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CONCERNING THE POWER OF CONTENT-IDENTIFYING METHODOLOGIES[1]

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Environmental psychologists are often asked questions such as "How do people experience the environment?" or "What matters to people in the environment?" Clearly the answer to such questions involves preference, but it does not involve only preference. It also concerns the issue of what people find salient in a given scene, the issue of that content which transcends a given scene and provides a basis for responding to a whole group of scenes in a similar fashion.

People react to what they experience (and presumably the outdoor environment is no exception) in terms of commonalities, in terms of classes or categories. Any scene is perceived as a particular instance of a larger class of scenes. What class it is an instance of is not necessarily obvious. A given scene, for example, might be expected to be categorized quite differently by a park manager, a park visitor, a farmer, a forester, a landscape architect, a real estate agent, and so on.

Knowing the basis for identifying content used by the general public is not merely of theoretical interest. It is essential if we are to generalize beyond the boundaries of a particular study, as well as being of great value in making comparisons across different studies and across environments. Content is, of course, not a novel consideration in research on landscape esthetics. Most often, however, it is defined on a priori basis by the investigator. Some classification systems are based on land form and land use, others on management practices, and so on. Unfortunately, effort is rarely made to determine whether such expert-determined categories also serve as categories for the general public. One study making such a comparison showed little relationship between what the experts generated and what the public perceived (R. Kaplan, 1977a).

METHODOLOGICAL CONSIDERATIONS

If one wishes to discover the categories of environmental content that people respond to, there is no way around providing test subjects with a great variety of scenes to categorize. Defining a category is dependent upon multiple instances. While the importance of environmental sampling is widely recognized in principle, in studies of landscape esthetics it is often slighted. In some cases the problem stems from a desire to examine too many types of scenes, forgetting that each type needs replication. Further, having many people react to many scenes readily leads to an overwhelming quantity of data. There is the justifiable fear that such a study could never be analyzed, and if analyzed, never written up, and if written up, never understood.

Fortunately, there is a straightforward solution to the problem. A set of Content Identifying Methodologies (CIM) can be used to identify meaningful content groupings and partition the many instances into a few groupings. Ideally the resulting groupings are not only manageable, but also interpretable and communicable. As the examples I shall mention later suggest, in our experience this hope has been borne out in practice.

There are limits on how much one can ask research subjects to do. With, say 30 to 50 scenes, one cannot very well ask the subjects to rate each one on many different scales. This raises problems for traditional semantic differential procedures. However, asking people for a simple preference judgment works out very well. It is something that people do easily and quickly, it provides solid data for CIMs, and the choice itself constitutes information one presumably would want. Utilizing a broad sample of scenes and a simple preference judgment, it is effective to use two different CIMs. A nonmetric factor analysis and a hierarchical cluster analysis, used together have been found effective. Each CIM works well alone, and they work well together. They provide complementary information, together yielding a larger picture than would be possible with either alone (R. Kaplan 1974, 1975).

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SOME ILLUSTRATIVE STUDIES

The CIM methodology has been applied to a number of different environments. For the most part studies have been focused upon natural or largely natural settings. Across five studies (Ulrich 1973, Gallagher 1977, Hammitt 1978, Anderson[3] and R. Kaplan 1977a) the CIMs employed yielded a total of 27 content categories or dimensions. Initial inspection of these dimensions suggests a rough distinction between those dominated by particular or special content (6 dimensions) and those where the spatial configuration is the organizing theme. The latter are futher divided into four types. A dimension is, of course, defined by multiple scenes, some four to eight in most of the instances considered here.

PARTICULAR CONTENTS

Particular content dimensions are often defined by the context of a particular study. For example, Gallagher (1977) found buildings in a natural setting seem to constitute a particular content (fig. 1, top left). In other studies buildings seem to have a particular content property not necessarily shared by other human-produced elements such as bridges, parking lots, and fences.

One of the dimensions in Hammitt's (1978) study of a bog environment also focuses on the built component in the natural setting. Here, various scenes which included a boardwalk -- a distinctive aspect of a relatively undifferentiated environment -- are grouped together (fig. 1, top right).

