Anyone who is asked to examine the condition of a field is bound to be governed to a certain extent by his or her own biases. I suspect that this is more true in the field of curriculum than it is in many others. Therefore, for whatever biases I am about to impose on you, I apologize, and I shall try to keep them at a minimum.

The Definitional Problem

In my judgment, the foremost problem confronting the curriculum field is a definitional problem. I do not mean just the word curriculum itself, but rather a whole set of constructs that give meaning to the field. Any field that is to be organized, conducted, and researched must be undergirded by a set of "givens" or axioms. These are the definitional structures of the field in question. In curriculum, most everyone is willing to offer some sort of definition of what he or she means by the word curriculum. Unfortunately, the variability in construct of this term, as evidenced by writers in the field, is extremely broad. The range is very great. Roughly, it runs from the conception of a curriculum as being a set of specific objectives to something that seems to resemble a whole educational enterprise. In the language that is sometimes used, definitions of curriculum are either distinguished from or associated with instruction, teaching, and evaluation. Looked at another way, there seems to be some confusion as to whether curriculum is a noun, an adjective, or some other part of speech. For example, it is one thing to talk about a curriculum, in which case the word is being used as a noun. It is another thing to talk about curriculum planning, in which the word curriculum becomes an adjective. It is another thing to speak of the curriculum field, and again, the word curriculum becomes an adjective.

Since the days when Franklin Bobbitt wrote the first definitive work in curriculum in 1918, the primary curriculum question has been "What shall be taught in schools?" When people sit down to answer that question, the result of their decisions may be interpreted as a curriculum. The form in which those decisions are expressed may be termed the design of that curriculum. During, and subsequent to, the decision making about curriculum design, decisions have to be made about the use to be made of the curriculum, how it is to be evaluated, and how it may be revised. These questions are preliminary decisions necessary for the processes of curriculum engineering.

However, where we get into great difficulties is when we try to answer the question of "What

shall be taught in schools?" and the question 
"How shall it be taught in schools?" at the same 
time. Here I am making a distinction between 
curriculum and instruction. Whereas the primary 
curriculum question is "What shall be taught in 
schools?" the primary instructional question is 
"How shall it be taught?" Parenthetically, one 
should include the choice of instructional mate 
rials of all kinds with the "How to" question. 

The definitional problem is cancerous in its 
effect on both the practical and the theoretical in 
the development of the curriculum field. The ques 
tion of boundary between the curriculum field 
and other fields to which I have just alluded is 
probably the most complicated. We ought to be 
able to identify the environment, or the geogra 
phy, of the total curriculum effort. There are some 
rather distinct differences between the environ 
mental conditions of curriculum planning com 
nittees and those of a teacher and a group of 
students interacting in a classroom; that is, the 
environment of the curriculum committee sitting 
around a planning table is distinctly different 
from the classroom environment. The people in 
volved do different things. Conceptually, they 
have different problems. Their activities are dif 
ferent. We ought to be able to define these differ 
ences in terms of tasks and processes involved 
in the two environments.

Curriculum Design

Another way of looking at the condition of 
the curriculum field is to examine the state of 
affairs with respect to curriculum design. One 
may speak of curriculum design as being a sub 
component of the curriculum field. Generally, dis 
cussion about curriculum design refers to a cur 
riculum. One argument may be about the form 
and arrangement of a curriculum. By this I mean 
identification and description of the various parts 
of a curriculum, or the organization of the parts 
of a curriculum. Essentially, this becomes a dis 
cussion of what shall a curriculum contain. Perti 
inent questions in this connection are: Should a 
curriculum contain a set of goals or objectives? 
Should a curriculum contain a body of culture 
content that is deemed appropriate for the achieve 
ment of those goals or objectives? Should a cur 
riculum include suggested activities for students 
in the implementation of the curriculum? Should 
a curriculum contain recommended instructional 
materials? Should a curriculum contain any rules 
of governance for the curriculum's use? Should a 
curriculum contain a scheme for its evaluation? 
Should a curriculum contain all of these? I sup 
pose one could legitimately ask the question, 
"Should a curriculum contain none of these?" I 
am confident that one could find persons who 
would respond "yes" or "no" to all of these 
questions, and those who would suggest all pos 
sible combinations between "yes" and "no."

