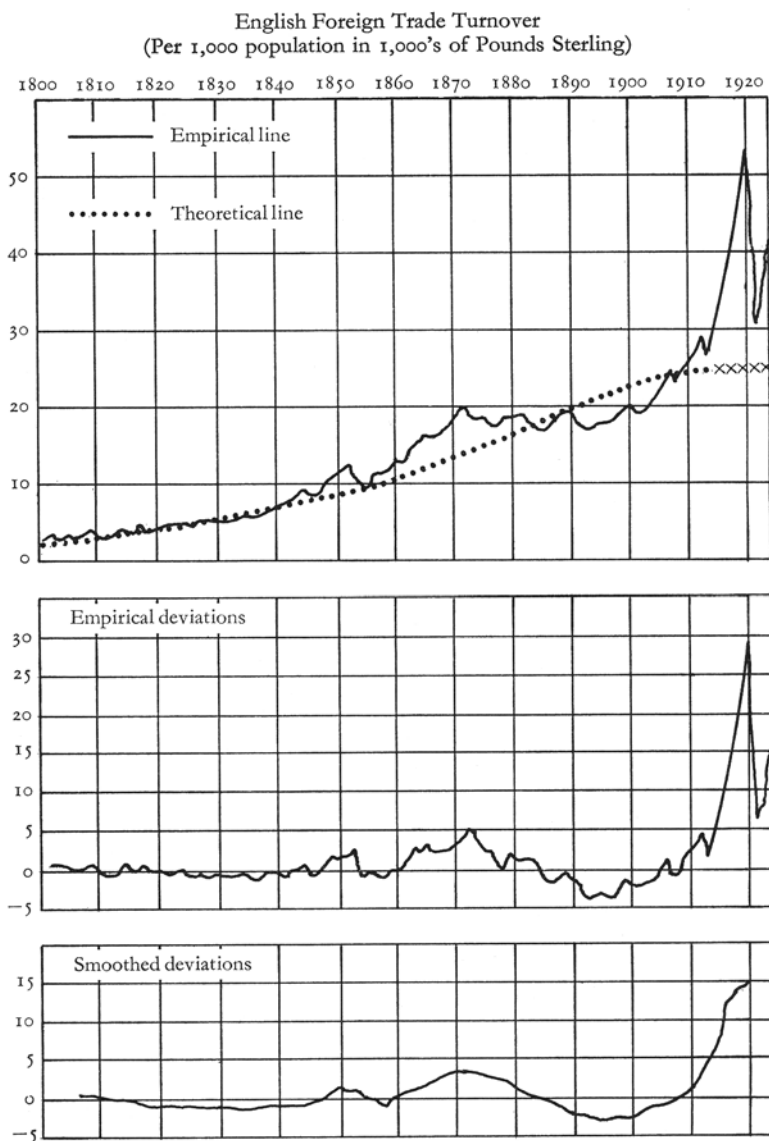
The occasional arbitrariness in Kondratiev's selection of turning-points, as well as certain other questionable practices in his use of statistics, were commented upon at length by several of his contemporaries and have been summarized by George Garvy's article in *The Review of Economic Statistics*.¹⁸ For that reason they need not detain us here. More important are the differences between his approach and Trotsky's. These can be most readily perceived if we now superimpose upon Kondratiev's first graph Trotsky's stylized sketch of capitalist development. Since this sketch was also drawn from foreign trade data, Trotsky's segmented line fits quite adequately with Kondratiev's graph. To make the comparison more complete, we have here added the missing fourth segment to Trotsky's line (Diagram 3). In this way we have portrayed all of the four periods which Trotsky discussed in 1921, the fifth period being that of the destruction of capitalism, which was about to begin.

Diagram 3 clarifies the methodological differences between Trotsky and

¹⁸ George Garvy, 'Kondratiev's Theory of Long Cycles', in *The Review of Economic Statistics*, Vol. XXV, No. 4, November 1943, pp. 203-20.

