Piecemeal information (some environmental, some behavioral) not closely connected with the values of the people and the sub-cultures directly involved is the basis for the ad-hoc approach. Whether you like and use the subjective or the ad hoc approach is beside the point. They are both bad -- that is, less than optimum for the beginning student in architecture.

The Bauhaus and its successors approximated the horse manure approach. The Ulm School of Design fit this mold with more flair when it came to spreading it around -- but it also just dropped on the student from on high. On the other hand: community design centers approximate the chemical composition approach -- pieces of miscellaneous information, often picked up from around campus, are put together and used in an indiscriminate fashion. A number of schools of architecture are following this pattern -- their touch of academia mixed into the new compositions for both ad hoc flair and status.

Now, the general question of optimum development for the beginning student in architectural education is a tough one to ask precisely because the above approaches all make the task look both easy and worthy. Students in the above approaches notice mainly the fun they have "doing it", whatever it is at the moment. Professors also enjoy the fun of "doing their thing" as well as "doing good". I believe the above approaches, overall in the main subjective, are highly questionable.

II.

The best basis I know for working with the beginning student in architecture follows the more recent quest for objective and public understanding of particular behavior-environment relationships. Information on both covert and overt behavior in direct connection with both social and physical environment will more and more provide an intelligent basis for first-rate environmental planning and design. The beginning student educated on this basis would learn to handle, and thereby to value, such information. The advancing student would actually generate new psycho-cultural information-systems.

For instance: new knowledge from recent studies of perception (since 1950, just shortly before the birth of the beginning student in architecture today) adds up to a solid conclusion.

MILWAUKEE CONFERENCE ON THE BEGINNING STUDENT

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WITH UNDERSTANDING: An Optimum Education for the Beginning Student in Architecture

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This conference is concerned with the development of the beginning student in architecture. Accordingly, I will talk on the general question of an optimum education -- or the value of a basic curriculum.

First, I will indicate why this general question is a difficult one to ask. Second, I will set forth the best basis I know for answering the question once it is asked. Third, I will outline an optimum education for the beginning student -- which I take to be our mutual concern.

I.

To begin in a roundabout way: here we are in Milwaukee on the shores of Lake Michigan where the beaches have been closed to swimmers over the past few years. The run-off of fertilizers from the farms of Wisconsin through rivulets and tributaries adds a considerable measure of pollution to Lake Michigan. Now, you all probably know that the new chemical fertilizers contain nitrate which, in turn, promotes water pollution. But do you all know that horse manure also contains nitrate?

Both horse manure and the new chemical fertilizers contain nitrate -- and both are contrary to the optimum well-being of human ecosystems. Neither composed and ministered by man in the interests of a greater yield, or whether dropped by animal -- nitrate is nitrate. Both approaches are less than optimum -- and there's a close parallel to this situation in education for the beginning student in architecture.

Speaking directly: the traditional beaux-arts as well as subjective approaches in architectural education are like animal droppings -- on the order of horse manure. They were and are just dropped on the beginning student, so to speak, from above. On the other hand: modern ad hoc practices (to include "advocacy design" with its excesses of neo-paternalism, etc.) are like the ministrations of man -- on the order of the new chemical fertilizers.
Based on this new knowledge in the study of perception since 1950: INFORMATION ORGANIZED INTO VERBAL CATEGORIES AND SEQUENTIALLY ORDERED INTO DYNAMIC TRANSACTIONS PROVIDES THE BEST BASIS FOR WORKING WITH THE BEGINNING STUDENT. We (the instructors) and they (the students) see in terms of what we and they already know verbally, what we and they are currently looking for verbally, and what we and they hope to see verbally.

Seeing and thinking are basically verbal. On the other hand -- and I would like to suggest for the optimum education of the beginning student; way over on the other hand -- drawings, architectural models, photographs, and other modes of visual notation merely illustrate our vocabulary of verbal categories, our verbal sequences, and our verbal transactions. I say merely because I want to stress the fact that there is no direct path from visual notations to seeing and thinking and back again. That path necessarily leads through speaking and writing in terms of words and sentences -- that is, in terms of language per se.

Because we deal with many visual illustrations of verbal categories, we may refer to vocabulary in architectural education as visual-verbal. Let's not forget, however, that seeing and thinking are basically verbal. Visual notations can only illustrate verbal categories, sequences, and transactions. If we do not in architectural education and practice become increasingly precise, definitive, systematic, and coherently organized in terms of words and sentences -- all else is just so much nitrate.