Another basis for a particular content category is special knowledge of the population being studied. If there are several scenes representing a single, characteristic type of environment in the area, these may form a dimension even though they are not that similar visually. For example, Anderson (1978) developed a "red pine forest" dimension (fig. 1, bottom left), a configuration well known to local residents.

In R. Kaplan's storm drain study, one dimension included what drain engineers call "impoundments," even though the participants in the study would have been unlikely to have heard the word in that context (fig. 1, bottom right).

The existence of these categories is consistent with the recent emphasis in a number of behavioral fields on the importance of things in human perception and thought. Anthropologists such as Pfeiffer (1972) and Campbell (1974) have pointed to subjects' ability to separate things out of a physically continuous environment as an important facet of human evolution. The importance to the thought process of mental representations of things in the world has increasingly been recognized by cognitive psychologists such as Posner (1973) and Rosch (1977). The use of "thing" in this context is somewhat abstract. It refers not only to pick-up-able entities, but also to other patterns of experience that are sufficiently separable and coherent to be subject to isolation and manipulation, at least in the mind if not also in the world. In this cognitive sense of "thing," buildings, bodies of water, and red pine forests all constitute good examples.

SPATIAL CONFIGURATIONS

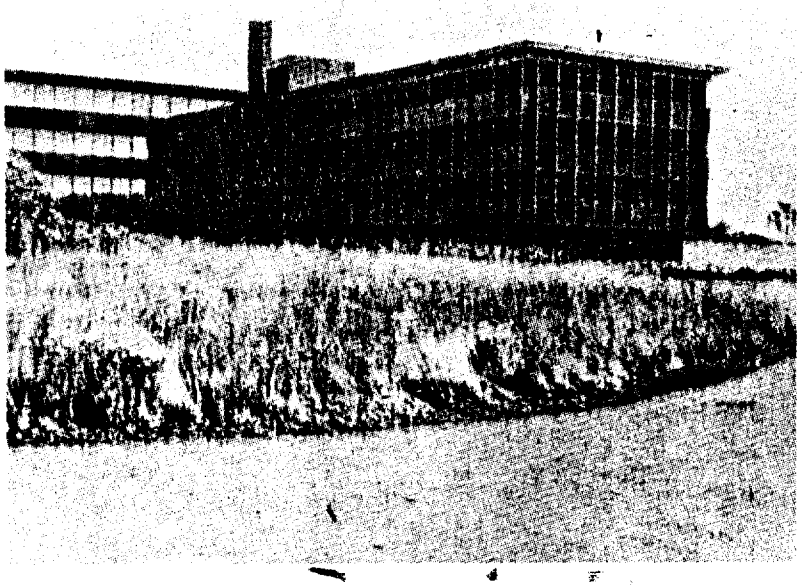
Even more striking than the particular content dimensions, however, is the number of dimensions for which no such distinctive content could be identified. In these cases it is the spatial configuration of the scene that appears to account for the groupings. The "space" in question here is not the two-dimensional space of the picture plane, but the inferred three-dimensional space of the scene which the photograph depicts.

The central role of space in landscape content groupings did not come as a total surprise. There had been indications of the importance of space, (R. Kaplan 1973, S. Kaplan 1975) and the concept of mystery, a powerful predictor of preference, is inherently spatial. Mystery is based on the idea of information gained by going deeper into the scene. Implicit is the notion that certain scenes are appreciated for what it would be possible to do in them. Thus in the case of mystery, "Potential action" is critical to its role in preference. There appears to be a sound basis on theoretical grounds for extending this notion to other spatial configurations as well.

Consider, for a moment, the informational approach to understanding human nature. From this point of view, a human is an active, anticipating organism, always evaluating and preparing to cope with new situations (Kaplan & Kaplan 1978). Presumably, this evaluation and preparation are based in part on the presence of wild animals or other dramatic dangers. But presumably also, there is an evaluation in terms of the possibilities for and limitations of action. An important aspect of a new situation must be what it makes possible, what it permits one to do.