Kondratiev, making it necessary now to explore more thoroughly the assumptions implicit in the two approaches. The major point to notice in this regard is that Kondratiev treated Trotsky's 'external conditions' as passive manifestations of the long cycle itself, rather than as shocks to the capitalist system emanating from without (in either a conceptual or geographical sense). According to Kondratiev, there were several 'regularities', or generally predictable characteristics of a long cycle's movement. He explained that 1. technological innovations, extensions of the world market and changes in the money supply regularly occur

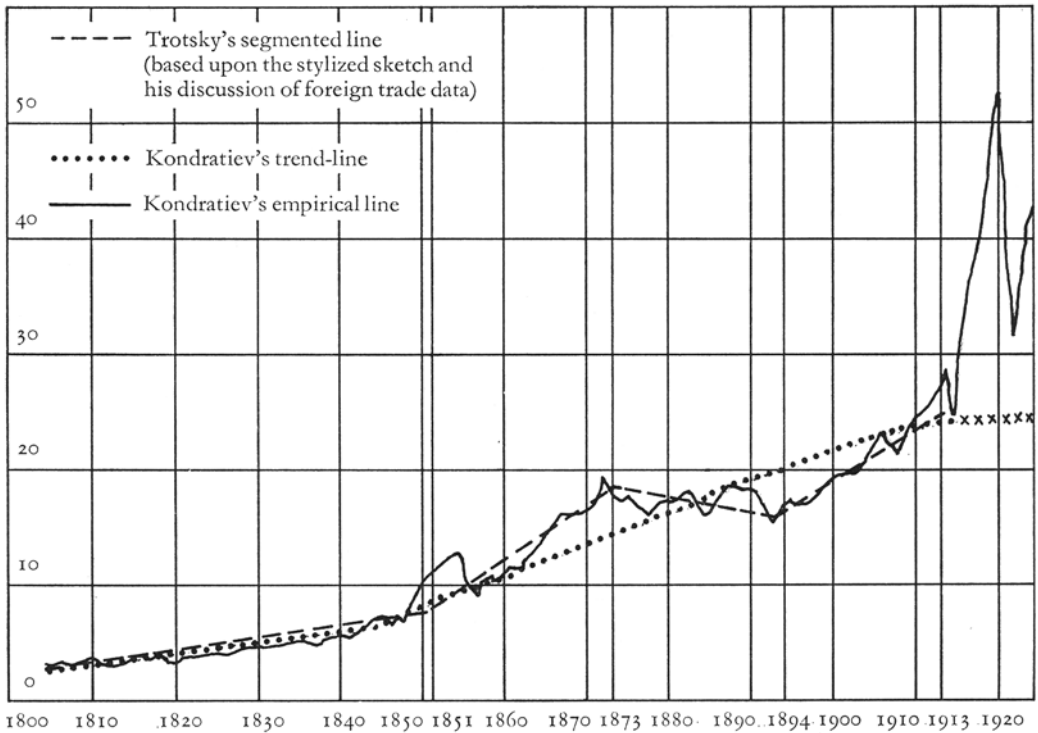
DIAGRAM 2



SOURCE: N. D. Kondratiev & D. I. Oparin, *Bol'shie tsikly kon'yunktury*, Moscow 1928, p. 27.

DIAGRAM 3

Trotsky's 'Curve of Capitalist Development' Superimposed upon Kondratiev's Graph



either before the upswing of a long cycle or in its early stages;¹⁹ 2. wars, revolutions and other social transformations occur during rising waves;²⁰ 3. declining waves are accompanied by severe agricultural depressions;²¹ and 4. the long cycle affects the pattern of the short cycle by determining the balance between depressions and recoveries.²²

To demonstrate that no distinction could be drawn between capitalism's 'internal dynamic' and its 'external conditions', Kondratiev elaborated further. Technological discoveries, he asserted, were linked to the declining wave of the long cycle and presupposed a rising wave before they could enter the productive process on a large scale.²³ Wars were the result of a rising wave of growth leading to an intensified struggle for markets.²⁴ Revolutions were caused by the conflict between expanding capitalism and the traditional legal-social order of society.²⁵ New countries were drawn into the world economy not by accident, but when they became necessary as markets and sources of materials.²⁶ Gold production similarly was conditioned by the oscillating pattern of long waves.²⁷

¹⁹ Kondratiev, 'Bol'shie tsikly kon'yunktury', in *Voprosy Kon'yunktury*, ed. Kondratiev, Moscow 1925, pp. 47–53.

²⁰ Ibid. p. 54.

²¹ Ibid. p. 55.

²² Ibid. p. 57.

²³ Ibid. p. 60.

²⁴ Ibid. p. 61.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid. pp. 61–5.