A picture may be worth a hundred words (or a thousand or just a few) but we still need the words and sentences to understand the picture -- to handle the picture with understanding. The gesture may illustrate the word, but the word can stand alone -- the gesture cannot. Let's move beyond subjective and ad hoc approaches in architectural education, especially for the beginning student.

III.

The key to an optimum education for the beginning student in architecture -- that is, one with understanding -- is

on the problem of perception, or "how seeing takes place". In turn, this may solve the problem of conception, or "how learning takes place".

For a long time before the 19th century, perception was a problem in the geometry of the eye. During the 19th century the question of "how we see" became more and more a problem of optics. Towards the middle of the 20th century the study of perception finally broke loose from its age-old strait-jacket when the field of general semantics established the concept of the eye "as an end organ of the brain". Other intellectual developments were instrumental in the transition away from the simplistic problem of optics. For example: the concept of information gained practical importance after Shannon and Weaver wrote The Mathematical Theory of Communication in 1949.

Gibson made the pioneer breakthrough in the study of visual perception in 1950. His publication of The Perception of the Visual World upset the old notion that seeing was a matter of optics in here. Gibson showed in an objective and public way that it was largely a matter of information output. In 1957 Bruner established the base for the understanding of information, organized through psycho-cultural experiences, in the form of verbal categories. Accordingly, the problem of optics resolved into the problem of language.

In 1960 Ittelson's work on visual space perception further established the contribution of the perceiver's experience in the process of seeing. Ittelson called this behavior-environment relationship a transaction -- a process of "giving-and-taking", a highly dynamic event like "buying-and-selling", "writing-and-reading", etc., where you can not have the one without the other.

Further investigations brought categories and transactions together, and in 1966 Hochberg showed that the structure of meaningful perception was built-up in a certain order or sequence. Thus, today on the basis of recent studies we know that perception is (1) categorical, (2) sequential, and (3) transactive. In terms of the problem of language: seeing and thinking depend upon (1) a vocabulary of verbal categories, (2) a syntax of verbal sequences, and (3) a semantics of verbal transactions.
an objective visual-verbal vocabulary. As indicated above: the perceived objects, persons, and events in any conceptual organization have meaning in terms, first and foremost, of words and sentences. The smallest unit of meaning is the word, and a string of words arranged according to certain rules gives rise to the meaningful sentence.

Further, perception always belongs to somebody: we use symbols in the process of architecture for somebody else to use an environmental object in direct connection with a behavioral event. Accordingly, a technical vocabulary in architectural education that handles social and psychological as well as physical information is the fundamental key to the success of the architectural practitioner.

The beginning student starts to learn his professional concepts and categories with understanding through definitive words and sentences. The process of physical problem-solving works today because the technical vocabulary of physical information accommodates both old and new knowledge in construction, structures, environmental controls, etc. This has been the professional architect's legitimate basis for public service — and, thereby, for public respect. In the area of social and psychological information, however, the architect today uses, and can only use, the layman's vocabulary.

Architectural students, educators, and practitioners are all in the same boat. Yes, architectural students do acquire a limited physical vocabulary from educators and practitioners, namely: Sweet's File, the Steel Handbook, and symbols for working drawings. But students, educators, and practitioners all, by and large, sorely lack a technical vocabulary (visual-verbal categories and concepts) for seeing and thinking with precision and clarity about man-environment systems and behavior-environment relationships. Their subjective and so-called "conventional wisdom" is virtually useless to meet the demand in today's world of environmental problems.

The environmental problem-solving of architects today amounts almost to sheer quackery. Witness the results in low-income housing, for example: Pruitt-Igoe in St. Louis, the wall of
List of references to accompany paper on "The Beginning Student":


Please remember the above sub-vocabulary or visual-verbal data-structure for psychological information and the other sub-vocabularies for social, physical, and communication, and decision-making information are experimental. Other categories in each of the sub-vocabularies may be considered more appropriate or more important as time goes by. I have shown the IMAGE data-structure simply to illustrate what the order and hierarchy of a viable vocabulary for the beginning student might become in an education based on objective and public information -- that is, one with the clear-cut understanding that design is not an arbitrary affair.

To sum up: the selected visual-verbal data-structure or technical sub-vocabulary shown above is only one out of a total of five sub-vocabularies. It may help to illustrate the suggestions I have outlined in this short talk on the general question of an optimum education for the beginning student in architecture: we are on the threshold of a transition era in architectural education -- from a variety of visual and subjective approaches without understanding to an objective and visual-verbal approach with understanding.