CHAPTER 8

DISCONTINUITY AND CAPITAL THEORY

"Time is a line that eats itself."
Michael Friedman,
1977, First Blood

8.1. The Capital Theory Controversies

We shall not attempt here any final, or even penultimate, resolution of the capital theory controversies that have raged and sputtered with varying degrees of intensity over the last several decades. We are referring here to those labeled "Cambridge controversies," (Harcourt, (1972)) after Cambridge, England and Cambridge, Massachusetts, the respective locations of several of the principal participants. However we shall attempt to explicate the role played by discontinuity in certain aspects of these controversies and perhaps to the continuing lack of any such ultimate resolution of these controversies.

One reason for this lack of resolution has been that these controversies have existed at a variety of levels and about a variety of topics, all circling about the concept of "capital" in one way or another. What really is capital and what does it mean for value, growth, and distribution? Is it a pile of produced means of production? Is it dated labor? Is it waiting? Is it roundaboutness? Is it an accumulated pile of finance? Is it a social relation? Is it an independent source of value? The answers to these questions are probably matters of belief.

Solow (1956a,b, 1957) and Swan (1956) developed a neoclassical growth model with accumulation of aggregate capital as the main source of growth and distribution determined by the relative marginal productivities of aggregate capital and labor. Joan Robinson (1953-54, 1956) argued that the heterogeneity of capital undermined this explanation because the rate of profit must be known before capital can be aggregated into a value.

This argument was given an extra emphasis when Piero Sraffa (1960) discovered the possibility of the reswitching of techniques, that a particular technique might be most profitable at discretely different profit rates with at least one other technique dominating in between. Such a case can occur if in the comparison of
the two alternative techniques in steady-state equilibria one produces higher net per capita output in the near term and in the long term, but not in between, relative to the other technique. This implies that in general there is no monotonic relationship between the rate of profit and the aggregate capital-labor ratio. Thus the rate of profit is not in general an index of the relative scarcity of capital. In particular both Robinson and Sraffa argued that this result fundamentally undermines the marginal productivity theory of distribution as developed by John Bates Clark (1891).

A false effort by Levhari (1965) to disprove the possibility of reswitching for entire economies triggered a cascade of counterexamples in a Symposium (Bruno, et al, 1966). In this Symposium Samuelson declared that, "The foundations of economic theory are built upon quicksand." The aftermath of this exchange was a veritable outburst of controversies, many of which are discussed by Harcourt (1972).

It was realized that the non-monotonic relationship between the aggregate value of capital to labor ratio and the rate of profit, called capital-reversal, was a much broader phenomenon that could occur even when reswitching did not (Harris, 1973). This led many of the (Cambridge, Massachusetts) neoclassical theorists (but not the practicing econometricians) to abandon the concept of aggregate capital, except as a vague "parable." In a neo-Walrasian, Arrow-Debreu, general equilibrium model, heterogeneous capital should be kept heterogeneous, with each specific type earning its own particular marginal product, just like each type of heterogeneous labor or heterogeneous land supposedly does. However some, such as Yeager (1976) and Bigman (1979) used a "neo-Austrian" (or perhaps more precisely neo-Irving Fisherian) line that there is still a meaning to the concept of the "factor of production whose price is the rate of interest" even in a world of paradoxical capital-reversal, where this "factor" does not equal measurable aggregate capital, and thus attempted to refute the alleged "economic nihilism" of Cambridge, England.

This apparent "economic nihilism" also extended to the Left against the fundamentalist version of the Marxian labor theory of value. It was Garegnani (1970) who noted that the simple neoclassical parable holds under the condition that all capital-labor ratios are identical in all sectors, the condition sufficient to provide a simple resolution of the Marxian "transformation problem" between labor values and cost-of-production prices. Using the Robinson-Sraffa approach Steedman (1977) systematically critiqued the orthodox Marxian labor theory of value while still calling for a broadly Marxist approach to economic theory. This aspect of the Cambridge, England, "neo-Ricardian" view has been sharply criticized by more orthodox neo-Marxians who have denounced such analysis as "vulgar," "unhistorical," and "commodity fetishism" (Rowthorn, 1973; Roosevelt, 1975; Shaikh, 1982).

A mainstream Cambridge, Massachusetts response came from Burmeister and Turnovsky (1972), Burmeister and Graham (1974), Burmeister (1976), Brock and Burmeister (1976), Burmeister and Hammond (1977), and Burmeister and van Long (1977). They married the neo-Walrasian approach of specific,