As for the 'strict rhythm' of the movements he was considering, Kondratiev conceded that his research to date might not substantiate a fully cyclical pattern. He insisted, however, that such a pattern was 'most probable'.²⁸ The duration of short cycles varied between 7 and 11 years, or by 57 per cent; that of long cycles varied between 48 and 60 years, or by only 25 per cent.²⁹ It followed that the long cycles were generally rhythmical. Moreover, they possessed that rhythm precisely because they were not subject to the external shocks which Trotsky had posited. These alleged shocks were themselves only expressions of the long waves and were statistically represented by their movement. In Kondratiev's analysis, the basic pattern of capitalism was its cyclical fluctuations, both long and short. But to study the long fluctuations it was clearly necessary to differentiate between cause and effect, to focus upon the reality of the cycle and not upon its consequences. This could only be done by plotting the deviations of the empirical data from a trend-line. The trend-line itself could not be segmented. Nor was there any theoretical justification for doing so, inasmuch as capitalism was capitalism, whatever the period in question, and was characterized by an essentially unchanging dynamic. The single trend-line represented the long-term moving equilibrium of the capitalist system. The addition of new data to the time series might result in a new trend-line, with a better 'fit', but to be consistent with Kondratiev's reasoning that line too would be governed by a single equation. In brief, Kondratiev's method was based upon his theory of equilibrium, as expounded in *The World Economy and its Conjunctures*, and his internalization of Trotsky's 'external conditions'.

In his oral report of February 1926, Kondratiev went beyond a descriptive analysis of long cycles and endeavoured to explain their causes. He began by dealing with capitalism's constant tendency towards equilibrium, which he now defined in terms of three 'orders'. The first order was based upon relatively fixed supply and demand; the second resulted when, on the basis of existing capital equipment, volumes of production expanded or contracted; and the third order involved changes in the capital stock.³⁰ The long cycles represented deviations from the long-term moving equilibrium, these deviations being related to the reproduction of the most durable and costly forms of fixed capital. In Kondratiev's words: '[Just as] Marx asserted that the material basis of crises, or of average cycles, repeating themselves each decade, is the material wearing out, replacement and expansion of the mass of means of production in the form of machines lasting an average of ten years, . . . it can be suggested that the material basis of long cycles is the wearing out, replacement and expansion of fixed capital goods which require a long period of time and enormous expenditures to produce. The replacement and expansion of these goods does not proceed smoothly, but in spurts, another expression of which are the long waves of the conjuncture. . . . Thus the long cycles of the conjuncture constitute the processes of the deviation of the real level of the elements of the capital-

²⁸ Ibid.; cf. p. 59.

²⁹ Ibid. p. 59.

³⁰ N. D. Kondratiev & D. I. Oparin, *Boʻshie tsikly konʻyunktury*, Moscow 1928, pp. 58–9.

ist system from the equilibrium level (of the third order, or higher) of this system; processes, in the course of which the level of equilibrium itself changes.’³¹

The forms of investment which Kondratiev had in mind included canals, railways, buildings and the periodical technological renovations of industry which attend the rising wave of a long cycle. The implication of this argument was that the long cycle was no less regulated by the ‘internal dynamic’ of capitalism than the short cycle. A rising wave presupposed a lengthy period of saving in excess of fixed capital formation, ultimate concentration of these savings in the hands of investors, and profit opportunities sufficiently attractive to induce a new wave of investment.³² The new investment wave would ultimately contribute to political and social instability; and this fact, together with a gradual depletion of loanable funds, would cause the interest rate to rise.³³ Investment would then be curtailed, a declining wave would ensue, and the incentive to discover cost-cutting innovations would be restored.

But major technological discoveries would not enter into production until a new round of massive capital accumulation had occurred. As the general price index drifted downwards during the declining wave, savings would be accumulated by those on fixed incomes. The more acute depression in agriculture, where production was less responsive to price changes than in industry, would alter the terms of trade between the rural and urban sectors and accelerate saving activity in the latter. In addition, the weakening of the general price index would promote expanded gold production as the purchasing power of gold in terms of other commodities rose. In this way too the supply of loanable funds would grow. The aggregate consequence of all these changes would be a decline in the interest rate, renewing the incentive to invest.³⁴ Such was Kondratiev’s brief outline of the mechanics of the long cycle. This was, he cautioned, only a first attempt at theoretical explanation. Nevertheless, he was content that he had given ‘a sufficiently complete and satisfactory explanation’.³⁵

