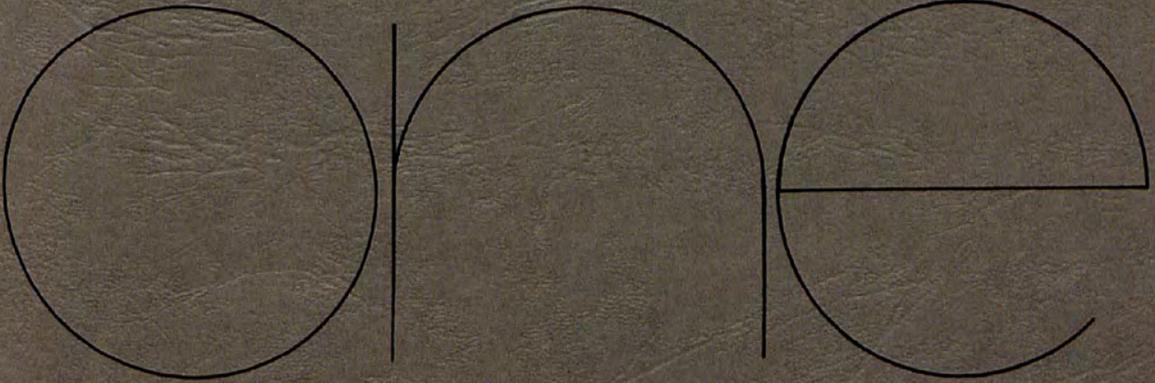
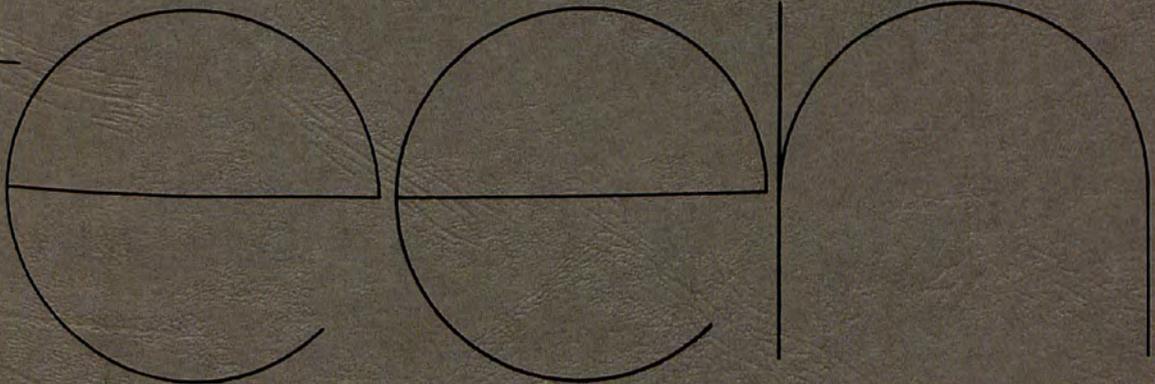


**the student publication
of the school of design**



THE STUDENT PUBLICATION OF THE SCHOOL OF DESIGN

VOLUME 19:1

INTRODUCTION

It has been several years since the Student Publication has presented work done in the School of Design; this issue, devoted to projects undertaken in the context of the School, attempts to sample current involvement. All of the contributors to Volume 19:1 have taught at the School; two are graduates as well. Their interests vary widely, from the conceptual study of environmental design by Vernon Shogren to an examination of perception by Russell Drake. Duncan Stuart and Fred Eichenberger explain and illustrate their process for the mass production of unique items with offset lithography, while Gene Messick's inset folder reflects his experiments with intermedia. Together, these authors represent a portion of the activity of the School of Design; we hope that this publication of their efforts will generate some interest in design-related disciplines.

Marian Scott

Editor

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VERNON SHOGREN, Associate Professor of Architecture in the School of Design, is an architect who has been concerned with design education, the development of visual language, and philosophical inquiry into the basis of design. A recent research project to develop a conceptual model for environmental design has led, in part, to the present paper.

NOTES TOWARD A CONCEPTUAL MODEL OF ENVIRONMENTAL DESIGN

Vernon Shogren

1 It is true, of course, that several claims have been staked in the debate: What is Environmental Design? However, there is no operational field nor funded activity which practices in the name. Rather, there are only gleams in various eyes. Environmental Design is now considered open game, to be seized and codified to suit personal whim.

2 There are *at least* three definitions of Environmental Design which are being currently advocated:

- (1) Design *in* the environment.
- (2) Design *for* the environment.
- (3) Design *of* the environment.

The critical question in any form of design is the source of parameters not of constraints. The first and third of these definitions obviously regard environmental criteria as constraints, and are consequently the same. They are also indistinguishable from traditional approaches to design. Only the second, which accepts environmental criteria as valid parameters, can be regarded as non-traditional in any sense.

3 Immediately at issue is the entire question of physical science, behavioral science, cybernetics, decision theory, information theory, and all similar formalizations of experience. Of what value are they to Environmental Design?

4 A pragmatic activity, such as design, often finds its preoccupations following about one generation behind the human pioneers. The question at issue here involves the same abandonment of transcendental norms which gave rise to the existential and phenomenological schools of thought in the twenties and thirties. The difference lies in the fact that Environmental Design voluntarily abandons such norms, due to disenchantment with the consequences of their enforcement. Consequently, it should be possible to avoid the despair—the “cosmic hypochondria,” as one

What do we mean when we use the term “Environmental Design?”
(1) Or better: Why do we use the term? Why isn’t the simple word “Design” sufficient? Or, *why* was it once sufficient, and is no longer so?

Environmental Design must mean—if it means anything at all—a renewed emphasis on Place, the locality of a locale, the specificity of a situation. It signals the collapse of formalism, of generalized rules of design behavior which are simply adapted to specific occasions. (2)

The significance of the term lies in its implicit rejection of the abstract. Gone are esoteric theories of proportion, harmony, and beauty; concepts of symmetry, balance and order; optimal conditions and standards of achievement. In short, gone are all those universals which were the mainstay of design for thousands of years, which in fact *identified* a work of design as a work of design. (3)

To replace all this, we now have the situation. The situation is *this* one. It is not a kind or type of situation, but *this* one. Within it is found what is needed to know, and within it is judged what is done. All else is abstract, irrelevant, and immaterial.

The fundamental dilemma posed by the idea of Environmental Design is that of nihilism. (4) When all universal standards are considered as empty forms, when the ideas of class and classification are conceived as intellectual games, how are we to measure worth and value? If standards are determinable only within a situation, by what means are we to evaluate the standards? (5)

So long as design was conceived as the specific application of general rules, the primary task of the designer was one of identification. (6) Problems, needs, and goals fell into classes, and could be identified. Solutions also fell into classes, and could be identified. Judgements could then be made on the basis of class criteria and class relationships: *this* kind of thing was the solution to *that* kind of problem. Specifics were, like Platonic 'appearances,' to be ignored. (7)

As soon as we accept the uniqueness of a situation, all this is lost to us. We can no longer refer to this or that kind of situation, but rather to a situation of this kind. (8) The distinction is a subtle one, but extremely important. It involves the expansion of the situation into its own universe of discourse, within which standards of need, value, and purpose can be established.

The basic attitude of Environmental Design is constructive and not adaptive. It entails the rejection of what is ordinarily called knowledge. Knowledge must, in one way or another, be based on the statistical mean. By definition, it rejects the individual case, the very basis of Environmental Design. (9) So long as knowledge is conceived as information about shared properties of anonymous entities, it is of little or no value.

The kind of knowledge that is useful to Environmental Design is not that of things, but of relations of things. (10) Things are of infinite variety, but *relations* are limited and far more stable. They describe the modes of adaptation *between* things, bound by the limits of perception and communication.

writer puts it—which characterized much existentialist thought.

This also refers back to footnote (2). For forty years, we have been aware that the self-sufficiency of *any* axiomatic system is not possible, even including mathematics, the paradigm of paradigms. This makes non-sense of any talk of "designing the total environment." A thing cannot be designed if it is every-thing, simply because our concept of "thing" breaks down. In other words, a thing cannot be conceived as such, without relations to other things. This is the whole idea of Environmental Design.

One does not escape from this dilemma by calling the thing a system, or a structure. These are useful and often necessary ways of looking at a thing; to see it as a system or as a structure is to see the thing with a bias which reveals much otherwise obscured.

To conceive of the total environment as one thing raises the general question of subjectivity and objectivity, and the even more general question of consciousness. We cannot conceive of ourselves *as* selves without the "other," or objective world. Without such a world we would be—in truth—no self. That also would be the fate of a total thing, called all-environment. It would be nothing.

John Dewey: "The naming is the knowing." 6
What we ordinarily call knowing lies in finding a correspondence between a phenomenal occurrence—an occasion of experience—and a pre-existing classification. The occasion is made to correspond to a classificational type, and thereby awarded such predicates (properties) as are considered "proper-to" that type.

Plato believed that phenomenal events within 7
our world of actual experience were but degraded specimens of ideal types, "up there"—somewhere. Design—and much of what we call science, and knowledge in general—follow this dictum.

Design often proceeds on the assumption that only the "idea" is somehow pure and unsullied. The actual world forces "compromise," which is a bad thing. Progression from the idea to the actuality is a history of real or attempted degradation, with the designer as hero, struggling with the forces of evil.

Environmental Design seeks to replace this elaborate myth with one centered on existence. What may be true for another world is no longer considered good enough for this one.

This inevitably brings up the old debate of things-versus-relations. Which are real? as F.H. Bradley asked. So long as the question is phrased in this way, it is a chicken-and-egg controversy.

Things can be considered as entities which we create as focalized patterns of stuff. They are, in a sense, "condensed" out of a flux of events which we experience as sentient beings. After "condensation" the flux remains as ground, contributing as much to the maintenance of things as any predicated attributes of the things themselves.

8 This raises the question of general concepts, and opposed to them, abstract concepts. The word "abstract" has almost passed into limbo, due in part to its being used as a polemical weapon. It is often used to suggest vagueness, immateriality, the unreal, or unsettled. For example: "Design proceeds from the abstract to the concrete." This means, presumably, that the actuality of a designed thing was preceded by a vague *notion* of that thing.

For one reason or another, we seem to fluctuate between considering our world in terms of dichotomy and in terms of polarity. The dichotomy is expressed in pairs such as object-subject, extension-duration, etc. Ultimately it reduces to a grounding in space, and a grounding in time. A thing considered in spatial terms, we call an object; in temporal terms, an activity.

The word "abstract" is opposed etymologically by the word "attract." The common stem is "tract": to take. At-tract is "to take to (oneself)," completely, as is. Abs-tract is "to take away," partially, selectively. An abstract concept is an idea not of a thing, but of some *aspect* of a thing. It is a partial product of analysis.

The polarization vista, suggested by pairs such as mind-body, can be reduced to a viewing of the spatial-temporal flux as either a system, or a structure.

Things within a system are characterized by their connections; in a structure, by their relations. Both are concerned with between-ness or interval, rather than with things as such.

A general concept, on the other hand, is an idea of a thing *as* analyzed. It is not a judgment of what a thing *is*, but of the possibilities as revealed through analysis. In sum, it is a comprehensive view of internal relationships, rather than isolated bits and pieces.

Knowledge of things—which means predicate and verb associations—is for us a rarified and complex game. It has all the gratifying assurance of pinning tails on donkeys. Knowledge of the nature of intervals, of between-ness, is less common. However, our recent concern with polar thought, represented by increasing use of the ideas of system and structure, indicates that the issue is becoming important for us. At the present time, we are just in the process of determining what the terms should mean.

9 The paradigm case of knowledge is that offered by physical science. It is based on "large numbers," and reduces to probability in individual cases. A designer cannot work on the dubious assurances of probability. What is really at stake is the probability of his ever being allowed to design anything again.

At issue is the question of whether we can "know" anything about what we have traditionally called the *ground* of things. Is there, for example, anything we can say about human activities previous to their inception of occurrence. Are they simply random acts of nature? Are there predictable goals which actualize humans in communal patterns, and verifiable rules which are acceptable in organizing such activities? What are the common characteristics of activities as such, by which we *recognize* them?

In Environmental Design, truth is not found by the formula of knowledge: it is not a question of verifiable predicate assertions of things. Rather, it involves matrices of possibilities, of validity of relationship within possible situations. Just as man is not and cannot be determined *as a thing*, so his inter-actions and trans-actions are not determinable as things. However, patterns of possibility can be determined, and things *hypothesized* from these patterns. A particular thing, such as one constructs in design, is then a member of a set of possibilities. It is neither right nor wrong in itself, but simply valid.

Ordinarily, design activity is focalized around a task. This task is given by class identification. It is, for example, to design a chair, a lamp, a house, a car, or whatever.

Three questions are posed by these simple statements. (11)

The questions are:

1. What is it to have? (The set of its physical properties)
2. What is it to do? (The set of its functional properties)
3. What is it to be? (The nature, or thingness)

When we inquire into an existent thing, we do not ask what it is. (12) Rather, we ask what it has, and what it does. The question of what it is, is considered to be meta-physical—beyond physical knowing. And so it may be.

Not so, however, in human undertakings. We must know what a thing is to be, because man-made things have no only existence but purpose and meaning as well. (13) The question then becomes: What *should* it be?

This is in essence a verbal statement: A subject (3) acts (2) and has predicates (1). Ordinarily, (3) and (2) would constitute a subject-verb pair. Design assumes the verb (or function) to be transitive; i.e., wall, separates, people (or activities).

Also, there is suggested a direct, reciprocal relation between verb and predicate; one implies the other. Walls separate because they are extended; and they are extended because they separate. Extension produces separation in time; separation requires extension in space. They are simple correlates of one another.

The model is again in human terms. Agent—transfers power—to object.

