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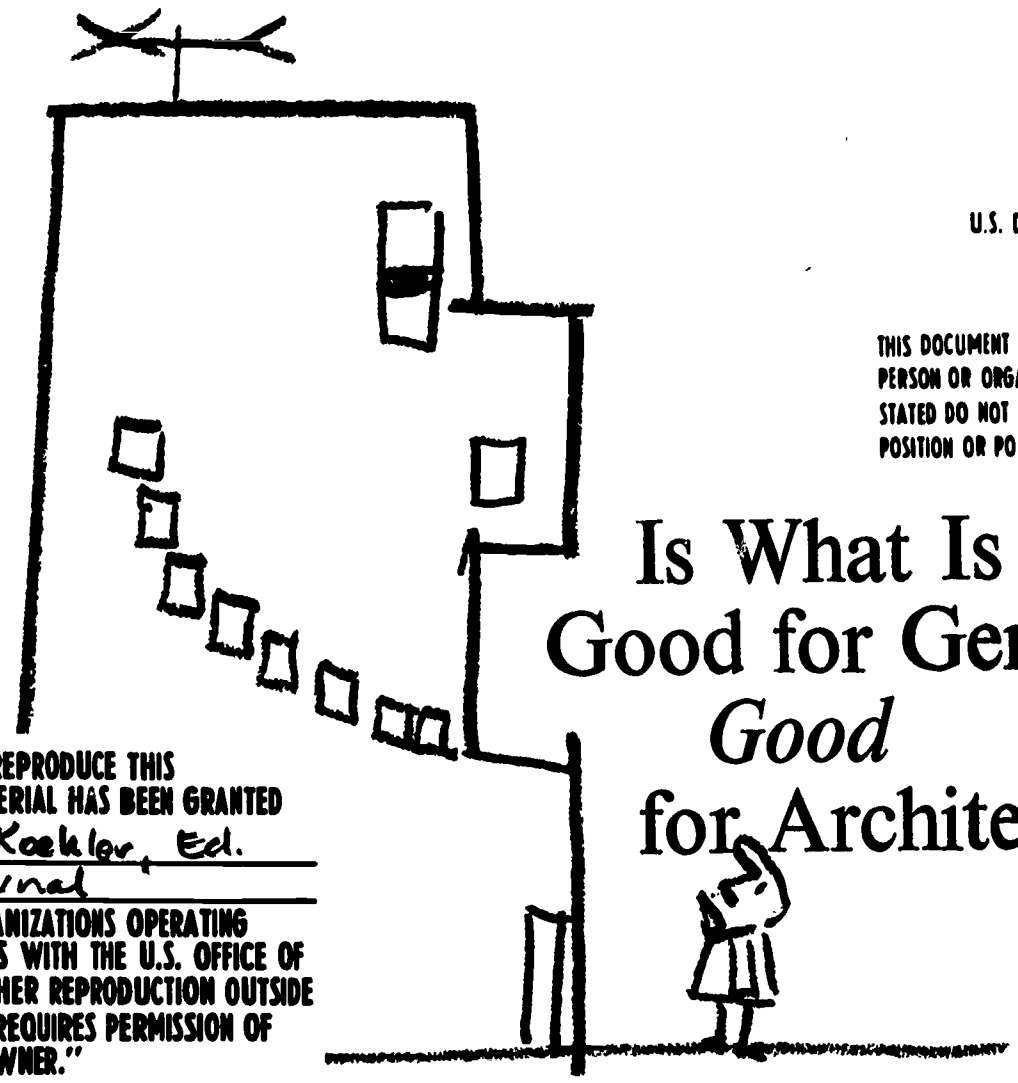
Problems of behavioral evaluation and determination of initial building stimuli are discussed in terms of architectural analysis. Application of management research techniques requires problem and goal definition. Analysis of both lower and higher order needs is contingent upon these definitions. Lower order needs relate to more abstract psychological functions such as--(1) social interaction, (2) recognition, and (3) esteem and self-fulfillment. Examples of higher order needs measurement and evaluation illustrate implicit methodological difficulties. (MH)



Is What Is Good for General Motors *Good* for Architecture?

BY RICHARD MYRICK, BARBARA S. MARX & STANLEY L. COHEN

A research team at George Washington University suggests some of the ways in which psychology can make a contribution to architectural thinking.

CHANCES ARE that events in the field of management over the last 30 years are about to be re-enacted in the profession of architecture.