Needless to say, his many critics were less satisfied. One of these was Trotsky. On 18 January 1926 Trotsky participated in a discussion on the world economy, attended by several of Russia’s best-known authorities on the subject, including Kondratiev. The main theme of Trotsky’s contribution, as in 1921, was the prevailing disequilibrium in world affairs. Europe, he affirmed, was continuing to experience spasmodic convulsions in place of a regular cycle.³⁶ ‘... When a living organism finds itself in impossible circumstances’, Trotsky had written a few months earlier, ‘its heart beats irregularly. ... This is what we

³¹ Ibid. pp. 60–1.

³² Ibid. pp. 62–3.

³³ Ibid. pp. 63–4.

³⁴ Ibid. pp. 64–5.

³⁵ Ibid. p. 68.

³⁶ Trotsky, ‘K voprosu o tendentsiyakh razvitiya mirovovo khozyaistva’, in *Planovoe Khozyaistvo*, No. 1, January 1926, pp. 186–7.

have been witnessing in Europe.’³⁷ The Ruhr experience had demonstrated that superstructural events were hindering the ‘free or semi-free play of economic forces’.³⁸ Should America continue to flourish at Europe’s expense, Trotsky indicated that superstructural factors would grow in importance: Europe would face a revolutionary perspective.³⁹ Conversely, if the American economy did not grow, American militarism would.⁴⁰

Turning to more theoretical questions, Trotsky repeated his belief that Kondratiev’s ‘waves’ were simply the reflections of ‘external conditions’. The long cycles did not ‘grow out of the internal dynamics of the capitalist process as such, but out of the conditions in which it finds itself . . . ; out of the opening up of new continents, colonies and markets for capitalist activity, or out of the military [and] revolutionary shocks which cross its path’.⁴¹ The simultaneous decline of Europe and expansion of American proved that Kondratiev’s ‘cycle’ did not apply uniformly to the world economy. Nor could it do so, for individual countries were each regulated by their own internal contradictions, thus accounting for the uneven development of the world economy as a whole. ‘. . . If one attempts [to establish a long cycle] for each separate country’, Trotsky argued, ‘the whole thing crumbles into dust. Marx’s cycle, meanwhile, can be confirmed on the whole for each separate country . . .’.⁴²

The transcript of Kondratiev’s remarks to the meeting of 18 January is not available to this writer. In light of other sources, however, it is possible to imagine how he might have responded to Trotsky. During the February 1926 debates, V. E. Bogdanov raised one of the same issues as Trotsky, declaring that the expansion of the world market was in part an unpredictable external condition of capitalist development. On this occasion, Kondratiev replied with the charge that Bogdanov was retreating to idealism: ‘Matters are not such that some unknown new markets are sought. . . the United States, Australia, Canada and so on had long been known, but they were drawn into [the world commodity turnover] at a definite time and in definite circumstances. And why did it happen this way? What were the circumstances? Clearly it was not by accident, but in face of the existing economic preconditions [i.e. an expanding wave of the long cycle]. Comrade Bogdanov did not think to analyse these preconditions and did not notice that while maintaining a materialist terminology, together with Trotsky he takes an idealist point of view.’⁴³

In April 1926, N. Sukhanov repeated another of Trotsky’s charges, claiming that Kondratiev had ignored the different stages of capitalism. According to Sukhanov, Kondratiev studied economics in the same

³⁷ Trotsky, ‘Rech’ t. L. D. Trotskovo’, in *Planovoe Khozyaistvo*, No. 6, June 1925 p. 176.

³⁸ Trotsky, ‘K voprosu o tendentsiyakh . . .’, p. 188.

³⁹ Ibid. p. 195.

⁴⁰ Ibid. pp. 195–6.

⁴¹ Ibid. p. 190.

⁴² Ibid.