12 We cannot ask about the relation or connection of a thing which was not designed by man. Or rather, we cannot be *certain* as to which of our hypotheses is correct, or whether the word "correct" even makes sense. This is simply to say that intention is not a valid predicate of a natural thing.

13 Ecologists make much of "nature's design," but indications point rather to equilibrium than to design. The concepts involved are those of conserving rather than attaining. We expect more of human acts.

14 The logical game is an illusionary refuge when based on universal predicate assumptions. To know that a house is a shelter is not very helpful so long as "shelter" is undefined. And undefined it must be, since it is a question of interpretation—in turn a product of the thing-context relationship. What is shelter in one context may be exposure in another. A designer cannot *tag* his product as being this or that; rather it must be understood as such.

15 Because living is taxing and difficult, we have adopted the doctrine of "principles," and made a virtue out of mechanized behavior. With pride we speak of "acting from principles," which means ignoring a situation by reducing it to a normative type. We substitute dogma for thought, and sanctified routine for response-ability.

How do we ask of a non-existent thing: What should it be? The traditional approach is to choose a category of being. We say: It should be like this one, or that one. Justification comes from rules of evidence, or abstract principles of behavior. The game is logical and syllogistic: All things of this kind should be such and such; this is of the kind; therefore, it should be such and such, etc. (14)

However, in Environmental Design the logic is drawn from the situation. No justification from outside has any bearing or force. Universal principles are anachronisms. (15)

To have meaning in Environmental Design, principles must be drawn from the situation, arguments from the principles and conclusions from the arguments. There can be no escape to universals. The problem is this here, this now, this one.

When we inquire as to things within a situation, we ask three sets of questions: What questions, How questions, and Why questions. (16)

What questions:

1. What it is as a thing.
2. What it has as a thing.
3. What it does as a thing.

Thingness
Properties
Functions

How questions:

1. How it is what it is.
2. How it has what it has.
3. How it does what it does.

Modality
Medium
Method

Why questions:

1. Why it is what it is.
2. Why it has what it has.
3. Why it does what it does.

Relevance
Place
Use

The first question in all three sets is addressed to the existence and meaning of the thing. (17) The second is addressed to the physical properties as known in a spatial context. The third is addressed to functional properties as known in a temporal context.

The questions of primary importance to a situation are those of How and Why; those which refer to the relations a thing would have to the situation considered as a structure, and those which refer to connections a thing would have to the situation considered as system. These are questions of modality and relevance, respectively.

It has been customary to treat these questions as of minor importance. Things, we are told, are not part of situations, but belong to users. Like the What questions addressed to the things themselves, the model is one of simple ownership. (18)

See appendix: Three levels of Thought.

16

When we ask *what* a thing is, we can go on 17
endlessly describing it in terms of properties
and functions. But when we "collectivize" such
description in terms of structure or system,
then we explain. For example: the human body
described bit by bit is a confusing and complex
chaos. Described as structure, it takes on
meaning, but meaning in the sense of modal
possibility. It is a meaning of *signifying* both
internal and external criteria, internal values
and external constraints. Considered as system,
another meaning is suggested; the relevance is
that of *significance* of the whole as unit, its
capabilities and potentialities.

Trigant Burrow studied the source and nature 18
of human conflict for many years. He found it
to center around concepts of ownership. Many
of our value words express the importance that
we give to ownership: property, proper,
propriety; goods, good; rights, right; etc.

Our concept of things is similar to our concept
of self. A thing is "that which underlies and
bears (has) properties." A self is "that which
underlies (subject) and bears predicates." Both
are considered as owning, as being owners.
Behavior (being plus having) is our dynamic
mode, etc.

The user-thing pairing perpetuates this
unfortunate tradition.

The question of "meaning" is a tired one by
now, but it must still arise as long as human
acts are construed to have purpose.

19 The phrase is after A.N. Whitehead: "Knowledge as such is a high abstraction."

20 We are accustomed to believe, in our pragmatic and materialistic society, that the acme of nonsense is represented by a things being "useless." Much of the current criticism of the design professions centers around the relative "usefulness" of what they are doing, as against the more "useful" goals they could be pursuing.

Environmental Design suggests that "use" can only be determined within a system. There are no extrinsic standards of a thing's being "useful." There are no universal criteria of "use," or universal values accrediting "usefulness."

21 Martin Heidegger, in his attempts to find a basis of human being has been forced to retreat to the pre-Socratic Greek thinkers. He finds there, apparently, a counter to the physical universals of modern science. The early Greek thinkers attempted to found general statements from a naive and anthropomorphic view, which Heidegger finds more validly human than the abstract universals of today.

One can trace a steady progression, in our culture, from mythological models of the universe, to physical models, to mathematical models. With the mathematical model, the general nature of things is best captured, but man has disappeared.

In human enterprises, the opposite seems to hold. Projects being with general relationships, progress through physical embodiments, and end as myths. Myths attempt to capture the *how* of occurrence and object, how they are, how they seem, the mode or manner of their being what they are. Myths are perceptual models of what is, not conceptual.

When we ask of a wall: what does it do? We answer: it separates. How does it separate? How does *this* wall separate?

However, the concept of "user" is a high abstraction, of the general order of all classificatory knowledge. (19) Use is a factor issuing from the dynamics of a situation, the temporal or activity aspect. Only because people are part of that situation and participants within it are there users.

There is no way to talk abstractly about use, users, or usefulness. Use simply involves the temporal *role* of a thing, just as place involves the spatial role. It serves to identify, but not to justify. There is no eternal value associated with a thing's being useful. (20)

Use explains functionally in terms of relevance. Method explains functionality in terms of modality; How does it do what it does? For example: If the function of a wall is to separate, *how* it separates would be its method, its manner or mode of carrying out the function. Use would explain *why* it separates, the purpose of such separation. (21)

The most difficult question for Environmental Design concerns that of the inter-relationship of physical properties and place. Designers are accustomed to say that "Form follows Function," (22) or that all physical properties should have use correlates. That such is never the case is quite obvious, but it remains a source of embarrassment. What is to be done about properties whose functions have no use? What to do, for example, about the mass of a refrigerator, or the handle of a hammer between grip and head, etc.

The traditional approach is a typical retreat to abstraction. Rules are formulated to cover the surplus properties, and given the designation of "esthetic." (23) Intensive programs of education are instituted to convince others that the "esthetic" is good, and is to be desired above all things. In this way, solutions are by-passed for ab-solutions.

In other fields the use of the word "esthetic" is much less defensive. It is not used to designate What is done, but rather How. Mathematicians do not speak of esthetic theorems, but of esthetic proofs; writers do not speak of esthetic plots, but of esthetic writing or development of a plot, etc.

How a thing has whatever properties it has is a question of the medium in which it is carried out. How it does whatever it does is a question of the method by which functions are organized. These are the modalities of properties and functions as they are known within a situation.

A scientist would probably give a more general description in response. For example: It separates because people move, and it is a barrier. It separates because the human activity world is basically two-dimensional. This thickness of paper 40 inches in diameter is the human world. A barrier within that thickness would necessarily act to separate. *This* is how the wall separates. But function is not explained by a more general function (activity). *How*, as modality, inquires into the specific manner or way in which the function occurs, not *that* it occurs, or its cause.

A function of animals is that they move. How do they move? The index to James Gray's book, *How Animals Move*, lists the following: swimming, walking, running, jumping, creeping, flapping, flying. In the same way, one could respond to the question: how does a bridge cross a barrier? It may leap, reach, step, straddle, etc. All of these have technical correlates.

How a thing does what it does is one of the degrees of freedom a designer has in responding to a situation. *Why* it does what it does may be identical in any of a dozen different cases, but the issue is hardly settled at that point.

The question of form is one of the many 22 formidable hang-ups which block communication in the design fields. Traditionally, it referred to object shape or appearance. Now, it is used in many fields as a synonym for the organization of any multiplicity, in such manner as to be comprehensible as a whole. In information theory, it is a measure of predictability of complete states from partial states, etc.

There are nine established theories of esthetics, 23 all of which purport to tell what esthetics "is." Most attempt to prove their case on the basis of reason, explaining *why* the esthetic is, in fact, esthetic. Assuming they are all valid, which seems reasonable, how does one explain *how* the events occurred which produced what we characterize as esthetic? Certainly this latter preceded the former.

24 Traditionally, design has proceeded from an exact specification of use and medium as parameters, and place and method as constraints. As a result, functions were determined by use specification; properties by the medium.

How was the medium selected? Generally as a kind of symbolic expression of the use, as it was conceived in a generalized or universalized sense. If a thing was to be used to house governmental facilities, it should have these or those perceptual qualities; therefore, *this* medium seemed appropriate, etc.

Aside from considering the McLuhanesque conflicts of this axis, it would be interesting to consider its opposite: what if place were to determine method? What if *where* a bridge was determined *how* it crossed a barrier?

Just as functions are determined by use, so properties can be determined by place. Physical and functional are inter-dependent; both are dependent on their situation. (24)

Traditionally, design has approached its task in the following way:

1. Needs and constraints are listed in more or less exact fashion.
2. Requirements stemming from such listings are assessed in terms of interactions.
3. An overall form conclusion is imposed on this array, giving what is called a "solution."

Recent methodologies do not vary from this pattern; they simply carry it to prodigious depths of complexity. The mystique of induction and synthesis—that things are given birth by a simple process of accretion—is still maintained.

Environmental Design suggests that this is all wrong, and always has been wrong. Things are not loose confederations of exact components. Rather it is the opposite; elements are given specificity within the exactitude of a thing. A thing is *this* one, not this kind of one. Elements, by themselves, are indeterminate future relations. They gain specification only within the concept of thingness.

A thing is not an object, although it often has an object manifestation. Rather, it is "that which underlies." It can be conceived as both structure and system, insofar as it establishes rules of relationship and connective goals for subsumed elements (or properties).

A thing usually carries both object and activity manifestations; i.e., it has both spatial and temporal existence. It has extension and endures. Also, it is understood by us in both a conceptual (systemic) and perceptual (structural) sense. (25)

A thing, then is known to us in four ways:

1. As concept
2. As percept
3. As object
4. As activity

The word "situation" is simply a larger thing. It is that of which the smaller thing is property and function. As property it is object-related; as function it is activity-connected.

A situation is a thing to a larger situation. Consequently, it can be conceived as standing between the larger and smaller, and serving to relate—connect them. This model carries through at all levels and scales. (26)

Environmental Design contents itself with working at one level above and one level below its point of contact. By this means, its product is integrated within the overall system. This reflects the polarity of Why and How, which in turn correlates with the conceptual and perceptual understanding. Also, this contrasts with design as such, primarily oriented toward synchronization of properties and functions. The contrast is that of the designing *of* things, and designing *for* things (situations). The verbal difference is small, but the existential difference is great indeed.

A conceptual model of a thing suggests its relevance or connection to the system of which it is part. In that sense, it can be defined as "purpose," in the sense of an intended role which it will play in a more general scheme. There is no suggestion here that such a role be slavishly obedient, harmonious, or such. It may well be stubborn, recalcitrant, or rebellious.

Likewise with a perceptual model. It denotes the relation or modality which a thing has (or is to have) within a going structure; *how* it is to be, in whatever pursuant role is indicated.

Conceptual and perceptual models are the two assertions which a designer can make relating physical and functional attributes. Often they are metaphorical in form, since they imply a reciprocal subject-predicate relationship. Example: "A wall is a separator." This could mean that because a thing is called a wall, then it separates; also, because it separates, it is called a wall.

See Appendix II: Conceptual and Perceptual Models.

This raises the question of internal-external and all the complications attached therewith. If internal-external is understood as a polarity, there is no problem. If, however, it is interpreted as a dichotomy—that all must be either inside or outside in some fixed and irrevocable posture—then there is a problem.

The best model is ourselves. We can conceive of our being in the world, in a group, etc., and an instant later reverse the picture. The world, the group, is now within us. From this ambiguity we construct an ego or peripheral boundary, the most defensive of our myths.

Things, to repeat, are modeled on ourselves. The resting point of thing-conception is that of between-ness.

APPENDIX 1

THOUGHT—LEVELS

The three levels of "vertical" thought are ways of asking about a thing. They ask questions of what, why, and how: What, why, and how it is what it is; and what, why and how it does what it does. These are questions regarding the physical and functional properties of the thing, and the relations—connections they have among themselves and to the world.

WHAT—THINKING

We address questions of *what* to the existent, here-and-now thing. We ask what it is, and what it does—in itself and without regard for past or future. The existent is taken as a simple given and examined for its understandable properties. These are abstracted and classified, and the thing is known by simple association. The thing is similar in some respects to this, and in other respects to that, etc. In this way we "sketch," or describe the thing. Listings of such abstract properties are called know-ledge, and can be considered separably from the thing. Such listings are in principle inexhaustable, but the thing remains as "that which underlies."

The word "subject" also means "that which underlies." Subjects have predicates, just as things have attributes. Truth is defined as consisting of statements of predicate-attribution which correspond to experience.

The word "what" is the Anglo-Saxon neuter form of the word "who." In this way we ask very similar questions when we ask: *Who* and *What*. The questions are those of identity.

WHY—THINKING

Just as "what" is the neuter form, so "why" is the *interrogative* form of "who." To ask why is to search for intention, to question relevance, and inquire into meaning and purpose.

We assume that nothing understandable is arbitrary; and that a property has relevance to a thing, and the thing has relevance to the world. This relevance is not something either the thing or the world *has*, but is—in a sense—*between* them. A thing can have a function, but not a use; that is a matter of connection between thing and world.

This is especially true of man-made things. We assume such a thing was intended to be whatever it is, since to do otherwise would be absurd. We ask why it is as it is, and why does it do what it does. We cannot avoid such interpretation, since this is the manner of conceiving the world. (conceive—to take with)

HOW—THINKING

The word "how" is also related to the word "who," and asks in what way or manner, or by what means the thing is and does. It asks about the state, condition, or meaning; not in terms of purpose, but in terms of effect. Properties are related to other properties, and things related to other things. To ask *how* they are so related is different than to ask *why*.