The idea of a rapid, automatic, unconscious evaluation as a component of the perceptual process has recently received support from an unexpected direction. Gibson (1977) has introduced into his framework the concept of "affordance." An affordance is what an object offers the perceiver, or in other words, what the perceiver would be able to do with the object. The concept of "potential actions" is, of course, quite similar, except that it applies to scenes and spaces rather than objects.

[3] Doctoral dissertation in progress, Univ. Mich.



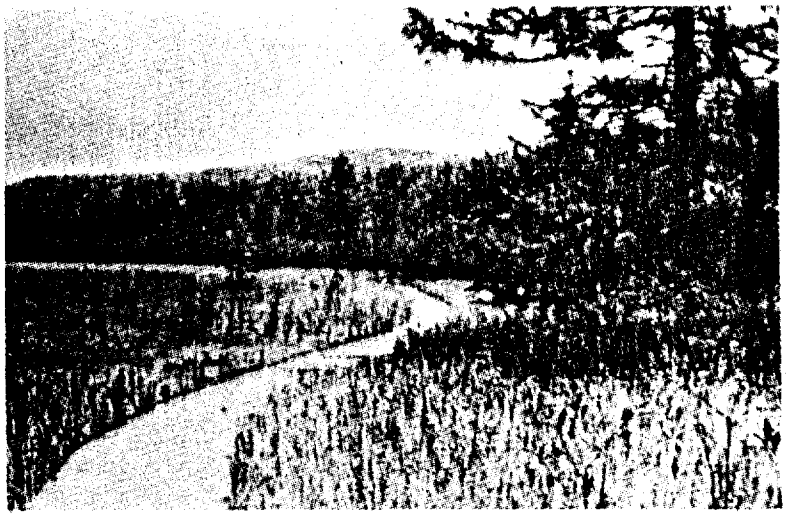


Figure 1.--Examples of specific content dimensions from four different studies.

Open, undefined scenes

Whether the scene is "deep" or "shallow" (S. Kaplan 1975) is likely to provide some grouping information about potential actions. The studies under discussion here, however, indicate the spatial component is considerably more complex than that. One such complication is the matter of how the space is defined. Some landscapes are not clearly either deep or shallow; they are flat, open, and in general lacking in spatial definition. Although the "quantity" of landscape on the picture plane between the foreground and the horizon is generally as great as in any other grouping of landscape photographs, these scenes lack depth cues.

Dimensions of depth are not uncommon in these studies; all but one of the studies had such a grouping. Ulrich's (1973) roadside study (fig. 2, top) is rather typical of this group. R. Kaplan's (1977a) scenic highway study yielded a dimension of depth (fig. 2, bottom), which is quite similar to a dimension from Anderson's forest practices study (fig. 3, top left). A second forest practices dimension, focusing on the visual impact of clearcutting, also falls in this grouping (fig. 3, top right). The dimension from Hammitt's bog environment study fitting this grouping represents a physical environment quite different from the others -- it depicts the bog mat itself (fig. 3, bottom). However, visually it is similar in form to other examples of the depth dimension.

The interpretation of the open, undefined spatial configuration in terms of "potential action" is necessarily rather negative. The very lack of spatial definition makes such scenes difficult to evaluate. There are insufficient cues to know exactly what actions are or are not possible Even a clear judgment as to the distance involved in traversing such an area is hard to make. Such settings reliably receive low preference ratings.

Spacious, well structured scenes

In marked contrast to the open, undefined configuration is the spacious, well structured configuration. The five studies include five such dimensions, two in one study and one in each of three. Trees play an important role in structuring the space in these scenes. In the example from the R. Kaplan scenic highway study (fig. 4, top left) and the Ulrich's roadside study (fig. 4, top right), the near trees play a central role. The other dimension from the Ulrich Roadside study belonging in this grouping depends on trees at a somewhat greater distance from the viewer to structure the space (fig. 4, bottom left) as does the example from the R. Kaplan drain study (fig. 4, bottom right).