We seem to have sublimated the old curricu 
lum design question of subject-centeredness ver 
sus nonsubject-centeredness. The vast majority of 
today's curricula are subject-centered. True, there 
are a few examples of attempts at integration and 
openness in design. I think it is important for us 
to note that the condition of the area of curricu 
lum design as a subcomponent of the curriculum 
field not only poses problems for us in communi 
cation, but the condition renders research in the 
area of curriculum design almost impossible. Re 
search in curriculum design has always been ex 
tremely complicated because of reluctance to posit 
one design against another and to observe the 
consequences. To note the condition of curricu 
lum design as revealed through curriculum prac 
tices in schools, one merely has to look through 
the exhibits of curriculum materials displayed at 
ASCD conferences.

Curriculum Engineering

Now, let me turn to another subcomponent 
of the field of curriculum that may be called "cur 
riculum engineering." My use of the expression 
"curriculum engineering" is to help surmount the 
great confusion about processes related to cur 

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curriculum generation and use. I refer to processes that are known as curriculum planning, curriculum development, curriculum improvement, curriculum implementation, curriculum evaluation, and so forth. Now, there is very close identity for curriculum engineering with actual practices in schools. It is there that curriculum planning, curriculum implementation, curriculum evaluation, and any other curriculum processes one can identify take place. Anyone who sets forth theoretical statements about curriculum engineering is forced to do so in light of the circumstances and conditions of the real world of schools. Statements may be prescriptive in nature, but they must be reasonable for adaptation in working settings. We may speak of curriculum design as the product aspect of the field of curriculum; we may refer to curriculum engineering as the process dimension of the curriculum field.

We are all aware of the kinds of curriculum processes that are at work in public and private schools. We have evidence that they are creating products that are called curriculum materials. Since the early days of Hollis Caswell and his work, we have had large numbers of persons involved in curriculum planning processes and, for the most part, they have been teachers and other curriculum workers. In very recent times, we find people more concerned about who is to be involved in curriculum decision making than we have in either the processes they use or the products they produce. This was brought out most emphatically by the recent Curriculum Development Task Force in the National Institute of Education. That task force under the leadership of Jon Schaffarzick has been very carefully probing into the concerns of persons who, although from a variety of positions and statuses, have some concern for the improvement of curriculum development in this country. Coming back to the products of these efforts, the visible products are rarely seen external to their origin unless they are submitted to curriculum materials such as those exhibited at ASCD conferences or at some similar occasion at a more local level. It is becoming increasingly difficult for libraries that do not have substantial funds to maintain collections of curriculum materials so that students of the field can have a reasonable opportunity to examine them.

For as long as I can remember, reviews of research on curriculum planning have decried the paucity of research in that area. To a very great extent this is still true; however, some of the recent work by Walker and Schaffarzick suggests some new and promising approaches. When one looks at a curriculum emanating from a project about which he or she knows nothing, it is tempting to ask, "How did these people arrive at this cluster of decisions?" I often think that every curriculum planning project should have a historian who would keep a record of events leading to the planned curriculum, and an interpretation of why and how those events occurred. Perhaps the history should be part of the curriculum.

The missing link in American curriculum engineering is the process of curriculum implementation. Implementation may be thought of as a process of moving so as to ensure that the curriculum is used by teachers as a point of departure for the development of their teaching strategies. It is the means of transmitting the spirit and the content of the planned curriculum into the instructional process. More specifically, it may be thought of as the transition from the relatively static nature of the curriculum to an action strategy. Functionally, one may visualize the implementation process through the work of a teacher who has before him or her the curriculum in one hand, and whatever device that a teacher uses for developing a teaching strategy in the other hand. Implementation is the process of crossing over from one of these types of entry to another.

We have quite a history in the United States of having planned curricula, but having little or no notion as to whether those curricula have been implemented. The stereotypic tale of the teacher who hides the curriculum in the lower right hand drawer of the desk, so that it will not interfere with his or her customary approaches to teaching, is a familiar one to all of us. This ought to be considered a relatively sinful act. Where a commitment has been made in a school or a school district that is expressed in the form of a planned curriculum, not to implement that curriculum with all possible vigor is to waste the human effort involved in its planning.

It is difficult to discern why this condition prevails. It would appear that we act on a blind faith that the sheer distribution of the curriculum
to teachers will cause it to be implemented. The Minister of Education in France and the Minister of Public Instruction in Italy could show us a lot about implementation techniques, because they have to provide for such things in national curriculum systems. However, I hasten to add that I would not recommend those techniques for adoption here in the United States. But, if my analysis of curriculum implementation as a missing link is at all accurate, it behooves us to search for procedures and processes that are acceptable to us and amenable to scrutiny. Then we can examine the process for purposes of facilitating feedback and correction from experience had with use of the curriculum for consideration by curriculum planning groups.

