Not all sociologists adhere to the view that sociology is a science of sorts. The minority believing sociology is a science agrees it is very desirable to reach an integration between social theory and empirical social research. The integration comes about by the two activities, theory development and gathering of evidence, inspiring and reinforcing each other: research improves theory and theory improves research. More precisely, evidence, produced by research using appropriate methodology, somehow speaks to the validity and usefulness of theory, and theory inspires procedures and questions for the research enterprises. The dual nature of the integration has been elegantly discussed by Merton (1957a, b) in two essays that form some of the few enduring classics of sociology published after 1920.

If this happy integration is to be achieved, theory development will be steered by reality rather than fantasy, or ideology. This may make the social world described by theory less strange and quixotic than suggested by post-modernist and similar current versions of contemporary sociological theory. Further, the integration may make sociological research more focused on answering questions about how social processes work rather than focus on interesting phenomena, such as identity formation among ethnic minorities, or the nature of the risk-society. The integration presumably would also make sociologists engage in the same kinds of activities as other scientists—adjudicating theories with observations and designing research to test predictions from theories.

While the goal is agreed upon, the means to reach it are not. The choice of theory is obviously important since not all theories are likely
to be amenable to integration with empirical observation. In this article, I will first discuss the requirements of sociological theory for the integration of theory and observation. I will argue that theory that focuses on explaining how change is brought about is most likely to produce a fruitful integration of theory and research. These are then theories that focus on specifying mechanisms for change in social processes. They come in two types, I will argue: push and pull theories, or causal and rational choice theories. Both types of theories can and should be represented in models for how change occurs. These models are differential or difference equations. Their solution gives models that express the relationships or associations between observed variables. These relationships will have a certain functional form, dictated by the proposed mechanisms for how change is brought about.

Understanding the association between observed variables is what most of us believe research is about. However, we rarely worry about the functional form of the relationship. The main reason is that we rarely worry about how we get from our ideas about how change is brought about, or the mechanisms of social processes, to empirical observation. In other words, sociologists rarely model mechanisms explicitly. In the few cases where they do model mechanisms, they are labeled mathematical sociologists, not a very large or important specialty in sociology.

We need to estimate relationships in order to figure out if our theoretical ideas have some support in evidence. For this purpose, we use statistics. Statistics is a branch of mathematics and might seem alien to sociologists for this reason. However, while sociologists are not very eager to formulate their theories as mathematical models, sociologists are very eager to learn statistics, and quite good at it. They therefore use statistical models to estimate the relationships that concern them in research. These statistical models are usually presented by statisticians as default models, to be used when a substantive model is lacking. The models are invariably additive, at least as a point of departure. They have the virtue of being parsimonious. The statistical models have the defect that they sometime are poor theories of the processes under investigation.

My main purpose with this article is to emphasize the importance of modeling theoretical ideas about how change comes about when studying social processes and the unfortunate consequences of taking ad hoc statistical models as models of substantive processes. There has been much recent discussion of ideas about causality in sociology and