A thing is related to other things in a direct, perceptual way. As soon as it exists, we give it perceptual meaning—determined in large part by the relationship it bears to other existent things. We cannot isolate it from its context, and treat it as a thing apart. It becomes a part of a larger perceptual whole.

The same applies to properties of the thing. They are either successful or unsuccessful insofar as they bear a coordinated relationship corresponding to the general interpretation of the thing. They are not good or bad, right or wrong, in themselves. Such can exist only when considered in isolation and judged by abstract rules.

Why and how; Relevance and Relation

What—thinking is oriented solely toward the thing. Why-thinking is oriented toward purpose and use, and is directed toward consideration of an intentional future. How-thinking is oriented toward mode of being within an existent fabric.

Why and How explain a thing. They do so by relating to the past and connecting to the future; i.e., the on-going and external world. Things cannot exist without such relationships, since they cannot exist in and of themselves.

When we inquire into existing things, we ask such questions as a matter of course. Attributes which a thing has are interpreted both as properties *of* the thing, and as relations-connections *to* the world. Internal and external are thereby united, and the sharp distinction between them erased.

When designing things we proceed in opposite fashion from simple investigation of the existent. We begin by establishing connective and relating patterns, which are then converted into properties. These are in turn organized as internal physical structure and functional system, coordinated with each other to produce one thing.

When we design, we design for and within a situation. Designing-for is relevant; design-within is relational. These two determine the possibilities from which choice can be made. Such choice constitutes either a conceptual or perceptual model for which the final designed thing is a specific case.

APPENDIX 2

CONCEPTUAL AND PERCEPTUAL MODELS

A. We can consider the behavioral evidence of human thought to take the form of four kinds of assertion:

(1) Assertions which *communicate*; or establish or place in common with others some area of discourse (universe of discourse).

(2) Assertions which *inform* or which give form by specifications to something of which a generalized image is held.

(3) Assertions which *express* or make manifest the feelings and subjective responses of someone.

(4) Assertions which *propose* or which advance opinions, judgments, or evaluations of fact or truth or which *authenticate* such statements ("knowledge" statements).

The first three assertions are within the capability of many—if not most—animals. The fourth propositional language as such, is by unanimous agreement exclusive to humans, and is probably the best evidence of what we call conceptual thought.

B. Even though unanimous agreement exists on the point that a propositional language is unique to man, it is not at all clear as to whether such language is dependent on conceptual ability, whether conceptualizing is dependent on conceptual ability, language faculty, or whether both are evidence of some higher mental function unique to man. Since the issue is unresolved, we can only look to the behavioral evidence which exists in the form of language.

The general form of the English language is subject-predicate; something is named and then some property of function is attributed to it. Five examples:

1. The man is tall.
2. The man is a carpenter.
3. The man is black.

4. The man is virtuous.
5. The man is a thief.

Superficially, these five statements all look alike, but this is an illusion. Each can be tested in turn to discover *what we are talking about*, and each will be found different, some subtly, others dramatically.

C. (1) The man is tall.

This is (usually) a simple perceptual observation, and could without violence be recast simply as an adjective and noun: tall-man.

(2) The man is a carpenter.

Here we are attributing a function, or participation within a general activity, rather than a property of the man; i.e., something he can be said to *have*.

(3) The man is black.

At this point, interpretation is ambiguous. We could mean:

a. That blackness is a property to be attributed to the man in the same way as we would attribute tallness, left-handedness, etc.

b. Or, "The man" is a representative (symbol) of a general class.

c. Or, the statement is a metaphor, of the general form; "Abraham Lincoln is a ship's-captain," (Whitman); or "Abraham Lincoln is a pine tree," (Masefield).

The first reading would, again, be perceptual in origin. We could change the form simply to "black-man." the second could also be perceptual if the criteria of classification were simply "blackness," or "black things." But, in effect, "black" is now subject, and "man" is a property attributed to it. Using the previous simplification, the form could now be recast into "man-black" in contrast, perhaps, to "woman-black," or "child-black."

If, previous to such classification, we have a firm idea of *the class itself*, by which members attributed to the class are constituted, we must call this a concept.

(4) The man is virtuous.

This statement could be taken simply as attributing a property or tendency toward acting in a certain manner; or as awarding membership to the class, "virtuous people." However, it is clear that the first would be quite meaningless without a prior *concept* of the

second. Certainly, virtue is not a perceptual observation as such, but is identifiable only by reference to standards established by a concept.

(5) The man is a thief.

Here the subject (man) is clearly converted to a predicate (or property). The man's being a thief has converted him from person to thing, and he is classified as firmly as sorting a potatoe. Perceptual recognition would again be possible when the (rather simple) criteria of class membership were made known. But such criteria depend on a whole string of prior concepts: "Thou shalt not steal;" stealing is taking another's property; property is that which a person owns; ownership is the right of possession; possession is the privilege of capture, etc.

D. Perceptual thought is that which gives us the ability (know-how—to classify. Conceptual thought constructs *the reason why* the classification takes place, or is significant. The statement, "The man is black," would be quite meaningless unless we had previously established a proposition which explained why the color of a man's skin is a significant mode of classification. The point is that a simple assertion of this kind, which sounds communicative and/or informative, is so only when the motive for making it has been established. Concepts assert the *relevance* of the observation. Without concepts, the statement would be simply relational; i.e., the man is darker than, just as we would say taller than, heavier than, etc.

E. When we ask, "What is a city?," we could respond with a purely descriptive statement as to what cities are. On the other hand, we might answer with a statement such as recently made by Christopher Alexander: "A city is a mechanism for sustaining human contact." It is important to recognize that such a statement is not a direct response to the question, but rather a response to the question, "Why is a city?" It is neither informative nor communicative but propositional, and therefore conceptual. It is one hypothesis of the meaning and significance of the classification, "city."

A perceptual hypothesis, on the other hand, would be addressed to another question: "How is a city?" What is its manner or mode of being whatever it is? Clearly, the question concerns the relational structure of elements rather than the relevance or purpose of them.

F. Although we can usually see more possibilities in *how* things are (or could be) than in *why* they are (or could be), this assumption is not justified. For every conceivable how-state there is a corresponding why-state, and vice-versa. The poverty of what-is outcomes is largely due to our lack of diligence in exploring conceptual possibilities, and in constructing perceptual models expressive of them.

This condition might be better approached in future by reversing the procedure: building perceptual possibilities, and constructing conceptual models explanatory of them. Obviously, this cannot be achieved, however, in abstraction from the existent world, for the very mechanism of perception is one based on relationship.

G. It might be asked; why, if this is so, are concepts and conceptual models necessary, or even relevant? Perhaps the best answer is the following: concepts connect events and objects into *overt patterns of meaning*, into systems of purpose ascribed to. Perception is not without meaning, but it is felt, not articulated. Concepts are necessary to give felt experience intelligibility. Whether we call them truths, myths, or fantasies, they seem necessary to tie together scattered fragments of experience into meaningful wholes.

APPENDIX 3

OBJECT AND ACTIVITY MODELS

In contrast to perceptual and conceptual models, which are considered as levels of "vertical" thought, object and activity models are classed as "horizontal" thought. They constitute degrees of *complexity*, whereas the vertical constitutes degrees of *difficulty*.

A *thing*, in Design (or elsewhere) is actually a thing-known. It is our mental image, idea, memory, construct, etc., the result of an intersection of ourselves and the world. Things may be scientific, cultural, social, or personal, depending on the bias and characteristics (factors) chosen to represent some external reality. Their significance consists in their use in relating ourselves and the world, both individually and collectively.

The classic definition of thing is: *A thing is that which underlies and bears properties*. The word "property" suggests "that which is proper to" (some-thing), and can be considered as either static or dynamic; i.e., physical or functional, a spatial property or a temporal property. Physical properties are attributed *to* a thing; functional properties are postulated *of* a thing. These can be considered as characterizing that which a thing *has* (attributes), and that which it *does* (functions).

Ordinary language uses this form, in the sense that predicates assign attributes to the subject, and verbs assign actions (functions).

Example: The man is tall. (attribute)
The man runs. (function)

When we combine these, we say: The tall man runs. The form taken: Attribute—thing (subject)—function.

Both functions and attributes are additive; that is, they can be "summed" into more general collectivities, and reduced to discrete atoms, at will. A movement toward the left (above) sums up adjectival attributes to produce an *object*; a movement to the right sums up functions to produce an activity. Both can be considered as *objective* when the results can be understood in their own right; i.e. independently of the subject, or thing. The School of Design, for example, can be analyzed and understood as a set of physical attributes which comprise a generalized object; on the other hand, it can be understood as a set of functions which comprise a generalized activity. These, in turn, can be added to other objects and activities at N.C.S.U. to produce even more generalized patterns.

"Horizontal" thought is entirely classificatory and descriptive. It relies on known values and known types (archtypes), to which reference is made when making object or activity definition and decision. It is the opposite of "vertical" thought in that it assumes that the overall structure and system, of which it is a part, should be the outcome of itself and other similarly determined things. Just as it (itself) is constructed of many "atomic" judgments so the overall is constructed. The reasoning is similar to that of "states-rights," or local autonomy in government: that those most directly concerned are better able to make sound judgments as to their needs, and that the overall pattern should simply comprise a summation of those decisions. This attitude, essentially a conserving one, tends to balance excesses on the part of generalist thinkers who assume that the part exists *only* for the whole.

The weakness of "horizontal" thought and design stems from its reliance on tradition and the past, which it consciously or unconsciously accepts, and its tendency to indulge in a kind of romantic *automatism* in design procedure. Because existing things can be completely resolved into summative listings of attributes and functions, it is assumed that the opposite procedure is also possible, and valid; i.e., if we can specify each attribute and corresponding function with consideration and care, the resulting collectivity must be a sound one. But this procedure is possibly only if the outcome is *already designed*. Only to the extent that we are willing to accept existing object types and existing activity definitions is it possible to consider "horizontal" design as a satisfactory model of design procedure. Otherwise, it must be considered as "necessary but not sufficient," in the classical phrase. Unless supplemented by "vertical" thought (why and how), it becomes sterile and mechanical, substituting endless complexity for wisdom of purpose. By the same token, "vertical" thought without "horizontal" becomes empty and futile. They are interdependent.

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RUSSELL DRAKE, formerly a teacher of perception and communication in the School of Design, is also a graduate of the School in Product Design. An artist with interests in musical harmony and composition, Eastern art, and the enciphering systems used in allegorical literature, he presents here some of his thoughts on perception and allied problems.

PERCEPTION, RECALL AND COGNITIVE LEVELS

Russell Drake

PERCEPTION

Mullah Nasr Eddin was the most notorious smuggler in Central Asia. His donkey train crossed the frontiers everyday and, though he openly admitted to being a smuggler, the frontier guards found nothing in the baskets but straw. They searched his person, the donkeys' orifices, sifted the straw, soaked it in water which they evaporated looking for residues, and burnt it and condensed the smoke, but found nothing. Meanwhile the smuggler was becoming visibly more prosperous.

Finally he moved to another country to retire. One of the border guards, also retired, met him there years later.

"You can tell me now, Nasr Edin," he said. "Whatever was it that you were smuggling right under our noses all those years?"

"Donkeys," said the Mullah. (12)

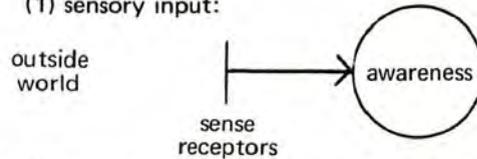
This story illustrates some essential aspects of perception.

"Perception involves an act of categorization...we stimulate an organism with some appropriate input and he responds by referring the input to some class of things or events." (2)

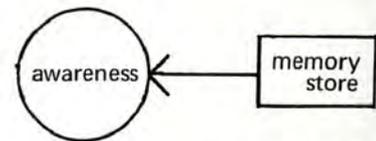
The organism (in this case: border guards) was stimulated by sensory input (donkeys, baskets, straw, etc.), and responded by referring the input to some class of things or events (places for hiding contraband).

Perception, consequently, requires information from *two* sources:

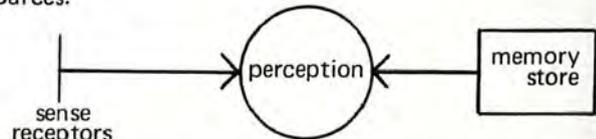
(1) sensory input:



(2) associations from past experience (stored in memory):



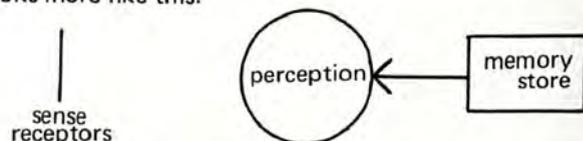
Perception is the *interaction* of information from these two sources:



Incoming sensory data, from present experience is recognized through connection with associations from past experience.

The problem with this interaction, personified by the border guards in the story, is that usually one's associative input interferes with one's sensory input. *Overactive associative input excludes incoming sensory data which do not correspond to the associations.* Important sensory data enters the nervous system but, like the donkeys entering the country, is simply not perceived.

The diagram of one's usual perceptual state consequently looks more like this:



This associative dominance has two major consequences.

This first is that the associative category may not fit the sensory reality. This is called non-veridical perception.

The second is that awareness of the category, even if it happens to correspond to the reality, is still overdominant and is, in effect, mistaken for the reality. Words become more important than the things referred to, and one 'lives in one's head,' disconnected from any experience other than his own associations.

In relation to the design profession, the first consequence—the mis-match of category with sensory cue, or non-veridical perception—may result in problem mis-identification. For example, an architect—like the border guards in the story—will frequently look for a solution to a problem within a certain category (architectural) when the problem itself may exist on a completely different level (e.g. social, legal, educational, etc.).