They were events that grew out of research findings in social and industrial psychology. They shifted management from an emphasis primarily on basic skills in planning, delegating, controlling and evaluating an organization's activities to one of understanding the equal importance of concepts about the needs, motivation, perception and social interaction of people.

Specifically, the re-enactment of these events in architecture is likely to involve the redefining in social science terms, as well as in architectural terms, of many environmental design problems. Types of buildings most likely to be involved in the redefinition are schools, dormitories, hospitals and clinics and office buildings; in short, buildings in which social interaction and social structure are particularly important.

It should first be noted, however, that a broad and important goal is shared by architecture and management; and unless we recognize this common goal, it is hard to see the relevance of social science and management research to architecture.

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Management and architecture both attempt to satisfy two kinds of human needs, which, using the terminology of the well-known social psychologist A. H. Maslow, are lower order and higher order.

Typically, lower order needs relate to physical requirements which, translated into architectural terms, consist of such things as adequate space and equipment, adequate lighting and temperature control, and convenient location of the parts of a building that a person has to use. Higher order needs typically deal with psychological needs, such as the need for social interaction, recognition and esteem and self-fulfillment.

For an example of the effect of these different needs in a management situation, take the secretary working in a typical office. Her lower needs would be met by such things as good pay, job security, convenient working hours and a brand-new electric typewriter. Her higher order needs would be met by such things as finding her work satisfying, feeling she is an essential part of the organization, being able to have good relationships with other people in the work situation, and understanding how her particular job contributes to the goals of the organization as a whole.

Now, if many of the higher order needs are *not* met, poor morale and low productivity, together with the adoption of goals contrary to those of the organization, will often result even though many of the lower needs are satisfied. Frustration of higher order needs can lead to various subtle but powerful expressions of damaging negativism.

Consider some possible effects of the architecture of a building upon lower and higher order needs, keeping the secretary in mind. Some of her lower order needs are met by providing not only the rudiments of shelter but a convenient arrangement of working spaces and an interior and exterior design that she finds esthetically pleasing. A sample list of certain higher order needs to which the architecture of a building can contribute is nearly identical to those which can be met by appropriate administrative actions on the part of the management.

The architecture, for example, might help the secretary understand how her job relates to the work of the organization as a whole if the plan of the building helps make visible to her the other related parts and their functioning. She might also feel a greater sense of loyalty and affiliation if the

architecture facilitates the opportunity for informal social contacts with her co-workers, making the job more satisfying.

Some critics will argue that it is extreme to say architecture can have nearly as much influence as management policies on the attitudes and actions of the people who inhabit and work in a space. They would probably be willing to agree, no less, that there is an obvious connection between effective ways of supervising and psychology. In fact, they might contend, "You *have* to use psychology in managing people."

But they would probably reason that architecture provides mainly a physical environment, and what is physical is clearly not psychological.

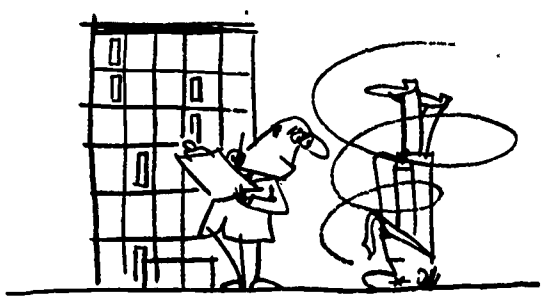
Let us look at these two arguments, considering first the assertion of an obvious connection between the way people are managed and psychology. It is an assertion which makes so much sense to us now that is hard to realize the connection was not always obvious. Management used to be as concerned with lower needs as architecture is today. Few people were aware 30 years ago of the usefulness of psychology in management. Management concentrated on making clear statements and on simplifying and standardizing work procedures—to reduce lost time and motion.

Then came the well-known Hawthorne studies[1] to determine the influence of temperature, illumination and other physical conditions of work on productivity and morale. The results at first greatly puzzled researchers by giving no consistent pattern of answers. Both increases and decreases in the illumination level, for example, resulted in heightened morale and productivity.

It was finally realized, in a revolutionizing breakthrough, that it was the interest which the management and researchers took in the workers—by interviewing them about their opinions and by making tangible changes in their working conditions—rather than the experimental variations in temperature and other physical factors which was raising productivity and morale. As a result of this insight, there came about a gradual yet profound redefinition of management problems in psychological terms.

As for the second argument, that architecture deals only with the physical environment and what is physical is not psychological, the example of the Hawthorne studies suggests that problems originally stated in one set of terms, not psychological, may after a time be defined in terms that *are* psychological. It is almost a matter of whether one wants to think about response as well as stimulus.

