means restricted to the Nazi side during the war, suggest the agonizing exasperation that some of the dutiful industrialists must have felt as they saw how Hitler used the products of rational organizational and managerial techniques in a notoriously intuitive way (Speer realized that Hitler distrusted technology more sophisticated than that of the war in which he had fought as a corporal). As for Speer, he seems to have been able to tolerate the inimitable style of the man who raised him from unknown architect to master builder and friend of industrialist — until the war was clearly being lost.

* * *

TECHNOLOGICAL GROWTH AND SOCIAL CHANGE: ACHIEVING MODERNIZATION. ***By Stanley A. Hetzler. New York, Frederick A. Praeger, 1969. Pp. x + 302. $7.50.***

Reviewed by W. W. Rostow
Professor of Economics and History
University of Texas, Austin

Professor Hetzler is a sociologist, knowledgeable about electronic computers, and has served abroad on the faculties of the American University at Beirut and the University of Costa Rica. These interests and experiences are reflected in his wide-ranging book.

It is dominated by one central and one subsidiary idea. The central idea is that modernization, at its core, consists in the progressive absorption into society of new technologies. The subsidiary idea, an extension of Parsonian sociology, is that machines are active role players in society with whom man interacts. In the quite technical sense in which the sociologists use the term, he asserts (165): "The machine is an actor."

With these two propositions in hand, he introduces (161) his doctrine that *"technological growth occurs as a series of changes in the ways in which men interact with the machines with which they work."* On this basis, Hetzler proceeds to write about a good many matters.

In Part One he explores the dilemmas of both technologically advanced and transitional societies. In Part Two he criticizes the approach of economists to development and judges that present social and cultural approaches to the analysis of modernization are equally flawed. In Part Three he introduces, as an alternative to my stages of economic growth, his stages: Basic Production, Factory Production, Elaborative Production, and Full Automation. He then uses these technologically defined stages to propose guidelines for development planning for nations at various stages of growth. As one would expect, his prescriptions run to the direct introduction of new technologies and their application to each nation's mix of resources. Part Four explores his views on the implications for the structure of advanced societies of increasing automation, which he takes to be the essence of what will happen to us.

Professor Hetzler permits himself a good many *ad hoc* observations on matters ranging from Vietnam to the alleged attractiveness of Communist aid programs. These are generally couched in the rapidly obsolescing clichés of the New Left. But his principal themes and the

conclusions drawn from them can be separated from this philosophizing and constitute a coherent statement and point of view.

I have a certain sympathy with his insistence that the absorption of new technologies is the basis of modern growth, and with his uneasiness that economists tend to slide off into the world of national income analysis where a sense of the technological content of investment is diluted or lost. And I agree that sociological and cultural analyses of modernization are diminished by a failure to grip directly what is involved in the coming of new technologies. Some of the most engaging portions of his book are the passages on the quasi-human relations between men and the machines they work with (especially 168–181).

But it simply doesn't do to cut yourself off totally, as Hetzler does, from what economic analysis has to contribute. The critical linkage between technological and economic analysis is, in my view, the sequence of leading sector complexes in which my stages of economic growth are rooted. These, in turn, owe a good deal to the early work of Simon Kuznets, Arthur F. Burns, and Walther Hoffmann. Hetzler's book is weakened by his failure to take this body of what might be called bridging material — between technology and economics — into account.

The leading sectors introduce immediately the recognizable economist's world of cost reduction and of income and price elasticity of demand. One can then move on in an orderly way to the analysis of investment patterns and the capital-output ratio. I believe we all have a good deal more work to do in linking technological and economic analysis; but I see little hope in Hetzler's four technological stages, which are as divorced from economics as a Harrod-Domar model is from technology. Similarly, Hetzler's technocratic bias leads him somewhat astray as he looks to the future. Clearly, we have not seen the end of electronic computers and what they can do for us and to us. On the other hand, it is already clear that as real income per capita takes us beyond the mass automobile, durable consumers goods, and suburbia, man looks to education and health, travel and recreation, and in time, probably, to increased leisure. This is a stage — which I have called the search for quality — to which, surely, the computer is not irrelevant but which Professor Hetzler's limited insights do not greatly illuminate.

* * *