These scenes through their greater depth suggest room to operate, places to go, opportunities for locomotion. Given such opportunities for action, one would expect these dimensions to receive high preference ratings, as, in fact they do.

Enclosed scenes

A particularly interesting type of grouping involves spatially well-defined dimensions with relatively limited depth. All these examples provide a sense of enclosure; they contain a screened or protected area in which one might hide. They are not, however, in the nature of cramped one-person hiding places. In fact, most of them seem to offer at least enough room to hide a small car.

Since "enclosure" is as much a functional distinction as a purely visual one, it is perhaps not surprising that the visual forms that seem appropriate to this grouping are highly diverse. There are seven such dimensions, with each of the studies represented. The dimension from the Anderson forest practices study is in a relatively heavily wooded area (fig. 5, top. left). The Hammitt bog environment contributes a dimension both more open and more complex (fig. 5, top right). Two dimensions in this grouping come from the Gallagher naturalized landscape study. For one of these, the enclosure is created by fairly complex configurations of natural elements (fig. 5, bottom left). For the other, elements of the built environment combine with natural features to create the scenes of enclosure (fig. 5, bottom right).

From the "potential action" point of view, the enclosure type of spatial configuration is perhaps the most fascinating of all. Here one is promised a place of respite, a place of relative safety. One is provided with what Appleton (1975) in his perceptive analysis of landscape appreciation has called "refuge." Here, in other words, is an opportunity to escape notice, to see without being seen. Certainly an environment offering such an amenity would be desirable. However, "enclosed" groupings are not uniformly preferred. Some may be visually too unspacious, or lack definition.

Blocked views

The final category of spatial configurations is blocked scenes, where visual access is prevented. There are relatively few instances of these in the example studies. There are four such dimensions, two from the Ulrich roadside study (fig. 6, top), and a heavily forested grouping from the R. Kaplan scenic highway study (fig. 6, bottom). The prairie dimension from the Gallagher naturalized landscape study also falls in this grouping; in this instance the tall prairie grass itself created a perceptually blocked space.

Unlike the "enclosed" settings, the blocked ones prevent visual surveillance. They make it difficult to find a direction in which to proceed. One would expect such settings to be avoided