The stimulus is the building or the space, or the color, proportions or arrangement of the parts of the building. The response is how the people behave when they occupy the space. As more sophisticated concepts of group behavior with sensitive measurement devices become available to psychology, a great deal may be gained by studying not only the stimulus but also the response. Such research may in time suggest useful ways of modifying the stimulus, the architecture of the building, in order to obtain the desired responses. We may then hope to find answers to questions such as: What is the desired behavior, and what conditions in the building influence it?



If we agree that the important goal of meeting human needs is shared by management and architecture, then, since management has been using social science research to move toward this goal for the last 30 years, and since architecture has been using it in a much more restricted way, we must admit that architects are in a fortunate position. For they stand to gain a great deal from the available research into human behavior if its general applicability is made specifically relevant to architectural problems.

For some perspective on what might be accomplished in the course of translating these behavioral

concepts into architectural terms, consider some social psychology studies which seem particularly relevant to architecture. The Hawthorne studies which originally attempted to identify the ideal working conditions can be compared with a more recent study by the American Hospital Association.[2]

A purpose of this study was to learn more about the circulation of patients, doctors and other per-

sonnel in the hospital. The study was conducted by persons experienced in hospital design, and it involved sophisticated research techniques.

It resulted in general recommendations as to where the main building elements might be located as well as more specific recommendations as to corridor width relative to the number of patients using the corridor, etc. Note the similarities between the Hawthorne studies and this recent hospital design study. Both are concerned with the stimulus or physical conditions. Both seek to make the layout more efficient. Neither is primarily concerned with the response to the stimulus, namely, what the people in that setting see, feel or do.

The main difference between the studies is that the management one was done almost 30 years ago, while the hospital study is less than five years old.

As a further comparison, take a recent study which sought to discover the effects of working in an esthetically pleasing room vs. one that is neutral or displeasing. The task occupants of each room were asked to perform was to rate a series of photographs of faces in terms of how much well-being and energy each face expressed. The photographs used were negatives, which were deliberately vague and unclear, so it was difficult to interpret them. This meant that in interpreting the pictures, the people in the experiment projected and expressed their own feelings of well-being and energy.

Those people in the esthetically pleasing room, rating the same pictures as the people in the other two rooms, consistently rated them more favorably in terms of well-being and energy. However, in the discussion of the findings, the author gives some of the comments of occupants of this room, and one sees that it may not have been the esthetically pleasing aspect of the room alone which led to the favorable responses but associated social aspects as well. One person who sat in the "beautiful" room which had a large executive-type chair in it reported it made him feel like a "big shot" to be in such an office.

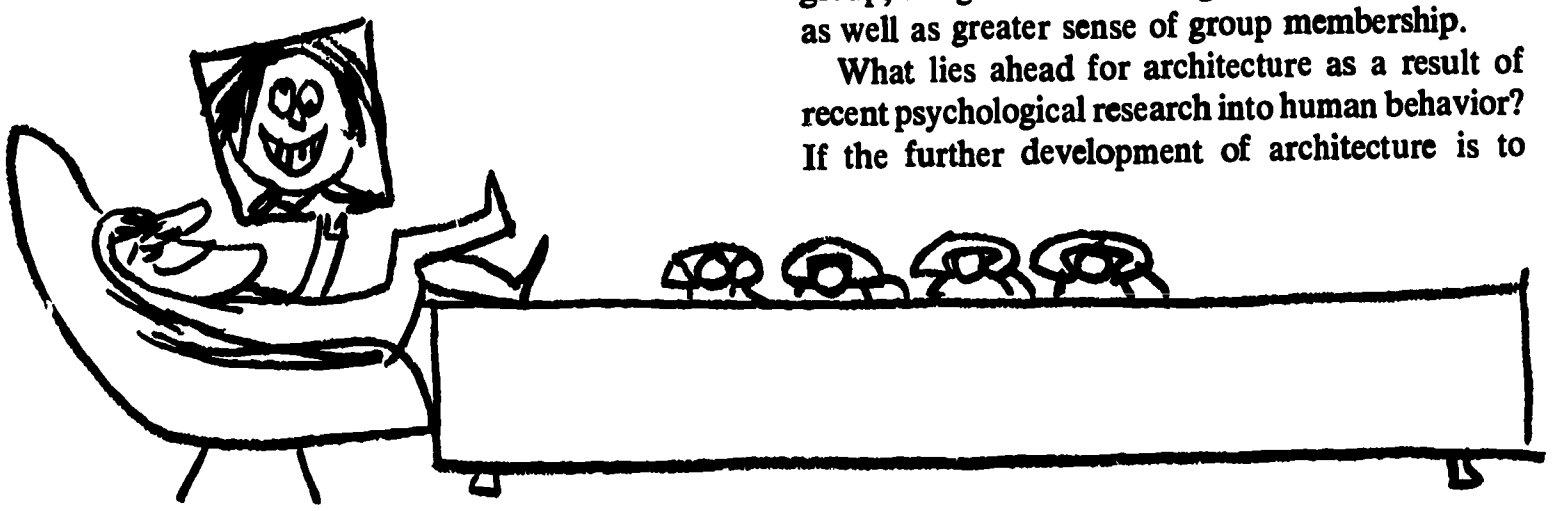
Thus, there is some evidence here that the social meaning of an individual's surroundings may outweigh the esthetic effects. In short, if the surroundings make an individual feel valued, he may have increased morale and a greater sense of well-being and satisfaction.