The second consequence, being unaware of the various levels of one's own experience, leaves the designer in no position to design for the experience of others. He designs environments which nominally satisfy the requirements he is capable of formulating, but which may create an abysmally unsatisfactory experience for the user. He—again like the border guards—completely misses what is essential in the problem.

In addition, the lack of contact with other levels of one's experience produces a lack of contact with the essential sources of one's creativity. This aspect will be discussed later.

The question which arises is: *Can one's perceptual state be improved? And if so, how?*

Bruner, in discussing remedies for non-veridical perception, states:

"... veridical perception ... depends upon a state of perceptual readiness that matches the probability of occurrences of events in the world of the perceiver. This is true, of course, only in a statistical sense. What is most likely to occur is not what will occur, and the perceiver whose readiness is well-matched to the likelihoods of his environment may be duped ... The only assurance against (this) is the maintenance of a flexibility of readiness: an ability to permit one's hypothesis about what it is that is to be perceptually encountered to be easily *infirm*ed by sensory input." (2, my italics)

How can hypotheses be "infirm"ed by sensory input? Unfortunately, Bruner doesn't say.

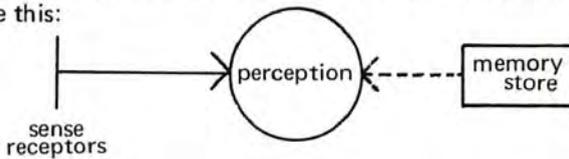
Since having infirm hypotheses to begin with seems sufficiently ludicrous to discredit as a possibility, perhaps one could increase the intensity of sensory input. This requires the creation of specific external conditions (e.g. a sensory overload environment) which may momentarily alter one's perceptual relationship to *that* environment, but which unfortunately will not permanently alter one's normal perceptual relationship to his everyday environment.

The only way this relationship can be changed effectively is *from the inside* of oneself rather than from the outside.

It involves increasing one's *awareness* of sensory input, rather than increasing the input itself.

There are existing techniques for increasing sensory awareness. They are, according to Gunther, exercises "... to quiet the overdominant verbal preoccupation of the mind ... and focus consciousness on direct sensory experience ..." (4)

This would amount to the subordination of categorizing, and other associative activity, to a more dominant awareness of sensory input. In the diagram it would look like this:



Some of the consequences of this shift in awareness are:

One's awareness, rather than being occupied by unnecessary associative activity, would simply have *more room* to perceive more aspects of a stimulus. In laboratory experiments subjects with a high degree of associative interference were found to perceive *fewer* aspects of a stimulus than low interference prone subjects (Klein).

In certain other experiments subjects frequently report the size or shape they *know* a stimulus object *should be* even when this is grossly contradicted by the size or shape it actually appears to be. They are reporting their associative reaction rather than the contradictory experience of present reality. Idries Shah, commenting on the donkey story, states that "... the average person thinks in patterns and cannot accommodate himself to a really different point of view ...". The shift of awareness from the dominance of past experience to that of present experience will admit a stronger impression of the uniqueness of the "here and now" and should permit more reliance on present reality even when aspects of it contradict past conditioning. In other words, one would simply be more *open*. Associative input would be reduced to its useful role of facilitating one's orientation to the "here and now" rather than substituting for it.

Before examining methods for controlling this shift in awareness it is necessary actually to experience the difference between one's awareness being occupied by associations and awareness being occupied by sensory

input. So far we have been thinking about it in the form of theory and diagrams.

It is necessary to understand the actuality of what is involved, rather than just knowing ideas about it.

The following exercise utilizes low threshold levels of sound, which cannot be heard in the presence of associative interference, as a framework for this experience.

Exercise: listening to ambient sounds.

Your mind is usually filled with continuous verbal associations.

The environment is filled with low-level sounds, called ambient noise. This noise (below about 40 dbls.) is usually unnoticed because it isn't loud enough to *attract* your attention away from the associations that normally occupy your mind.

It can be heard.

To hear it, you have intentionally to shift your attention away from your associations onto the sensory reception of sound.

This is an exercise to experience the difference between:

consciousness being occupied by sensory input, and

consciousness being occupied by verbal associations (thinking, verbally recognizing, or daydreaming).

Go somewhere where it's relatively quiet.

Sit or lie down.

Get comfortable.

Close your eyes.

Be quiet. Relax.

Listen: wind blowing, birds singing, distant voices, motors, dogs barking, flies buzzing, etc.

If you identify the sounds, try not to think about them, just listen.

Notice that when you can hear these quiet sounds clearly, the verbal associations in your mind have stopped.

In a few seconds they'll start again.

Notice that when they do, you've stopped hearing.

Listen again.

Notice that when you can hear, you've stopped thinking.

Notice that in a few seconds the associations start again. Then you've stopped hearing.

Listen again.

Etc.

Do this until you clearly *experience* the difference between hearing and thinking.

You can't do both at once.

It should be clear from this exercise that the more you hear, the less you associate. The more you associate, the less you hear.

Increasing perception depends on *decreasing* associations. (Not irrevocably and forever, but simply for as long as you want to perceive something... probably in terms of minutes or even seconds.)

The ability to decrease associations intentionally in order to increase perception depends on the ability to control

your attention: to shift it from associations to incoming stimuli.

There are specific techniques to gain control of your attention.

Before beginning these techniques, it is necessary to know *why* you're doing them. You need to experience the difference between thinking and actually perceiving.

The purpose of the ambient sound exercise is that this difference is immediately made clear. The difference with visual stimuli may not be so clear initially. With your eyes open and light coming in, you tend not to notice that, though you seem to be looking, you're not really *seeing*.

In listening to ambient sounds, either one hears them or one doesn't. The two states of perception and non-perception have a different psychological flavor.

Perception is characterized by:

- (1) relative cessation of associations,
- (2) awareness of sensory input, and
- (3) awareness of the *effort* of controlling your attention which produces (1) and (2).

When the difference in this flavor is recognized, one can understand the need to learn how to make this effort. Perception, in the sense of increased awareness, *doesn't happen by itself*.

By itself, one's attention follows the path of least resistance (or greatest attraction): it follows one's associations (thinking or daydreaming) until a strong enough external stimulus momentarily attracts it.

The recognition of this stimulus produces a new flow of associations which distracts one's attention away from the stimulus back into one's head. Perceiving stops until

another stimulus, or aspect of a stimulus, attracts your attention.

It should be evident that this kind of perception, which recognizes a piece here and a part there, misses quite a bit.

How can one prevent associative distractions from interfering with perception?

One has to be able to *control* one's attention.

In order to control it, it has to be *anchored* somewhere.

Unfortunately, it won't stay anchored on the stimulus—that is, you can't simply 'concentrate' for very long on something external to yourself, because this doesn't reduce associative distractions.

The only place it can be anchored which will reduce this distraction is on the *physical sensation of your body* rather than on an external stimulus.

Paradoxically, in order to increase awareness of something external to yourself, you have to increase your awareness of yourself.

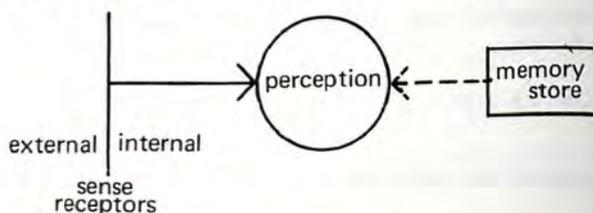
This is the function of certain relaxation techniques. They focus your attention on the physical sensation of your body. Anchoring your attention in your body shifts it away from associative activity, and the resulting physical relaxation directly reduces this activity. It diminishes its distractive power. It opens you up to the reception of sensory impressions.

Thurstone (14) in administering and cross correlating sixty different perceptual and intelligence tests included only *one*, the Two-Hand Coordination Test (13:49), which explicitly required some degree of body awareness. This test was found to be the strongest indication of an ability (called

Factor 'E' by Thurstone) which is clearly related to Bruner's "flexibility" in allowing perceptual hypotheses to be "informed by sensory input."

Witkin found that the extent to which subjects exhibited this "flexibility," which he termed "field independence," was determined by a variety of factors, one of which was "prominence of postural experience" or degree of body awareness. Of these factors, body awareness is the *only one* which is not external to the person himself and is, consequently, the only factor potentially under one's control. (15)

Since the physical sensation of one's body is itself internal sensory data, received by proprioceptors and transmitted via afferent conduction *along with* external sensory data, it would follow that an increase in the awareness of physical sensation should shift perceptual dominance toward sensory input and away from associative input.



Increased awareness of physical sensation results from certain relaxation techniques. Gunther's Sensory Awakening method, for example, begins with a basic relaxation exercise to increase body awareness (4:10). This exercise is similar to those used in Zen, Yoga, and some forms of psychotherapy, for the same purpose.

Relaxation techniques fall generally into two categories.

The first are methods usually connected with hypnosis techniques. They are based on suggestion resulting from the repetition of verbal formulas: "My arm is getting very relaxed. I'm getting very sleepy. Etc."

The problem with this approach is that thinking about relaxing is not relaxation. If I think: "My arm is getting relaxed," it may relax to some extent, but no further.

More successful methods are based on the *direct awareness of the physical sensation of muscular tension*.

Instead of thinking about your arm being relaxed, direct your attention to the actual physical sensation of it. The awareness of the sensation itself will relax it.

"Paradoxically step one in learning how to relax is to become more aware of physical tension... This giving up is not done by avoiding tension but by experiencing it..."
(4:34)

Preliminary Exercise in Relaxation

Try to become aware of the physical sensation of your right arm.

Don't think about your arm. Don't repeat verbal formulas. Don't try and form a mental image of it.

Awareness of your arm happens in your arm, not in your head.

Don't try and create sensation by tightening your muscles. Just become aware of the normal sensation that is always there.

When you become aware of this sensation, *let your arm relax*. Don't try and force it, it will relax by itself. Just try and hold your attention on the sensation.

Notice the similarity with the ambient sound exercise:

when you have a strong awareness of your arm, associations have diminished;

when they start again, you lose the awareness of your arm.

Physical sensation is similar to ambient sounds: it is there all the time but you don't notice it because of mental pre-occupations.

Continue the effort until you clearly experience the difference between sensation and associations. When this is clear, try the following, which is a basic relaxation exercise similar to Gunther's. (4:10)

Basic Relaxation Exercise

Go somewhere where you can be alone in quiet surroundings.

Sit with your back straight, but not rigid (in a straight back chair, on the floor against the wall, on the ground against a tree, etc.).

Get comfortable enough to sit for at least fifteen minutes without moving.

Close your eyes.

Begin with your face.

Concentrate your attention on the physical sensation of your forehead.

Don't try to think words. The words will come, but if you don't pay attention to them, they'll go away.

When you receive a clear impression of the sensation of your forehead, let it relax, and then move your attention down to your eyes.

Hold your attention there until you can feel them relax.

Then your lips.

Chin.

Neck.

Go back and sense your whole face for a few moments.

Then shift your attention to your right shoulder.

Move it slowly down your right arm. (It may feel like water soaking into dry wood.)

Do each section separately: upper arm, forearm, hand, fingers.

Go back and sense the whole arm. Experience the pull of gravity on it.

Then shift your attention to your right hip.

Go slowly down the sections of your leg: thigh, knee, calf, ankle, heel, arch, toes.

Sense your whole right leg.

Then shift your attention to the toes of your left foot.

Come up your left leg the same way you went down your right.

Sense your whole left leg.

Shift your attention to the fingers of your left hand.

Come up your arm, in sections, to the shoulder.

Sense your left arm.

Then shift your attention to the base of your spine.

Then come slowly up your spine, shoulders, neck, back of your head, to your scalp.

Try and sense your whole back.

Then shift your attention to your face as a whole.

Then your whole right arm.

Right leg.

Left leg.

Left arm.

Back.

Then try and sense your whole body at once.

You can't maintain this total sensation for long.

You have to keep your attention *moving*.

Your attention will become distracted by thoughts and fly back into your head like a window shade rolling up.

Let it come down—slowly and gently—into your body.

Circulate it again through the major parts as a whole: right arm, right leg, etc., if you need to.

Then try again to sense your whole body at once.

Become aware of your breathing without trying to manipulate it.

Maintain this awareness for awhile.

Then slowly open your eyes.

This routine is just a suggestion. You can vary the order any way you want.

Try and catch yourself at various times later in the day and contrast the sensation of your body at that time with the memory of the way it felt during the exercise.

Notice that at the moment when you caught yourself, you were not aware of your body.

Body awareness requires an intentional effort.

It doesn't happen by itself.

Episode from the Tale of Janshah:

... Janshah and the merchant fared forth from morning till noon when they reached a lofty mountain to whose height was no limit. The merchant dismounted from off the back of his mule and bade Janshah dismount, whereupon he dismounted. Then the merchant gave Janshah a knife and a rope and said, "I desire of thee that thou slaughter this mule." So Janshah tucked up his garments and, going up to the mule, tied the rope to her legs and threw her to the ground. Then taking the knife, he slaughtered her and skinned her and cut off her head and legs and she became a heap of flesh.

Whereupon said the merchant, "I bid thee slit open her belly and enter therein, and I will sew it up upon thee. Then remain there for a time and whatever thou seest in her belly inform me thereof." So Janshah slit the belly of the mule and entered it. The merchant sewed it up upon him, and withdrawing to a distance, hid himself in the foot of the mountain.

After a time, a huge bird swooped down on the mule and, snatching it up, flew off. It alighted on top of the mountain and would have eaten the carcass, but Janshah, perceiving the bird's intent, slit open the belly of the mule and came forth; whereupon the bird, seeing Janshah, was startled and flew off. (1)

This episode, from a Sufi tale in Arabic, was written as a multi-level communication of aspects of a certain experience.

On one level, the images are allegorical. Entering the carcass of a mule is clearly an image of body awareness: one's awareness entering within one's (otherwise) 'dead' carcass.