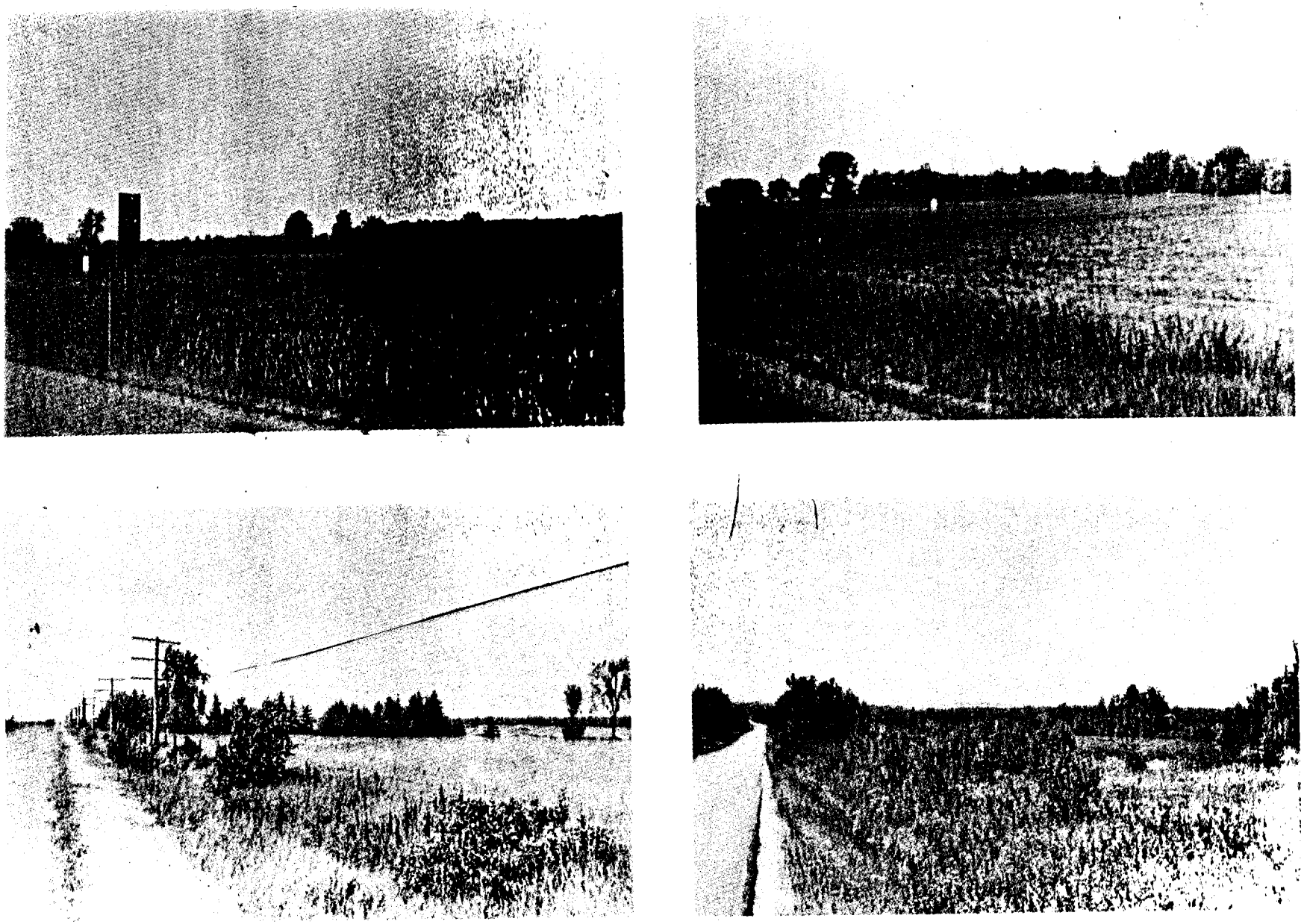


Figure 2.--Examples of open, undefined spaces from the roadside and scenic highway studies.