Research on curriculum implementation is not at all difficult. There have been several studies of the process, particularly by doctoral candidates at universities. However, they have mostly confirmed the circumstances and conditions I have been discussing. We certainly could use some good comparative studies that would teach us the merits of differing approaches to the task.

Curriculum Evaluation

Until quite recently, curriculum evaluation has almost totally been avoided. But when people began to sponsor the concept of curriculum being a series of highly specific objectives (and the more behavioral, the better), curriculum evaluation began to be discussed more concretely. Measurement and evaluation are much easier under this condition than some others, which I shall mention in a moment, because once one has a highly specific objective stipulated, it is a relatively simple task to transform that objective into a test item or into a mode of observation. In other words, the criteria for making evaluative judgments are inherently built into the specific objective.

Whenever we wish to assess the effect of the curriculum upon the students, we must do so in light of the degree of curriculum implementation and the quality of instruction that took place.

Curriculum Theory

Since the appearance of the Herrick and Tyler monograph in 1950, there has been increased interest in the development of curriculum theory. Presently, curriculum theory, or the development of curriculum theory, is in a somewhat paradoxical condition. The curriculum field is retarded by a lack of carefully worked out definitional and boundary structures as I indicated at the beginning. On the other hand, the development of definitional and boundary structures is precisely what a theory is supposed to do for you. So, curriculum theorists find themselves in the position of being unable to challenge one another about the field because they are constantly arguing at the axiomatic level rather than positing challenging propositions about the same phenomena.

It would help communication about curriculum theory considerably if writers on the subject
would clarify the levels at which they are working. As I understand it, there are two principal modes of theory development. One is the development of philosophic or speculative theory, and the other is the development of scientific theory using the models set forth by philosophers of science. Both by definition have to be committed to the development of explanation of some set of events, in our case, the set of events we are going to call curriculum. In an applied field like education or curriculum as one dimension of education, speculative theory can carry us only so far. The moment one posits hypotheses to be tested and intends to test them empirically, he or she must move to the scientific processes in theory building. So far in the development of curriculum theory, speculative theorists seem to be working in one direction while those interested in scientific processes move in another. We are really in a very naive state in theory development.

I cannot leave this discussion of curriculum theory without one or two comments about research. It is generally accepted in the social sciences that one of the most profitable ways to develop knowledge in a field is to launch programs of vigorous theoretical research. In the field of curriculum, there is a paucity of serious, controlled research. There is also an absence of theory-based research because most of our so-called theoretical statements are not translatable into research hypotheses. Claims are made from time to time that research models and procedures used by researchers in other fields are not appropriate for curriculum research and that we should seek alternatives. I am of the opinion that we ought to grow up in the use of conventional modes of research in curriculum before we can hope to have the ingenuity to develop new ones. This does not mean that we may ignore historiography, critical analysis, or as Elliot Eisner has suggested, forms of art, criticism, and connoisseurship where they are appropriate. But when we are seeking predictive and causal relationships among curriculum phenomena using quantitative data, presently accepted research modes will probably serve us well.

A final comment. For many years, there has been thrusting and parrying back and forth between the public schools and colleges and universities about in-service education. Universities, on the one hand, have said that in-service education was the province and the responsibility of school systems; theirs was preservice and advanced degree programs. Public schools, on the other hand, have offered scanty programs of in-service activity, and they have provided for progress on salary schedules for their teachers, and, in many cases, as a requirement for permanent certification, the accumulation of a given number of semester hours of credit at universities. The result has been no help with in-service problems whatsoever. It is time, within our profession, to demonstrate better arrangements.

Let us assume for the moment that curriculum engineering ought to be the continuous heart of any in-service education program. So considered, participation in curriculum work on the part of all teachers and administrators would become a condition of employment. If we could become committed (on both sides) to such goals, we should be able to find a cooperative approach between the public schools and universities in making it go. If the schools are willing to engage in the curriculum processes, they will need help in leadership, processes, and techniques from outside their own domains. Such help can be provided by universities, but they would have to leave the decision-making process up to the school personnel. There is no hope that universities can work with all of the school districts in the United States in such capacity, but models could be created for others to follow. More important, such arrangements would provide much needed opportunities for the collection of data, and for what Eisner has called danda, for the much needed research in curriculum.