Fortunately, for Westerners—who are conditioned to perceive literal meanings—there is a (somewhat) less allegorical level of the story. This level is encoded by means of certain peculiarities of the Arabic language. The mechanism of the code is too complex to explain here, but is described by Shah, and is used by Western scholars to find multiple meanings in Arabic poetry. Briefly, one can, with an Arabic-English dictionary, derive the encoded meanings of the Arabic words directly in English without knowing any more Arabic than how to find the words in a dictionary.

For example, some of the words in the following phrase:

"I bid thee slit her belly and enter therein and I will sew it up . . ."

decode to these concepts (literally quoted from an Arabic-English dictionary):

<i>to penetrate</i>	
<i>to be inside</i>	
<i>to appear</i>	(...her belly)
<i>to bring to light</i>	
<i>internal state of man</i>	
<i>inner part</i>	
<i>hidden part</i>	(and enter)
<i>mind, heart</i>	
<i>penetrating, piercing through</i>	
<i>thick, intense darkness</i>	(and I will sew it up)

The concept is clearly that of penetrating into one's otherwise murky interior and bringing to light one's inner state.

Various aspects and results of body awareness are then developed through the imagery. The aspect of self

perception is explicitly emphasized:

"... and whatever thou seest in her belly
inform me thereof."
to see, to look in a mirror
to show one self (thou seest)

to penetrate
internal state of a man

to know
to be fully aware of
(inform me)

The concept is the ancient one of "know thyself."

In addition to the aspect of self-perception resulting from body awareness, the function of the body as an anchor for one's attention is indicated by the juxtaposition (in Arabic) of the words "mule" and "bird."

"And after a time, descended on the mule a
bird . . ."

to gain mastery over
(the mule)

scattered, dispersed
volatile substance (i.e. attention)
(a bird)

Body awareness is the means for gaining mastery over one's scattered attention.

A variant reading of the word "mule" in the above passage leads into a fuller interpretation of the flight of the bird, carrying Janshah to the top of the mountain, as a religious experience. A bird, allegorically, is usually consciousness—or attention: a rudimentary aspect of consciousness—"scattered, dispersed, volatile substance"—and being carried to the top of a mountain is an image of

consciousness expansion.

As the concept of religious experience is no longer very well understood in the West, the essential ingredient of contact with the "mountain" or one's "inborn, essential nature" (the "highest" part of oneself) can probably best be understood with whatever concepts the reader might have acquired from Eastern literature: such as the *Atman* or "overself" of Hinduism, or the concept of one's "Buddha nature" from Buddhism.

"And after a time, descended upon the mule a
bird huge and snatched it up and flew. Then it
alighted on top of the mountain . . ."

to experience
traces, impressions of
(after a time)

the highest part (descended upon)
(one's Buddha nature)

to rise (sun)
to blaze (fire) (the mule)
to dazzle

volatile substance (a bird)
(Consciousness)

to wonder at the magnitude of (huge)

to ravish the mind (and snatched
to be rapt in ecstasy it up)

volatile substance (and flew)

root, origin, middle of a thing
(Buddha nature) (then it alighted)

*the highest part
(Buddha nature)*

(on top)

*to be clear, evident
inborn, essential nature*

(of the mountain)

The concept of experiencing or receiving a direct impression of one's "inborn, essential nature," with the resultant effects of "wonder" and "ecstasy" is clear. Though a complete religious experience is indicated as the ultimate result of body awareness, this experience lies largely outside the sphere of Western interest. A more moderate degree of consciousness expansion—simply sensory awakening—can result.

"... then it alighted (with the carcass) on top of the mountain and intended to eat it, but felt Janshah the bird . . ."

to be clear, evident

(the mountain)

to look stealthily at

(and intended)

*to be on the watch
to be awake*

(to eat it)

*to wake, to rouse
the five senses
to know
to perceive*

(but felt)

Exercise: connecting body awareness with looking.

Find a quiet place outside, if possible (rather than in a familiar room).

Sit, preferably, before a vast panorama.

Look it over carefully.

Then close your eyes and do the relaxation exercise previously described (or any variation).

When you become aware of your breathing, open your eyes a crack, so that only light comes in.

This will usually shatter the awareness of your breathing.

Try to recover it.

When you do, open your eyes a little further, etc. . . . until they're wide open and you can still maintain the awareness of your breathing.

Look over the panorama again.

Reinforce the awareness of your breathing as necessary.

Try to divide your attention and be aware of both seeing and breathing at the same time.

Compare what you see now with what you saw before.

It may appear as if you're seeing the scene *as if for the first time*.

Try and be aware of your feelings.

Do you feel different? Like *alive*?

Compare this experience with any previous experiences of suddenly seeing something familiar as if for the first time.

Compare this experience with the exercise of listening to ambient sounds. Can you clearly distinguish between being aware of visual input and being occupied by mental activity?

"There is nothing, after all, in the Zen masters *kyogai* (inner state) which differentiates itself as something wondrous or extraordinary. It consists, as in all other cases, in scenting the fragrance of the laurel in bloom and in listening to a bird singing on a spring day to its heart's content. What, however, makes a difference in the case of a Zen master is that he sees the flowers as they really are and not in a *dreamy* sort of way in which the flowers are not real flowers and the rivers are not really flowing rivers."

Can you tell the difference between seeing in a "dreamy," i.e. *associative*, "sort of way," and simply seeing? Do you really *see* a tree? Or do you just *know* it's a tree?

Multi-sensory Exercise

Do the basic relaxation exercise in any environment, interior or exterior, where you can be undisturbed.

Become aware of your breathing (without trying to alter it), or hold your attention on the sensation of some part of your body. (You can't maintain a total sensation of your body for long. You can only do it with a part: breathing, your face, an arm, your feet, etc.)

While maintaining some degree of this sensation, focus on the input of different sensory channels one at a time:

- seeing
- hearing
- smelling
- tactile sensations (of your clothing from the inside, air movement on your skin, etc.)
- temperature

Do the exercise again using a short activity: walk a block, take a bath, get dressed, eat something, etc.

Focus, one by one, on each sense.

You have to perceive systematically, i.e. focus intentionally on one sense at a time. Otherwise, though your threshold of awareness will be lowered through maintaining some form of body sensation, your perception will be dependent on what you happen to notice. *You can't be aware of everything at once.*

RECALL

Zen students are with their masters at least ten years before they presume to teach others. Nan-in was visited by Tenno, who having passed his apprenticeship, had become a teacher. The day happened to be rainy, so Tenno wore wooden clogs and carried an umbrella. After greeting him Nan-in remarked: "I suppose you left your wooden clogs in the vestibule. I want to know if your umbrella is on the right or left side of the clogs."

Tenno, confused, had no instant answer. He realized that he was unable to carry his Zen every minute. He became Nan-in's pupil, and he studied six more years to accomplish his every-minute Zen. (10)

There is another aspect of perception: access to past perceptual experience, or recall.

Recall techniques fall into two categories.

The usual approach is based on verbal associations. (Cf. a very good study by Haber and Erdely: *Emergence and recovery of initially unavailable perceptual material.*) (5)

The problem with this approach is that one doesn't *directly* recall the actual experience, but recalls verbal associations connected with the experience. Actual sensory memory may or may not be connected with these associations, but the point is that it's not the *words* you are concerned with, you want to be able to *re-experience the experience*.

A more direct approach is possible.

Perceptual information, particularly visual, is stored in what is frequently called the *visual motor-system*—not in the verbal memory store. (The motor-system will be discussed in more detail in connection with cognitive processes, but for present purposes: the motor-system is more or less *recognized as being the mechanism of visualization.* (7))

In order to gain access to sensory memory it is necessary to 'think' directly with the motor-system.

This is not as mysterious as it may sound. Try the following exercise.

Exercise: perceptual recall.

Practice this exercise at night when you get into bed. It can be used, however, any time of day.

Relax. Close your eyes, and visualize everything you did during the day, up to that time, *backwards*. That is, start from where you are—in bed for example—and visualize yourself getting into bed in reverse and going backwards to what you did just before you got into bed, what you did before that, where you were before that, where you came from in order to get there, and so on back to when you got out of bed in the morning (which you get back into in reverse).

Don't try and think, "I did this—I did that." The point of doing it backwards is to thwart verbal-logical associations of "I got up—then I brushed my teeth—then I got dressed—then I went out," etc.

Do it visually and rapidly.

If you *keep moving* and don't let yourself become side-tracked by the wealth of detail, or by verbal formulations, *you can recall your whole pathway of movement throughout the day in a few minutes.*

This is thinking with your motor-system.

After clearly experiencing the difference between this kind of thinking and verbal thinking, the next step is to attempt to immerse yourself in the available detail.

The danger is that you'll lapse into uncontrolled associative thinking since, by stopping along the pathway, you lose the movement control that induces visualization. If you suddenly notice that you're thinking about something that happened yesterday, or ten years ago, stop and start over. If this happens too frequently to produce any results, you probably need more experience with the rapid visualization part.

Begin with some degree of physical sensation (either from the whole relaxation exercise or part of it).

Pick some point on the pathway that you want to investigate and try to recall your different sensory impressions *systematically* i.e., one mode at a time (and not just by whatever happens associatively):

What did you see? (Recall visually, not verbally.)

What sounds did you hear? (Not the names of the sounds, but the sounds.)

What did you smell?

What did you touch? (If you touched something with your hand, try and remember how the sensation felt *in your hand*, not in your head.)

Did you taste anything?

What was the temperature? (Not in degrees, how did it *feel*?)

This pathway gives direct access to sensory non-verbal memory. You might be startled, for example, by re-experiencing a smell.

Next, try to recall your postures and movements. Try to recall your emotional state. What thoughts were going through your head?

You can systematically cross-check the impressions received through each sensory channel with each level of internal reaction. You can connect *how* you reacted with *what* you reacted to.

What you might notice in attempting this recall is that your most vivid and complete memories were produced either by some extremely interesting and unexpected circumstances that attracted your attention, or by *your own effort to increase intentionally your perceptual awareness*.

Not surprisingly, increased perception facilitates increased recall.

And vice-versa: what you didn't notice at all, you can't remember at all.

If Tenno, in the Zen story, had simply been aware of himself as he entered the house—rather than worrying about what kind of impression he was going to make on Nan-in—he might have recalled the sensation of his umbrella in one hand or the other, or a visual impression of a wall, clogs, umbrella, etc. As it was, he walked into the house like a sleepwalker. What can you recall of sleep other than dreams?

COGNITIVE LEVELS

Quoth Shahrazad—It hath reached me . . . that after Alaeddin had raised the slab from over the entrance to the hoard there appeared before him a Sardab, a souterrain, whereunto led a case of some twelve stairs and the Maghrabi said, "O Alaeddin, collect thy thoughts and do whatso I bid thee, . . . Go down with all care into yonder vault until thou reach the bottom and there shalt thou find a space divided into four halls and in each of these thou shalt see four golden jars . . . Beware, however, lest thou take aught therefrom or touch them . . . Leave them and fare forwards until thou reach the fourth hall . . . Thou wilt find therein a door . . . enter there through into a garden adorned everywhere with fruit-bearing trees. This thou must traverse by a path . . . beyond which thou wilt come upon an open saloon and therein a ladder . . . And . . . thou shalt find there a lamp hanging from its ceiling; so mount the ladder and take that lamp . . . And on return thou art allowed to pluck from the trees whatso thou pleasest, *for all is thine so long as the lamp is in thy hand . . .*" (3, my italics)

The image of descending into the subterranean chamber is essentially the same as that of Janshah entering the dead carcass: the descent of one's awareness down into one's body, rather than its usual course 'off the top of one's head.'

The lamp is obviously consciousness. It is found in the fourth room. What is in the other three rooms?

Exercise: perception of your internal world.

Do the basic relaxation exercise.

Using a short activity, like eating an orange, brushing your teeth, etc., focus on what is going on *inside* of you instead of outside. Be aware *one at a time* of:

(1) *Your body itself*

What is your body actually doing? How does it feel from the *inside*? How does it move? What muscles become *tense*? How does your face feel from the inside? Etc.

Try to follow your movements with *unbroken attention*. How is your body reacting to, and manipulating, the environment? You may notice that it seems to be constantly making complicated judgments and deductions of distance and forces, that it is *thinking* all the time—not in words like your head—but in its own way. It has its own level of intelligence separate from your head. This is called your motor-system. It thinks in motor-impulses instead of words.

(2) *emotions*

You are usually only aware of the effect your emotions have on your mental associations. ("I feel angry because I'm thinking angry thoughts.") The emotions themselves, however, *originate in your body*. By becoming aware of your body, you can become aware of your emotions.

It may be difficult to connect with them at first. In fact you may not think you even have any. But if you persist, you can begin to notice them. They are a kind of energy that inhabits your body. Each emotion has a different 'flavor.' You might notice that you have several different ones at the same time.

You might notice that your emotions *have their own associations*. They make their own judgments and decisions, have their own memory, draw their own conclusions, etc. You might decide that your emotions, like your body, is a *separate level of intelligence*. It 'thinks' with feelings instead of words or motor-impulses.

(3) *thoughts*

Try to observe what thoughts pop into your head. Try to

observe how they are connected, associatively, with the activity you're engaged in *without becoming lost in them*. That is, try to maintain some form of body awareness and, by just letting the thoughts come and go, try to discover what actually runs through your mind. You might be surprised.

You have to be careful that you don't become lost in these thoughts by losing the awareness of your body. If you do, the experience will degenerate into the usual free-association activity called 'introspection.'

Awareness is different from introspection. Awareness of your associations is different from being drowned in them.

Awareness is different from thinking.

(You may notice that your thoughts contain a mixture of *words and images*. Though the images occur in your head, they are generated by motor-impulses originating in the motor-system.

One can *experience* (if he makes the effort) at least four different kinds or levels of thinking (or of reaction to the environment):

words—a function of the logical mind,

feelings—a function of the emotional system, and

motor-impulses and *images*—both functions of the motor-system.