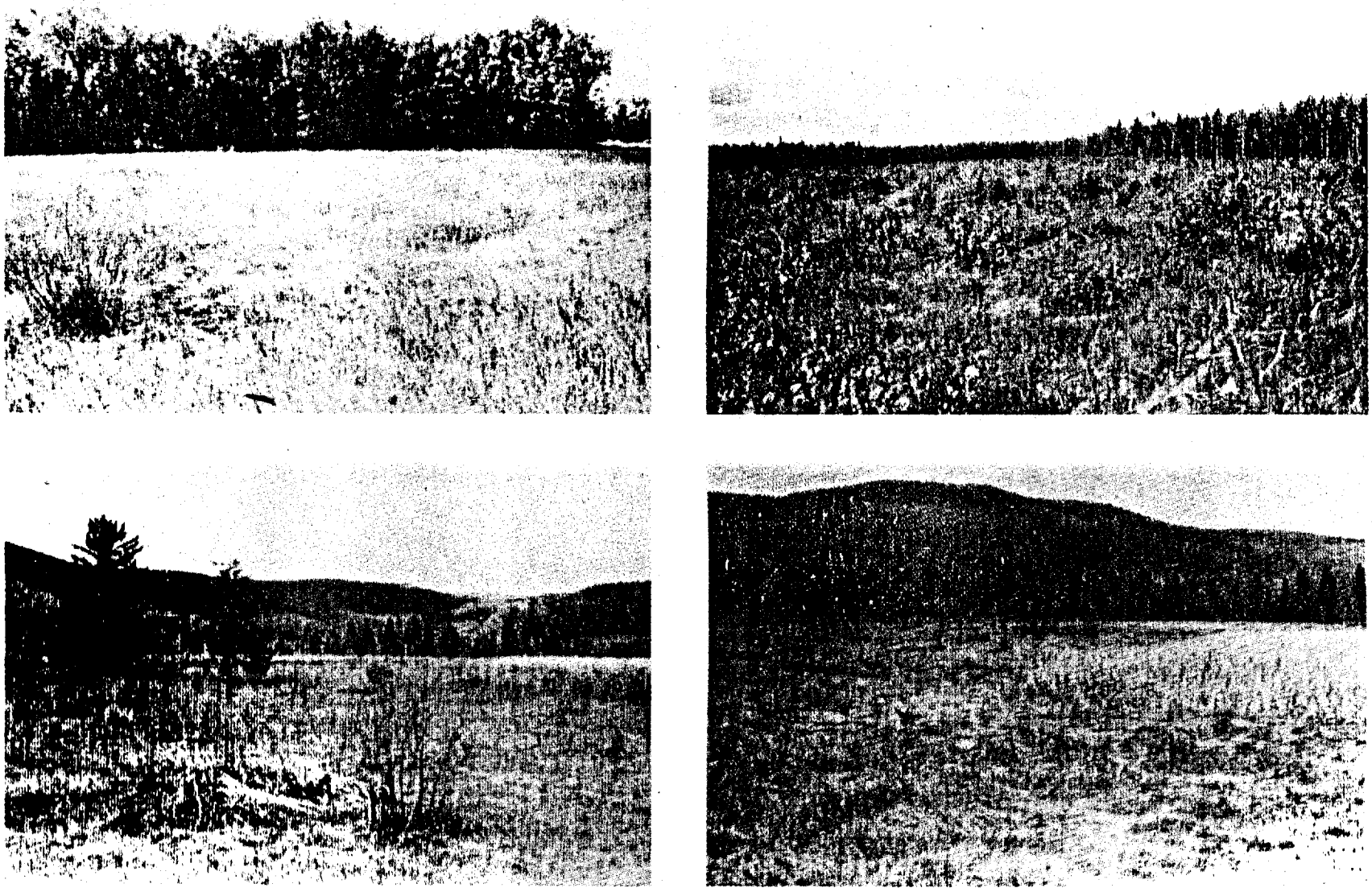


Figure 3.--Examples of open, undefined spaces from the forest practices and bog environment studies.

Figure 4.--Examples of spacious, well structured scenes from three different studies.