⁴³ Kondratiev & Oparin, op. cit. p. 213.

way as an astronomer might investigate the immutable orbits of heavenly bodies.⁴⁴ A more rational approach would take into account capitalism's youth, maturity, decrepitude—and even the likelihood of death. Borrowing Trotsky's analogy of the pulse beat, Sukhanov exclaimed that capitalism had lost its creative force and become senile. By ignoring the successive stages of capitalism, Kondratiev had built his theory on a foundation which Sukhanov considered 'no thicker than a cobweb'.⁴⁵ In his reply, Kondratiev defended the use of a continuous trend-line by arguing that capitalism is capitalism, and that its dynamic is basically constant: 'Crossing through different stages, capitalism remains capitalism and maintains its basic features and regularities. Otherwise how could these stages be stages of capitalism? The law of value and prices, the tendencies of the norm of profit and production, the waverings of the conjuncture and crises might manifest themselves with one distinction or another at different stages, but I am not aware that Marxism or any other trend in economics has asserted that the law of value and prices, or the law of profits and of conjunctural fluctuations is *absolutely different* at diverse stages of capitalist development so as to preclude generalizations. Likewise, I am not aware of any physiology which asserts that the laws of the blood's circulation and of respiration are *absolutely different* at the different ages of an organism, and do not admit of generalizations.'⁴⁶

Throughout the remainder of the twenties, the literature on long cycles continued to proliferate in the Soviet Union. Finally, in 1930 Kondratiev suffered the fate of all who dared to think freely in Stalin's day. He was arrested, forced to perform as a 'witness' in a fake trial, and ultimately died in unknown circumstances. As the irony of history would have it, however, today Kondratiev is being partially 'rehabilitated'—not by Stalin's heirs, but by an heir of Leon Trotsky. In *Late Capitalism* and numerous shorter articles, Ernest Mandel has explored the contours of the Kondratiev debate to ascertain what light the theory of long cycles might cast on the history of modern capitalism. In this enterprise he has considered not only Kondratiev's treatment of long cycles, but the related efforts of several other writers as well. In particular he has examined the works of Trotsky. But in his research Mandel appears to have devoted insufficient attention to the early chapters of Kondratiev's *World Economy and its Conjunctures*. The oversight is comprehensible, in that Kondratiev only dealt with long cycles in the concluding pages. The consequence, however, is that Mandel breaks into the debate at its mid-point and misses the significance of Kondratiev's theory of equilibrium.

This weakness can be demonstrated by reference to Mandel's interpretation of Trotsky's article 'On the Curve of Capitalist Development'. Here, the reader will recall, Trotsky first produced his segmented trend-line and emphasized the 'external' determinants of economic activity. Mandel does not see that the purpose of Trotsky's diagram was to

⁴⁴ N. Sukhanov, 'Bol'shie tsikly kon'yunktury', in *Planovoe Khozyaistvo*, No. 4, April 1926, p. 161.

⁴⁵ Ibid. p. 164.

⁴⁶ Kondratiev, 'K voprosu o bol'shikh tsiklakh kon'yunktury', in *Planovoe Khozyaistvo*, No. 8, August 1926, p. 171.

challenge Kondratiev's concept of equilibrium. Instead, he infers that Trotsky was pointing to the need to supplement purely economic data with an investigation of related social and political developments.⁴⁷ There is no doubt that Trotsky did underline the relation between such developments and the empirical data. But it is the precise nature of that relation which Mandel fails to grasp. In his article and his diagram, Trotsky sought to demonstrate that 'external conditions' and the relative autonomy of 'superstructural' phenomena precluded any automatic periodicity of long cycles. Indeed, in his sketch of a segmented trend-line Trotsky challenged the entire methodology upon which Kondratiev's detection and measurement of long cycles depended. The logical consequence was that Trotsky denied the existence of long cycles and referred instead to distinct 'epochs', or historical 'periods', which found diagrammatic expression in the segments of the trend-line.

Mandel's misunderstanding of Trotsky's position can be further illustrated by his reference to George Garvy, who quite properly concluded that Trotsky denied the cyclical character of long-term fluctuations. In *Late Capitalism*, Mandel suggests that Garvy's conclusion was 'not quite accurate'; that is to say, Garvy discovered a mere semantic difficulty which, if pursued, would reduce the question 'to a pointless dispute as to the semantic differences between cycles, "long waves", "long periods", and "large segments of the capitalist curve of development"'.⁴⁸ What Mandel takes to be only a semantic difference in reality constituted the very core of the Trotsky-Kondratiev debate.