Charles Rusch has derived five levels of experience from concepts of developmental psychology. Since certain of these levels appear to be functions of others—e.g. the "imaginal" level is a function of the "enactive" or motor level (Hebb is quoted below as theoretical support for this)—his conclusions closely parallel the above experiential conclusions.

The intellect, the emotional system, and the motor system, are *separate cognitive levels*.

The motor-system can perceive data separately from the logical mind, recognize it, process it at tremendous rates of speed, and store it in and retrieve it from its own memory. That is, it perceives, recognizes, thinks, and has its own memory.

It is an autonomous cognitive mechanism.

It thinks in the form of *motor-impulses* and *visual images*.

Motor-impulses are considered by psychologists to *accompany* thought, not to be a separate *form* of thought. The motor-system is still considered to be a 'dumb animal' consisting of learned, reflex, and habitual behavior. Motor thinking is not yet officially included among the "higher mental processes." This is due to the prevailing verbal-logical concept of intelligence. The fact that *one's body understands ideas* has been largely overlooked.

Einstein, however, was quoted as saying that the essential elements of his thinking were not words, but "images and musculature"—both the results of motor activity.

Motor impulses may or may not be accompanied by visual images. The motor system is essentially the *mechanism of visualization*. Its memory is the storehouse of visual experience. It does *visual thinking*.

Hebb has recognized the participation of the motor-system in visualization:

"Activation of the motor-system, overt or implicit (even possibly within the cerebrum alone, with no activity of the final common paths), contributes essentially to the development of visual integration . . ." (7:347)

Clinically, the explanation for the nearly total failure to notice the function of motor-impulses can be found in the work of Wilhelm Reich: the "armoring" produced by habitual muscular tensions prevents the perception of what is going on (or trying to go on) in one's body. (9)

Experientially, however, you can easily become aware of motor-impulses by simply relaxing and becoming aware of your body.

Exercise: becoming aware of motor-impulses.

Do some form of the basic relaxation exercise.

Then *feel* how your *body thinks* these ideas:

push-pull
back-forth
in-out
up-down
etc.

Ignore the words, just let your musculature think.

When you can distinguish clearly the motor activity (the real content of the ideas) from the words (the empty shells of ideas) with these simple examples, and *are able to think the ideas without words at all*, try some more difficult ones:

energy
mass
the speed of light
etc.

Emotions are considered by psychologists as something that influences perception and cognition. There is, however, sufficient evidence available to establish the fact that the emotions also are a separate cognitive mechanism.

Kempler and Weiner in discussing "special perceptual processes which... affect the final perception by regulating or selecting what is to be admitted to awareness," list such "constructs" as "*perceptual defense*," used for 'blocking out' dirty words, "*perception without awareness*," "*subception*," etc.

They state:

"... in all of these formulations two basic assumptions are included: (a) there are at least two relatively independent perceptual systems, a supraliminal process that operates within awareness, and a subliminal process, i.e. 'gating,' 'registration,' 'subception,' which operates outside of awareness; (b) *the latter process is more sensitive, i.e. makes discriminations the subliminal process does not make.* In each of these perceptual formulations it is assumed that the appropriate evaluative reaction to the stimulus is made within the organism while the subject cannot yet discriminate and report the stimulus. Implicitly, therefore, the meaning of the stimulus... is apprehended prior to correct recognition." (8)

That is, "prior to correct recognition" *by the logical mind*. The reported presence of measurably greater autonomic (i.e. *emotional*) activity in the subjects during the 'dirty word' experiments, for example, indicates their *emotional recognition* of the meanings of the words.

The emotional system perceived, recognized, and evaluated the words on the basis of past experience.

The emotional system, like the motor-system, separately perceives, recognizes, thinks, and has its own memory. It 'thinks' about huge quantities of data at tremendous rates of speed, and 'thinks' in the form of 'feelings.' It makes much more subtle discriminations than the logical mind. The results of its processing may become available to the logical mind in the form of *intuition*—for example, in the nearly instantaneous hierarchical evaluation of elements within a complex situation.

The *intellectual* level of thinking requires no argument to substantiate its existence. Everyone knows it is there.

The problem is, it is frequently given credit for doing something it didn't really do. Everyone probably has observed some example of a person trying to justify logically some decision he had *already made* on an emotional level.

The rationalization of motor thinking is not so often observed. The results of high speed motor processing frequently "pop into one's head." If they are even noticed, they are called "insight"—or something equally non-indicative of their origin. If they aren't noticed, they are immediately translated into words without it being observed that the words come *after the fact*—the thinking has already been done. This is inevitable since both the emotions and the motor-system think faster and are usually way ahead of the logical mind.

The virtue of the logical mind actually lies in its slowness: *because of this slowness it is more controllable.*

Control of—or at least access to—motor and emotional processes depends on the development of awareness. Awareness has to be increased and 'quickened' to be able to cope with these more rapid processes.

The human organism is connected to its environment not merely from the standpoint of sensory input, but through the cognitive reactions of these different levels of intelligence.

Rusch points out that ". . . we do not operate on just the intellectual level, but on all levels at all times."

In other cultures, these levels were given separate forms of education. For example, in India:

hatha yoga is for the education of the body,

bakhti yoga is for the education of the emotions,

inana yoga is for the education of the intellect,

raja yoga is for the development of consciousness.

This conception of man as a multi-leveled intelligence appears to be of considerable antiquity. The Sphinx was composed of four animals:

the body of a bull
the legs of a lion
the head of a man
the wings of an eagle.

The bull is the body.
The lion is the emotions.
The man is the intellect.
The eagle is consciousness.

These four levels correspond to the four subterranean rooms in the tale of Aladdin.

Access to the first three rooms is *through the fourth*: consciousness or awareness.

CONCLUSION

This material is the first phase of an attempt to develop a basis for the education of 'non-verbal processes': *perception, recall, body-intelligence, emotional-intelligence, etc.*

The exercises are not necessarily the form in which the material would be taught in class. They are intended to supplement the reader's understanding with the possibility of *experiencing* the ideas, as well as merely thinking about them.

This phase, though developed within the context of a design curriculum, is intentionally unconnected to design in order to maximize its potential relevance to other areas of education.

The next phase (in progress) is concerned with an indication of the relation of various non-verbal abilities to specific design activities (problem recognition, creativity, etc.) and a description of methods suitable to classroom education.

The first phase provides an indication of the general scope of directions and possibilities involved in some form of intentional and systematic education of non-verbal abilities. It is hoped that a relationship will be recognized between these possibilities and the need for the development of forms of education more relevant to human beings than the prevailing ones. This need is being expressed with increasing urgency: students are burning the schools down.

Present educational methods are limited to the development of fractional aspects of human beings.

"... We are developing a very small part of the individual's intellectual potential, or any kind of potential for that matter. This becomes extremely evident when you get into an architectural school which does try to develop some of the less usual parts of your potential. Most of the other disciplines are still playing pretty much the same verbal and numerical games you were taught in elementary school. If you look at a typical elementary school curriculum today, despite all the new methods they have, there is still a concentration on the three Rs. Of these, reading and writing require very similar basic skills. Mathematics adds somewhat to this experience, but there are many levels of experience, and there is no good reason why our educational system can't develop a big proportion of them, if not all."
(11:2, my italics)

"Education is largely verbal education."
(Aldous Huxley)

Mullah Nasr Eddin, ferrying a pedant across a rough piece of water, said something ungrammatical to him.

"Have you never studied grammar?" asked the scholar.

"No."

"Then half your life has been wasted."

A few minutes later Nasr Eddin turned to the passenger. "Have you ever learned to swim?"

"No. Why?"

"Then *all* your life is wasted—we are sinking!"

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THE MASS PRODUCTION OF UNIQUE ITEMS REVISITED

Duncan Stuart and Fred Eichenberger

INTRODUCTION

Many classes of design problems, perhaps most, may be characterized as having a multitude of equally plausible solutions. The notion of "best" solution either is not applicable, or so remote from realization as to be not worth the pursuit.

Techniques presently available, sophisticated as they may be, do not present the designer with a sensual realization of the domain available to his choice mechanism. Our reference here is to the various branches of mathematics which focus on the manipulation of multivariate factors. The output of such mathematics is highly abstract, bare-bones information transmitted in the main to the essentially rational segments of our consciousness.

Our hope is that the studies begun in the project will serve as an aid to presenting the designer with a more direct sensory grab on the domain of choices available to him. We further hope for the entrance of serendipity, perhaps supplying us with a tool honed for tasks as yet only dimly imagined. The results of our project suggest that this has been the case.

OBJECTIVES

1. We wished to exploit the fullest potential of a finite set of input elements under the controlling circumstances of self and system-imposed limitations. We define fullest potential as the completely exhausted set of output elements available from the input elements combined under the imposed restrictions. Left to our traditional,

FOREWARD

The following text is, with some editing, a reprint of a research report, entitled *The Mass Production of Unique Items*, that was published in a limited edition of 100 by the Design Research Laboratory of the School of Design in September, 1968. The original study produced a set of 1752 unique items by means of photographic offset-lithography. This large group of similar but not identical prints resulted from printing and overprinting 12 images and three colors within the context of certain constraints. This paper describes the system which produced that set.

The exigencies of commercial printing, plus the vast number of one-of-a-kind items that would have been required to insure uniqueness, made it impossible for us to duplicate the original study. In the simulation we designed for this publication, there are 72 different prints each of which is repeated 250 times. Each copy of the magazine contains a set of prints which illustrate the process and represent a portion of that set of 72. While the items themselves are not unique (each has 249 identical brothers somewhere in the world) the sets are. No two are identical. The production history of the set of 72 is described in an afterword to this article.

essentially handicraft production techniques, the number of images either of us could have produced would have been limited in number and, we believe, merely extensions of already formed and partially ossified sensibilities. The replacement of handicrafts with a system and the appropriate machinery allowed us to produce an unedited, non-subjectified group which contained anything we or anyone else might have accomplished by traditional means.

2. We have developed strategies by which equipment designed primarily to produce many faithful duplicates of a prototype may be employed in the production of unique items. Our employment of offset duplicating equipment stemmed from both desire and happenstance. Such equipment is readily available, not only to us, but also most probably to other designers as well. We viewed it as a particularized example of many similar mass production systems. The methods we propose would adapt themselves to a wide variety of production situations. This latter statement is prompted by having been made aware, after completion of the set, that it had been produced with ease and simplicity. This, together with the obvious visual richness of the results, convinced us that our methods have application to many areas of design activity.

3. We further wished to consider the possibility of developing out of these efforts a method or methods by which complex design problems could be encoded and produced graphically, then studied visually for significant patterns among their possible permutations and combinations. Should this end be even partially attained, we would be able to offer a useful addition to the growing family of design methodologies.

OPERATIONS

1. INPUTS. A. Six images taken from a group of studies in mosaic transformation by Stuart. These six images were reproduced in positive and negative form yielding 12 images in all. (See Appendix 1.)

B. Three printing inks (yellow, blue, red) were chosen to yield a relatively complete spectrum through overprinting. Spectral approximation was not sought since the need to maintain true color identity against white paper would not have been possible in the case of process yellow.

2. COMBINATORIAL RULES. A. No image may appear more than once in any final print; B. No color may appear more than once in any final print; C. All combinations of 2 and 3 images and colors must be generated; D. No image may change orientation. These rules were selected, in part arbitrarily, from a larger group of possibilities. Had we chosen a different set, the character and quantity of images would have changed. For example, the introduction of asymmetric images to assume different orientations would have greatly increased the number of final images.

3. PRESSWORK. The mechanics of offset duplicator makes plate (image) change a simple operation, while ink (color) change is considerably more difficult and time consuming. For this set, we needed to change the ink only three times and the plates only 34 times in the course of producing 1752 unique images. This procedure and that of collation are detailed in Appendices 1 and 2.

4. COLLATION. The most complex and significant task in this operation is that of organizing the schedule of printing in such a way that the unique

images are efficiently produced. This task is one of, first, introducing into the duplicator appropriate-sized bundles of paper, properly oriented; second, taking the papers (or other surfaces) so printed and rearranging them in a manner appropriate to the next stage of the printing operations. This operation, which we call collation will vary with the type of printing device and the type or types of surfaces which receive the printed images. The collation scheme appropriate to this study is shown in Appendix 2.

orientation with respect to other input images, i.e., what is designated as top for each image must remain constant throughout the operation.

2. None of the input images may appear more than once in any output image.

3. None of the input colors may appear more than once in any output image.

4. The set of output images must exhaust the possibilities defined by the restrictions. Such exhaustion must be executed with an efficient investment of effort, both from personnel and equipment.

APPENDIX 1

The input of this study consists of 12 related visual images and three colors which are brought together under certain rules of combination. These entities achieve physical form by being printed and overprinted on a standard paper by a standard offset duplicator. The output of this study is the complete set of possible prints obtainable through the use of the input entities. The mechanism with which we are presently concerned is to structure the operations in such a manner as to demonstrably achieve the desired output in the most economical manner.

We have made a simplifying assumption for this project that the colors employed are commutative; that is, the order in which they are used in no way significantly affects the output. The first color printed over the second color is considered to be identical in effect to that of the second color over the first, and so on. Clearly this assumption is not justified to the degree that the opacity of any color masks the appearance of a color lying beneath it. However, the colors chosen are deemed sufficiently transparent that we have felt them to be commutative enough for our purposes. A preliminary examination of the non-commutative case is contained in Appendix 3.

An output image is any one of the input images printed in any one of the input colors, or, any possible combination of input images printed in any possible combination of input colors. Such combinations are governed by the following constraints:

Let us now examine the input elements with a view to determining the nature of the expected output. We have available to us 12 images, I_1 thru I_{12} , and three colors, C_1 , C_2 , C_3 . We will begin with an examination of the color variance.