Another area in which there are parallel efforts in management and architecture concerns social interaction, accessibility and communication between people. Architects have developed a number of devices such as circulation diagrams which designate spaces that should be immediately accessible, and other spaces which require certain intermediary or controlling spaces such as a receptionist's office.

Ingenious as these devices are, they still concentrate mainly on the stimulus. Meantime, management has progressed toward concentration on the response. One experiment conducted by social psychologists and having interesting implications for architecture used five men separated by partitions arranged in various patterns of accessibility. In some cases, the partitions allowed communication with only one or two other men. In others, they permitted communication with three persons, and in one situation all the partitions were removed, and each of the five men could communicate with any of the others.

The study results showed that the greater the intercommunication between the members of a group, the greater the feelings of individual status, as well as greater sense of group membership.

What lies ahead for architecture as a result of recent psychological research into human behavior? If the further development of architecture is to



recapitulate the development of behavior-oriented thinking in management, some speculations are possible. It seems that the higher order human needs will begin to command a greater share of attention in architecture. An impressive list of these behavioral needs has already been drawn up by Lönberg-Holm and Larson.[3] The greatest hope of constructively influencing the behavior of people using buildings appears to lie in the perceptual and social interaction areas.

In the perceptual area, the "image" of the expression of a building will probably undergo considerable development. The word "image" currently seems to have two meanings in architecture. Most typical, it is the idea which is communicated to a person looking at it. This kind of image has been for ages a chief concern of architects. What may change here is the means for evaluating the impact of the image, through new methods of measurement which only now are being devised and refined.

But a second concept or definition of a building's image is just beginning to be developed. Kevin Lynch describes some of its properties in his work "The Image of the City."[4] Here the word "image" connotes the ways in which the individual observer uses a building or area in orienting himself to his surroundings, his route and the boundaries within his confines.

Consider how this concept might be applied to the design of educational buildings. Here, the purpose is not just to keep the student from being lost in the physical sense of the word but also to keep him from being overwhelmed by the volume and variety of subject matter he must study and by the years he must spend in training. The physical aspects are important, particularly because they can give his world a perceptual clarity. But in addition, the architecture of a school building can, by striving to incorporate some of the spatial correlates of educational landmarks, decision points, goals, paths and districts, help the student identify in educational terms where he is, where he wants to go and how he will get there. Much of psychological counseling aims at defining goals and giving a sense of direction. To the extent the architect can help the student establish this sense of direction, he has also helped the student establish his basic motivation.

As for social interaction, it must be said that at some point we have to come to grips with the problem of defining the desired kinds of social interaction. This step was taken in management research with the statement that high productivity and morale were desirable and important. Then, by comparing the leadership, group structure and other factors in desirable and undesirable situations, management identified factors that make a difference. Often, ways of systematically increasing desirable situations resulted.

A similar line of investigation leading to the identification and maximizing of desirable interaction situations can be followed in architecture. Naturally, what constitutes a desired kind of social interaction will often depend on the purpose of the building—or, to put it another way, will depend on both the goals of the organization occupying the building and the needs of the individuals using the building.