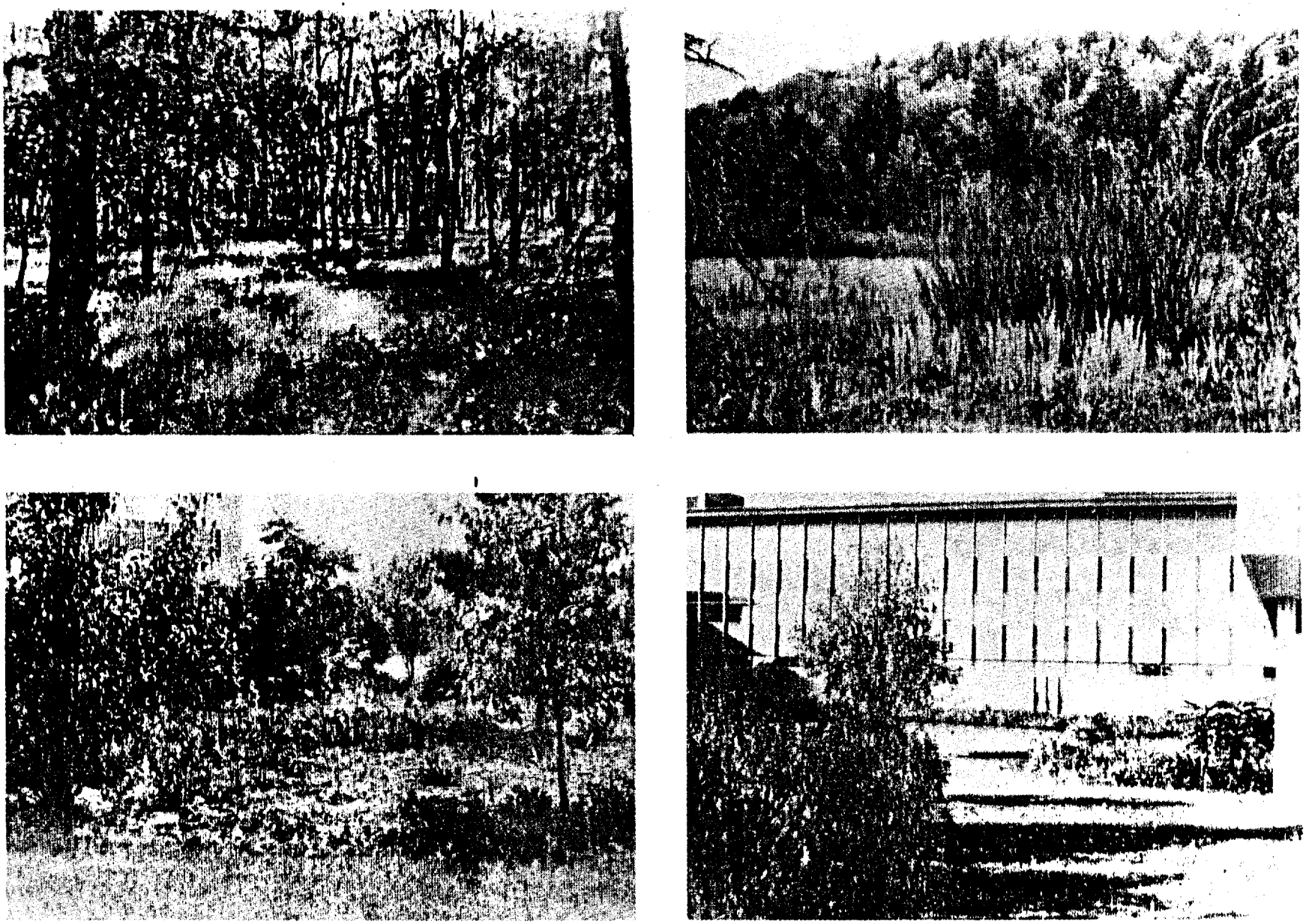


Figure 5.--Examples of enclosed scenes from three different studies.