1. None of the input images may change

Let us denote the color domain available to us with the letter C. To this we will append a parenthetical

subscript (N) denoting how many at a time of these colors we are using. Thus, C_N , would denote Nth color in the domain, while $C_{(N)}$ would denote the simultaneous employment of the colors (N) at one time. If there are two colors available, A and B, we could examine their possibilities by employing diagram 1; diagram 2 denotes the possibilities for three colors, A, B, and C.

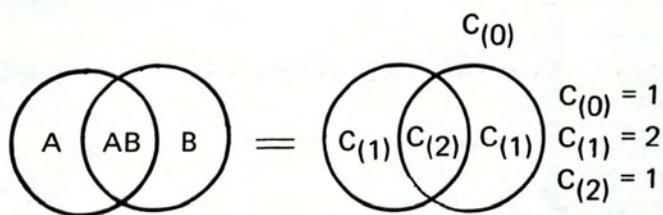


DIAGRAM 1

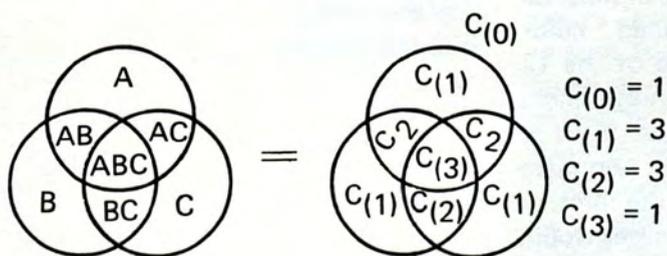


DIAGRAM 2

As we allow the number of available colors to increase, such diagrams become more difficult to draw and even more difficult to evaluate. The values for $C_{(N)}$ may be defined much more simply by resorting to an historic figure known to us as Pascal's Triangle. The contents of a portion of this triangle are contained in the following diagram:

$C \backslash N$	0	1	2	3	4	5	6	7	8	9	10	11	12
0	1												
1	1	1											
2	1	2	1										
3	1	3	3	1									
4	1	4	6	4	1								
5	1	5	10	10	5	1							
6	1	6	15	20	15	6	1						
7	1	7	21	35	35	21	7	1					
8	1	8	28	56	70	56	28	8	1				
9	1	9	36	84	126	126	84	36	9	1			
10	1	10	45	120	210	252	210	120	45	10	1		
11	1	11	55	165	330	462	462	330	165	55	11	1	
12	1	12	66	220	495	792	924	792	495	220	66	12	1

Let us now turn to the 12 images, I , which must be combined with the above defined color relationships. If we start with any one of the 12 images and superpose on it a second image, there are $(I-1)$ or (11) choices available to us. If we in turn superpose a third image on the first two there are $(I-2)$ choices available. Thus for our present problem, the exhausted set of output images would be

$$\begin{aligned}
 (C_{(1)} \times I) &= 36 \text{ 1 image at a time} \\
 (C_{(2)} \times I)(I-1) &= 396 \text{ 2 images at a time} \\
 (C_{(3)} \times I)(I-1)(I-2) &= \underline{1320} \text{ 3 images at a time} \\
 &= 1752 \text{ Unique items}
 \end{aligned}$$

More generally, the total would be

$$(C_{(1)} + (C_{(2)}^l)(l-1) + \dots + (C_{(N)}^l)(l-1)(l-2) \dots (l-N))$$

Where N= the total number of colors available, with the further restriction that $l \geq N$.

If we increased the number of colors until they were equal to the number of input images, the number of possible unique output images would be as shown in the following tables:

INPUT COLORS	UNIQUE OUTPUT IMAGES
1	12
2	156
3	1,752
4	18,000
5	169,000
6	1,442,172
7	11,109,336
8	82,404,032
9	436,630,860
10	2,581,284,540
11	12,549,995,964
12	53,893,291,200

Similarly, if we allow ourselves up to 12 different colors as inputs, but permit ourselves to employ them at most, say, three at a time, the total number of unique images would be as follows.

Total output images, colors taken at no more than three at a time:

INPUT COLORS	UNIQUE OUTPUT IMAGES
1	12
2	156
3	1,752
4	6,120
5	15,120
6	28,452
7	49,056
8	77,712
9	116,740
10	164,460
11	225,192
12	299,256

From the foregoing tables it may be seen that for colors less in quantity than three the number of unique output images is insufficient in number to allow an observer to get an adequate feel of the extent of the inherent possibilities. On the other hand if we go beyond three for our quantity of colors available, we are presented with what we have felt to be an excessive number of unique output elements with which to reckon. Of course, it would be possible to cut down on the number of images. We have not wanted to resort to this stratagem because the images in a sense are our primary information carrying elements, the colors serving essentially as a means of establishing a coding device allowing us to mix classes of information without undue loss of differentiation.

APPENDIX 2

The following will serve as a history of the present project and a set of more or less explicit instructions for carrying out the printing of the 1752 unique final images obtainable from the given input images and colors. The combinatorial rules for these operations have been detailed in Appendix 1.

The images used in this study grew from investigations into the field of transformative geometry carried out over the past several years (Stuart) at North Carolina State University. The specific images were taken from a larger group prepared in the winter and spring of 1966-67. At that time it was felt that these studies would be much enhanced by some variety of color coding as a means of superposing images with reasonable maintainence of clarity. Eichenberger's previous experiments in offset lithography offered basic organizational and technical capabilities permitting the execution of this intent. Most of the work for this study was accomplished during the latter part of January and the early part of February, 1968.

The remainder of this appendix concerns itself with a set of instructions for carrying out the printing of 1752 final images obtained in this study. These instructions are adapted to the use of photo-offset duplication equipment. Had other equipment been employed, it is likely that other patterns of instructions would have been devised.

The offset duplicating press is so constituted that changing images or plates is comparatively simple while changing ink color necessitates a much more complex set of operations. Efficient use of this tool requires that operations be designed to

minimize color changes as a first order requirement and to minimize plate changes as a second order requirement.

We found that so long as color is considered to be commutative, if there are C colors to be used, one never needs to change color more than C times in the press. If there are P plates to be printed, then the minimum number of plate changes would be $CP - (C - 1) = 34$.

Our next question is, how many of each image appears in each of the three colors? From Appendix 1 we have seen that there are 36 possible one-at-a-time images, 1 of which is a single image in one of the three colors. There are 396 two-at-a-time images, 2/3 of which will contain the same color and 22 of these would contain the same plate.

There are 1320 three-at-a-time images, 110 of which would contain the same plate. Therefore, the number of copies of a single image and a single color would be $1 + 22 + 110 = 133$.

To describe more clearly the ordering of colors and plates through our press, the following instructions have been devised:

Given:

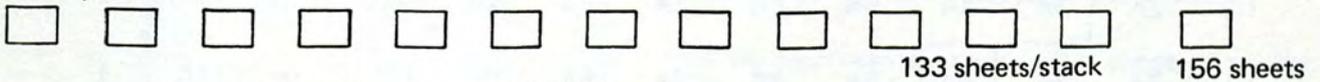
Colors—A, B, C

Plates—1, 2, 3 12

Paper—1752 sheets

1. Fasten Plate 1 in press and charge with Color A.

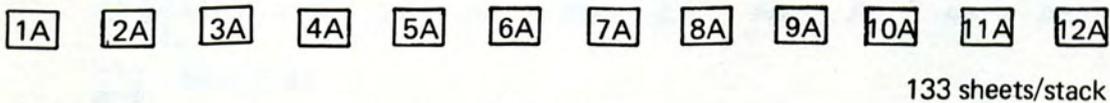
2. Divide the stack of 1752 sheets of paper into 13 smaller stacks. Twelve of these stacks will contain 133 sheets each. The thirteenth stack contains the remainder of 156 sheets. These will be introduced in later operations.



3. Print Stack(s) 1 with Plate(s) 1 and Color A

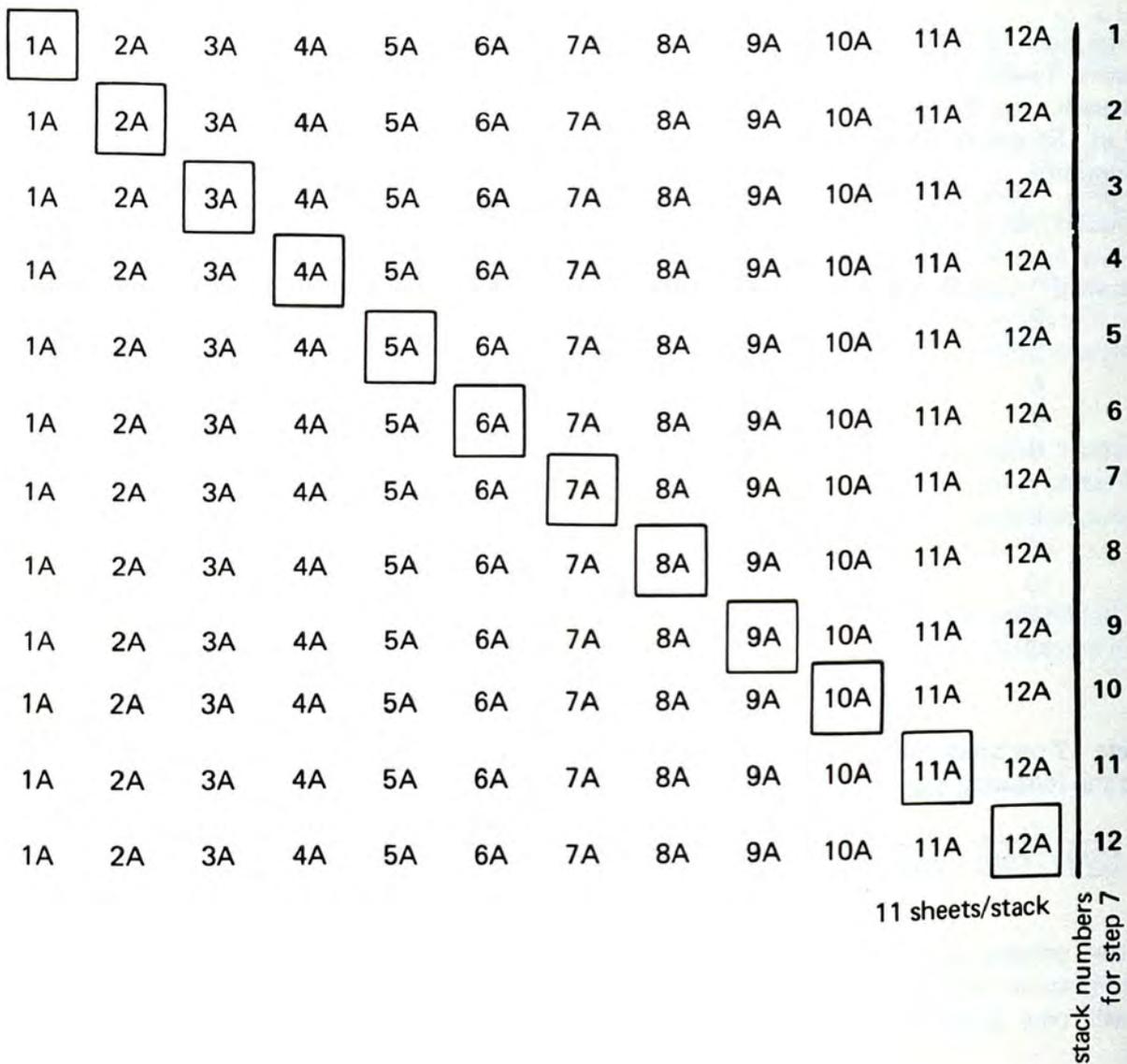
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12

Leave Plate 12 on press and clean out Color A. We now have the following stacks:



4. Take one printed sheet from each of these 12 stacks and place in finished copy storage. Finished storage will now contain 12 sheets of finished material.

5. The placing of one printed sheet from each stack produced by Step 4 into finished storage leaves 132 sheets remainder in each stack. These stacks must now be divided into 144 stacks of 11 sheets each as shown in the next diagram.



6. Remove the printed stacks 1A 2A 3A....12A which are outlined heavily in diagram of Step 5 and substitute in each place a stack of 12 fresh sheets from the remainder of 156 sheets from Step 2. The remainder stack will now contain 12 sheets of unprinted paper. The sheets removed in this step will be set aside to be used when Color C is introduced into the process.

7. We must now form 12 new stacks for the next stage in the printing process. Referring again to the diagram for Step 5, we now form the 12 new stacks by picking up the top horizontal row and labeling it Stack 1. The second horizontal row is treated similarly and labeled Stack 2. The remaining 10 horizontal rows are picked up sequentially and are similarly labeled.

8. Plate 12 is still on the press which we now charge with Color B.

9. Print Stack(s) 12 with Plate(s)	12 and Color B
11	11
10	10
9	9
8	8
7	7
6	6
5	5
4	4
3	3
2	2
1	1

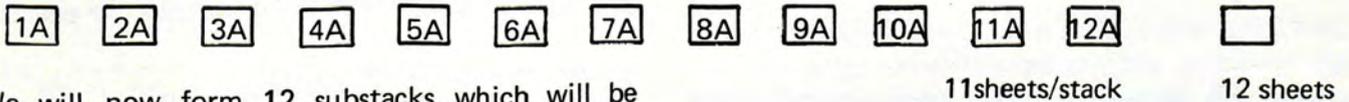
Leave Plate 1 on press and clean out Color B.

10. We must rearrange our various sheets of printed and unprinted paper to, first, remove material to be placed in finished storage, and second, to form our final 12 stacks of material to be printed with Color C. Let us take the stacks which have resulted from Step 9 and arrange them as follows:

C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1		
1A	1B	R1											
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B			
2A	R2												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
3A	R3												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
4A	R4												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
5A	R5												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
6A	R6												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
7A	R7												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
8A	R8												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
9A	R9												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
10A	R10												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
11A	R11												
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		
12B	12A	R12											
	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B		

The 12 heavily outlined stacks in this array each contain 12 sheets. The remaining 132 stacks contain 11 sheets each. Remove one sheet from each of these 144 stacks and place them in finished material storage which will now contain 156 pieces of material.