Mandel's awkwardness in dealing with these questions must be accounted for by the fact that one of the purposes of *Late Capitalism* is to reinforce Kondratiev's conclusions with more orthodox Marxist explanations. He begins by asking whether there exists 'a peculiar inner dynamic to the succession of industrial cycles over longer periods of time?'⁴⁹ He answers the question in the affirmative, on the grounds that capitalism has experienced 'three general revolutions in technology'.⁵⁰ These have been the 'machine production of steam-driven motors since 1848; machine production of electric and combustion motors since the nineties of the nineteenth century; machine production of electronic and nuclear-powered apparatuses since the forties of the twentieth century'.⁵¹

Each technological revolution is said to have been preceded by an 'over-accumulation' of capital, or 'a situation in which a portion of the accumulated capital can only be invested at an inadequate rate of profit, and increasingly only at a diminishing rate of interest'.⁵² This over-accumulation of capital, although caused by a declining rate of profit in the ways Marx suggested, plays essentially the same role in Mandel's writing as Kondratiev's growth of loanable funds during a declining

⁴⁷ Mandel, *op. cit.* p. 128.

⁴⁸ *Ibid.* p. 129.

⁴⁹ *Ibid.* p. 110.

⁵⁰ *Ibid.* p. 118.

⁵¹ *Ibid.*

⁵² *Ibid.* p. 109.

wave. Once the required capital has been accumulated, each technological revolution has been initiated by a combination of 'triggering factors' which raised the rate of profit, brought the new processes into production, and thus generated a long wave of rising investment and economic activity. 'By exactly the same process, however, the gradual generalization of the new sources of energy and new motive machines must lead . . . to . . . renewed underinvestment and reappearance of idle capital.'⁵³ The rate of profit falls due to a rise in the organic composition of capital and a fall in the rate of surplus-value. A wave of contracting activity ensues. Four such experiences are said to have occurred in the history of capitalism in accordance with the following pattern:

late 18th century to 1823 accelerated growth
1824 to 1847 decelerated growth

1848 to 1873 accelerated growth
1874 to 1893 decelerated growth

1894 to 1913 accelerated growth
1914 to 1939 decelerated growth

1940–5 (or 1940–8, depending upon the country) to 1966 accelerated growth

'According to this scheme', Mandel concludes, '... we should today have entered into the second phase of the "long wave" which began with the Second World War, characterized by decelerated capital accumulation.'⁵⁴

By relating levels of investment and growth rates to the rate of profit, Mandel seeks to avoid the complications inherent in Kondratiev's reliance upon the theory of loanable funds. When describing capitalism after the Second World War, Mandel is particularly careful to analyse the influence of credit creation and monetary management upon profits. Moreover, by concentrating explicitly on the rate of profit, as the key regulator, he also attempts to overcome Trotsky's distinction between the 'internal dynamic' and the 'external conditions'. Thus he arrives at what appears to be a reasonable solution of the problem which Trotsky posed. But the apparent resolution of Trotsky's dilemma does not yet put to rest the question of the long cycle's 'rhythm'. Mandel's description of the 'internal dynamic' of technological revolutions suggests that some degree of rhythm is present; yet he also agrees with Trotsky that social and political factors prevent the long cycles from exhibiting 'natural necessity'.⁵⁵ To surmount this final difficulty he avoids reference to long cycles—implying rhythmic movement—and refers instead to 'long waves with an undertone of expansion' and 'long waves with an undertone of stagnation'.

The problem with this terminology, however, is that it leads directly back to the substance of the Trotsky–Kondratiev debate. In Kondratiev's use of the term 'wave', two waves were understood to comprise a

⁵³ Ibid. p. 119.

⁵⁴ Ibid. p. 122.

⁵⁵ Ibid. p. 129.

cycle. Furthermore, the term 'wave' continues to imply a theoretical norm in relation to which waves might be discerned. Thus, in the final analysis, Mandel comes face to face with the question of capitalism's equilibrium—without realizing that he has done so. He speaks of distinct stages and unevenness in the development of capitalism, as suggested by Trotsky's notion of a discontinuous trend-line. Yet he simultaneously implies by his reference to waves that he agrees with Kondratiev's concept of a smoothly evolving long-term equilibrium. In short, he agrees with both Kondratiev and Trotsky at the same time, something which is logically impossible. Either capitalism develops in accordance with a smooth, evolutionary pattern, in which case one can speak of waves. Or alternatively, the theory of waves only mystifies the uneven development of capitalism, as Trotsky contended. No amount of subtlety can overcome the basic fact that in Trotsky's view long waves—or long cycles—were incompatible with a Marxist periodization of the history of capitalism.