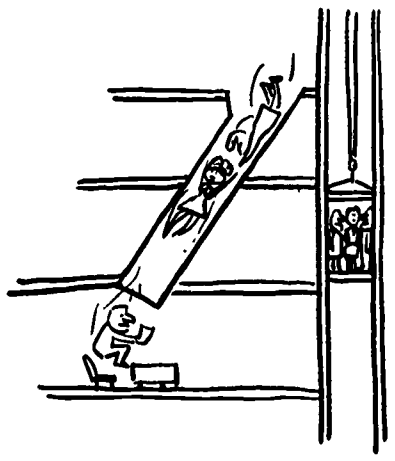
Returning to the example of an educational institution, one might select the social interactions resulting in informal learning as a desirable situation. The term informal learning means learning which occurs by means of casual conversations between students or between students and teachers. In these situations insight into the subject matter, or relationships between ideas, is often expressed and clarified. It is possible to study how a building provides or blocks opportunities for social interactions leading to informal learning, and some such work has already been done.[5]

In both the perceptual and social interaction areas, we are dealing with the human response to the building. But these represent only half the situation. The other half is represented by the building itself, the stimulus. To draw the parallel in management, the productivity of the employees can be viewed as the response, while the type of leadership used in an organization would be the stimulus. Much progress has been made in management research in devising a simple measurement scale extending from autocratic leadership, through laissez-faire leadership, to democratic leadership, on which virtually any kind of management style can be located and described. Such a comparative scale on which virtually any building can be located and described is, as yet, lacking.

Architecture's lack of a comparative scale is a serious drawback because it makes a comparison between two buildings within a single framework nearly impossible. Even terminology incorporating comparative ratings is woefully lacking. Art historians have made some contribution here by introducing terms such as central and longitudinal which can be applied to describing churches. Hereford and Hecker[6] have introduced a measure for school buildings, but although this measure is useful in determining compactness, it is not widely applicable because it is largely influenced by the number of floors. If the architect finds that a building seems to be particularly effective in producing certain desired behaviors, he is hard-pressed to identify and measure what characteristics of the building produce these effects.

In approaching this problem, there are two important management studies which, if tied into

the architectural situation, would be very helpful. The first, a study by Hemphill,[7] asked the question: What are the main dimensions of effective leadership? Hemphill found two dimensions—the ability to initiate activity and a consideration for others. A person might be high on both, or high on one and low on the other, or low on both; in short, these were separate dimensions. The value of this study is that it provides a simple description of the complex task of leadership which then facilitates studying the effects of leadership.



Another study in the field of management which has become a classic compared the effectiveness of autocratic and democratic forms of leadership in supervising a boys' club activity.[8] When judged in terms of motivation, as well as quality of work and the absence of disciplinary problems, the results were strongly in favor of democratic methods. As other researchers have conducted further studies in this area, they have learned more about circumstances in which democratic leadership will or will not be effective.

Were this study to be translated into architectural terms, one probably would not find architectural factors which had meaning closely equivalent to these basic leadership dimensions. The parallel we have in mind is much more abstract. We cannot expect buildings to be pieces of management theory any more than we can expect them to be pieces of "frozen music." But to speculate on the architectural application of these two leadership dimensions, two have already been implied. One is perceptual, and it might measure the extent to which a building allows a person to see and understand the various activities occurring within. If a man goes to see a friend in a building and comes away knowing no more about the latter's activities than what the friend told him, the building would be low on the perceptual dimension.

The second dimension might be translated into terms of social interaction, and might be measured by the extent to which the building provides options for its occupants to meet and talk informally. If a man spends a day in the building where he works, and his only contact with others is officially scheduled, the building would be low on the social interaction dimension. Of course it is not always desirable to be high on this dimension. In almost any kind of organization there will still be needs for isolation and privacy.

Lastly, what will be the role of the architect if new developments relating behavioral and architectural factors take place? Already some architects are demonstrating an awareness of the relevance of social science research to architecture.[9] One reason for this new relationship between the architect and the social scientist is that social organizations, and consequently buildings to house them, have become more complex. But a second reason, perhaps greater in importance, stems from the social organizations who are the clients. The general swing away from autocracy as the preferred form of leadership has frequently left the administrators of client organizations with differences of opinion about their building needs, differences they are unable to resolve among themselves.

The architect finds that if there is to be any architecture at all he must act as an arbiter and take actions which will resolve conflicts and reduce anxieties expressed by a building committee.

We may conclude that architecture in the future will consider the response or the behavior within the building, as well as the stimulus which consists of the building itself. To do justice to the response will involve the creative integration and application of new concepts about behavior and architecture.

The problems of conceptualizing the response—and of determining what are appropriate design refinements to influence it are elusive, but meeting this challenge can raise architecture to new accomplishment.

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