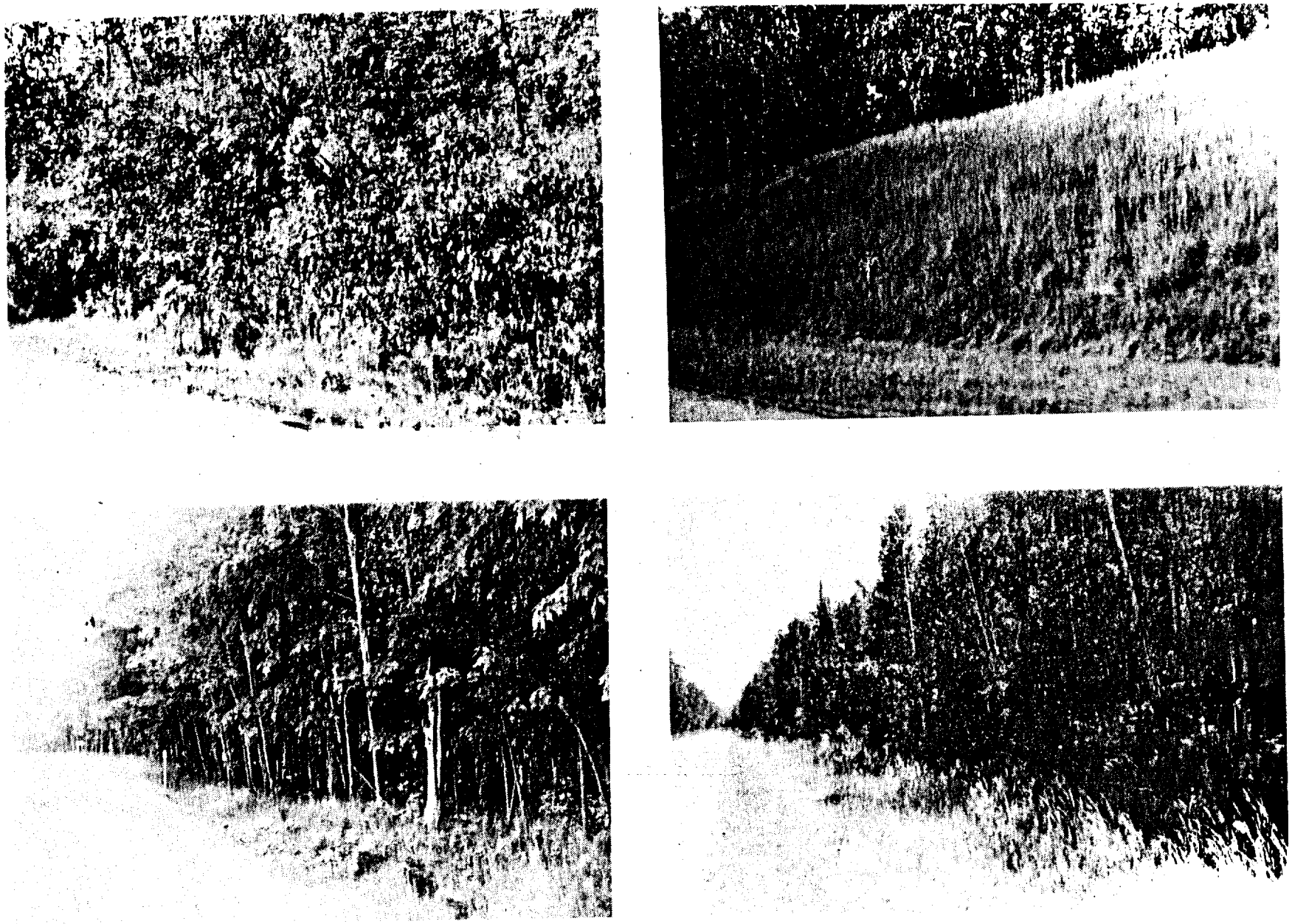


Figure 6.--Examples of blocked views from the roadside and scenic highway studies.

on survival grounds and to be low in preference, as they in fact are.

The powerful role of visual access is strikingly demonstrated by this category of spatial configurations. A setting dominated by tall grass may not actually be impenetrable, but it looks as if it were. The embankment, which is impenetrable -- although one might climb over it -- is reacted to similarly. In addition to not seeing how one would go, and to not being able to visually evaluate the space as a whole, tall grass and rough foliage scenes appear to be even shallower than is in fact the case. Fine textures, near surfaces, by contrast, tend to enhance the sense of depth -- in general, coarse textures are perceived as closer and fine textures as more distant. This is a familiar phenomenon to creators of Japanese gardens and, for that matter, to mowers of American lawns.

SOME REFLECTIONS ON CONTENT

Let us return to the question with which this paper began. What do people find salient in a given scene? What is it that results in a whole group of scenes being responded to in a similar fashion? There are many ways to categorize a particular environment. Use of content-identifying methodologies and preference ratings by untrained participants yields categorizations that are distinctly different from those generated by various professionals. The meaningful groupings identified permit comparisons across diverse studies.

Another interesting property of the groupings is how profoundly informational they have turned out to be. The majority of the expert-generated category systems have little to do with the way people process information. Results of the example studies suggest that what people experience as salient in the landscape involves informational patterns (R. Kaplan 1977b, Kaplan & Kaplan 1978) readily interpretable in terms of requirements for adaptive behavior.

The way space is organized provides information about what one might be able to do in that space. A relatively brief glance at a scene communicates whether there is room to roam or whether one's path is blocked.

Thus, there appears to be both an empirical and a theoretical basis for categorizing landscape scenes. As is often the case with a satisfying research experience, these categories would have been hard to anticipate, but in retrospect make intuitive sense. These findings may also play a useful role in the further development of landscape assessment research. In a recent review, Stokols (1978) argues that generalizing findings across different settings requires a "theoretically based taxonomy of environments." The identification of consistent and interpretable patterns across a variety of different settings constitutes a first step toward developing such a taxomony.

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