11. Take the remainder stack of 12 imprinted sheets and printed sheets we set aside in Step 6. Make an array of these as follows:



We will now form 12 substacks which will be added to the stacks to be formed from the array made in Step 10. To form these substacks we perform the following operation: Substack 1 is formed by taking one unprinted sheet and one from every other stack except Stack 1A. Substack 2 is formed by taking one unprinted sheet and one sheet from every other stack except Stack 2A. This process is continued until the twelfth substack, which is formed by taking the last unprinted sheet and one sheet from every stack except 12A. These are set aside and labeled as indicated. Each of these substacks will contain 12 sheets.

12. To form the final 12 stacks we now refer to the diagram in Step 10. Final Stack 1 is formed by taking 1 sheet from each of the stacks in this diagram except from those stacks in Row 1 (R1) or Column 1 (C1). To this stack is added Substack 1 from Step 11. Final Stack 2 is formed by taking one sheet from each stack except those in Row 2 (R2) on Column 2 (C2). To this is added Substack 2 from Step 11. The remaining 10 stacks are formed in similar fashion.

13. Plate 1 is in the press and is now charged with Color C.

14. Print Stack(s) 1 with Plate(s) 1 and Color C	
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12

All of this material may now be placed in finished storage which should at this point contain 1752 pieces of finished material, and the set of possible images is exhausted.

APPENDIX 3

In Appendix 2 we show the structural patterns involved in carrying out the matrix of possibilities under the assumption that the colors could be considered commutative. The color sample tests, however, show that such commutative properties are not, in fact, precisely obtainable within the limitations of the chosen medium.

In this Appendix we examine the patterns involved in carrying out a matrix of possibilities in which the color is held to be non-commutative. This is a much more complex operation and we have, for this reason, greatly reduced the number of input variables.

Given:

Colors—A, B, C
Plates—1, 2, 3, 4
Paper—228 sheets

That there are 228 possibilities in this matrix may be seen from the following arguments.

The commutative case would have the following possibilities (See Appendix 1):

Single color possibilities $C_{(1)}N$	=12
Double color possibilities $C_{(2)}N(N-1)$	=36
Triple color possibilities $C_{(3)}N(N-1)(N-2)$	=24
	<hr/>
	72

The possibilities increase in the non-commutative case by a factor of $r!$, where r is the number of colors being used in a particular image group, i.e.,

$r=1.....r![C_{(1)}N]$	=12
$r=2.....r![C_{(2)}N(N-1)]$	=72
$r=3.....r![C_{(3)}N(N-1)(N-2)]$	=144
	<hr/>
	228

The above tells us how many final elements there will be in the set, but it tells us little about how we should schedule our operations to produce them.

We had planned to include the printing schedule by which the set of 228 unique, non-commutative items could be produced but we ran afoul of our budget and space allotments. Suffice it to say, it would be a vastly more complex operation (Example: the complete run would require 34 ink changes.) than that which produced the commutative set.

Even in the face of such complexities, the authors believe that such non-commutative operations are much more likely to produce elements nearer to those choice mechanisms which we view as being of human origin. The cybernetically aided designer might well consider such a course of action in future times. His position would be that of initiator of basic programs and adjudicator of appropriate output patterns, the grinding operations being carried on largely by mechanical devices such as those we have employed.

AFTERWORD BY FRED EICHENBERGER

When Marian Scott, the editor of this issue of the Student Publication, approached me about a year ago with the notion of redoing the unique items experiment, my enthusiasm was something less than overwhelming. In the first place, I do not enjoy replowing old ground, and in the second, the thought of processing 14,400 different things (the number it would take to insure true uniqueness for this edition of 1,200 copies) temporarily scrambled whatever was left of my mind.

However, the possibility of achieving a wider circulation was sufficiently intriguing that, despite my misgivings, I consented to proceed, and now that it is complete, I'm glad I did. The differences between this and the original effort made it essentially a new thing with its own special problems to solve.

The work was done commercially—rather effortlessly, I might add, except for one press breakdown—proving to my satisfaction that, should anyone be interested, this process has applications in the real world. Rather than attempting uniqueness in the prints (there are 72 different prints, each in an edition of 250) we have accomplished that in the collation of the sets of 12. No two sets are identical, although the variance between many is no more than one print.

The real excitement in this project lies at the head of the press. You may have a fair idea how the final combinations are going to look, but you're not really sure. Out they come—1, 2, or 250 at a time depending upon how many of each you're printing—some exciting, some disappointing, but all different. And when it's all over you know, as surely as you've known anything, that, if you've played the game according to the rules, you've gotten all there is and there isn't anymore. In a world of uncertainties, this at least is a small comfort.

OPERATIONS

INPUT IMAGES. We used four images based upon a deliberately banal, simplistic geometry in order to minimize ambiguity. Each image was assigned a number, 1 through 4. It is possible, with some small effort, to "read" each of the images in any of the combinations.

INPUT COLORS. Yellow, blue, and red, in that printing order, were chosen to insure maximum spectral diversity. (Had I to do it again, I would have chosen a stronger yellow to yield better oranges.)

COMBINATORIAL RULES. 1. No input image may appear more than once in any output print. 2. No color may be used more than once in any output print. 3. There may be no changes in orientation to any of the input images; what is top must so remain. 4. The set of output prints must exhaust the possibilities as defined herein. The set includes 12 one-image-at-a-time prints, 36 two-images-at-a-time prints, and 24 three-images-at-a-time prints.

PRESSWORK. There were three ink changes. The printing order, in terms of colors and plates, was yellow 1, 2, 3, 4; blue 4, 3, 2, 1; red 1, 2, 3, 4. The numerical key in the lower left corner of each print gives its lineage. For example, a blue 1, a yellow 3, and a red 4 indicate that plate 3 was first printed in yellow. From there it went to the blue 1 and the red 4 printings to achieve its final form.

COLLATION. Chart A illustrates a portion of the printing and collating schedule. Two typical cases are shown, the complete yellow run, and a complete run for one of the four images printed in blue. The column headed "Image Y(ellow), B(lue), R(ed)," indicates what color is to be laid down on which image during the particular operation. The image number which is receiving the color is boxed. "Total quantity" refers to the number of sheets printed while "Goes to and amount" refers to the number of sheets reserved for future operations. The underlined number-letter combinations in the latter column refer to the image and color to be added.

FINAL COLLATION. Chart B illustrates the procedure by which the final sets of 12 that accompany each magazine were achieved. (It shows only 32 items and seven sorts because, like Chart A, it would have consumed an inordinate amount of space had it been reproduced in its entirety.)

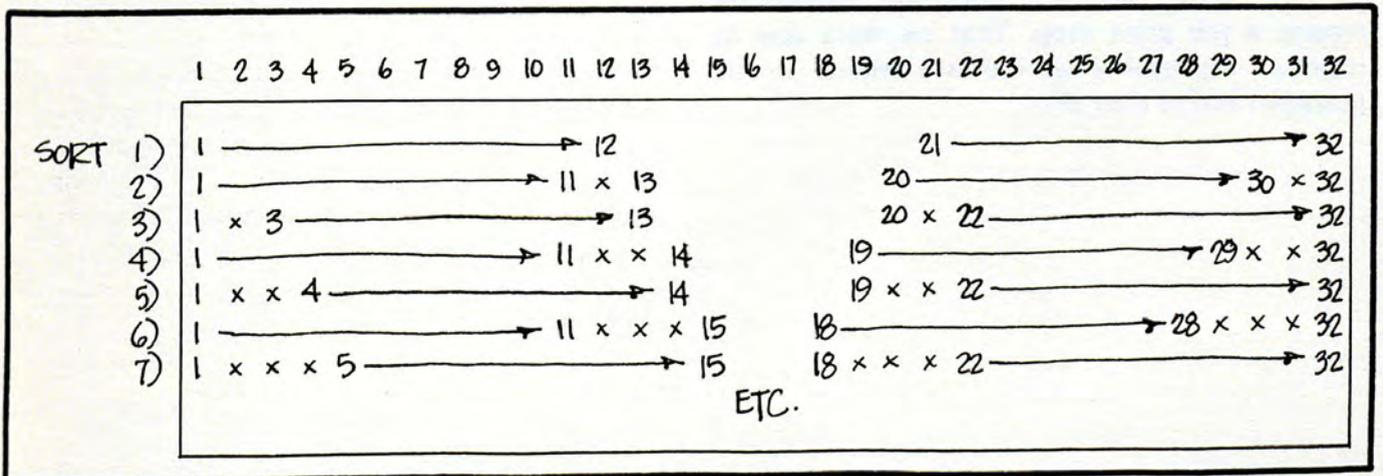
The 72 stacks of 250 prints each were arranged in such a manner as to insure an even distribution of the one-image-at-a-time prints and the two and three-image-at-a-time prints throughout the set. Each stack was then assigned a number from one to 72. The first sort was one through 12, two through 13, and so forth until 61 through 72 was reached. The second sort was one through 11, skip 12, pick up 13, and so forth until 60 through 72, skip 71, pick up 72 was reached. The third sort repeats the second but in reverse order. The final collation required 23 sorts and produced 1271 unique sets.

IMAGE Y B R	TOTAL QUANTITY	GOES TO # AMOUNT
1	3250	F.S. (250) • 1Y4B (750) • 1Y3B (750) • 1Y2B (750) • • 1Y2R (250) • 1Y3R (250) • 1Y4R (250) •
2	3250	F.S. (250) • 2Y4B (750) • 2Y3B (750) • 2Y1B (750) • • 2Y1R (250) • 2Y3R (250) • 2Y4R (250) •
3	3250	F.S. (250) • 3Y4B (750) • 3Y2B (750) • 3Y1B (750) • • 3Y1R (250) • 3Y2R (250) • 3Y4R (250) •
4	3250	F.S. (250) • 4Y3B (750) • 4Y2B (750) • 4Y1B (750) • • 4Y1R (250) • 4Y2R (250) • 4Y3R (250) •
Y B R		
4	1000	F.S. (250) • 4B1R (250) • 4B2R (250) • 4B3R (250) •
1 4	750	F.S. (250) • 1Y4B2R (250) • 1Y4B3R (250) •
2 4	750	F.S. (250) • 2Y4B1R (250) • 2Y4B3R (250) •
3 4	750	F.S. (250) • 3Y4B1R (250) • 3Y4B2R (250) •

CHART A ↑

F.S. = FINISHED STORAGE

CHART B ↓



PRINTING HISTORY. The printing was done at Daniel Industries, Raleigh, North Carolina, on an A.B. Dick Model 360 offset duplicator. The press operators were Harry Daniel and Tommy Brincefield. Collation between press runs was done by Fred Eichenberger and Marian Scott. The inks used were a matched yellow, process blue and fire red, all by Van Son. The paper is an 80 lb. Simpson Lee Coronado cover and was in part donated by the Henly Paper Company of High Point, North Carolina. The original art was by Fred Eichenberger. Final collation of the unique sets was supervised by Fred Eichenberger and Marian Scott.

Each press run processed 13,000 sheets and took about four hours. In all, some 18,000 sheets were processed. The images were deliberately misregistered so as to make recognition somewhat easier. In addition, there was some accidental and inevitable misregistry which shows up in the non-alignment of the numbers. For that, and for the offsetting and the occasional "hickies" that show up, our apologies. We asked a small press and its operators to behave in a manner clearly at variance with standard operating procedures around a job print shop. That we were able to maintain the quality we did is a tribute to the pressmen and to their 360.

Note: We are preparing an exhibition of the entire set of 72 prints plus some explanatory text. It will occupy some 36 square feet of wall space and will be sufficiently flexible to allow for a variety of hangings. The exhibition will be ready for distribution in the Fall of 1970. At this time, we have no idea what the cost will be, certainly no more than is necessary to cover shipping plus insurance.

If you are interested, please contact Fred Eichenberger, School of Design, North Carolina State University, Raleigh, North Carolina, 27607, and we will inform you as soon as it is complete and we have a schedule firmed up.

GENE MESSICK, a former instructor of product design and a graduate of the School of Design, was the founder and director of the experimental intermedia program at Thompson Theatre, NCSU. A graphic designer and versatile technician, he has written, designed, and packaged his contribution to this issue, to be found as an inset in the back of the volume.

INTERMEDIA AS ART AS INTERMEDIA AS ART AS ETC.

(inside back cover)

Gene Messick

The Student Publication of the School of Design, begun in 1950, is maintained as an independent student project. It is nonetheless dependent upon the talents and energies of many persons, students and non-students alike, for its continuation. Volume 19:1 owes a debt of gratitude to:

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DESIGN
AND
COMMUNITY



DESIGN AND COMMUNITY

EDITED BY DAVID ALPAUGH / STUDENT PUBLICATION OF THE SCHOOL OF DESIGN, VOLUME



DESIGN AND COMMUNITY

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Preface

Design and Community is the collective work of the Community Development Group, an organization of some twenty students with various consultants and advisors which grew out of a fifth year design studio in the School of Design. The papers presented here were done in the past year, and many of the same projects and related new ones are being continued this year with financial support from the Urban Affairs and Community Service Center and the Agricultural Extension Service of North Carolina State University.

As the working organization of the CDG is based on a recognition of individual strengths, the conceptual organization or goal structure of the group is dependent upon the nature of each individual project as it is received. The emphasis on housing, child development, and health care did not arise by a capricious selection from a list of stereotyped "issues," but came instead from citizens' groups and local agencies whose real problems could not be solved through other channels, and who turned to the CDG for help in achieving successful, and therefore innovative solutions. This is not to imply, however, that the framework is entirely situation-oriented.

It is important to note that the CDG basically performs the dual functions of production and research, and that of the two, production or service is the most immediately apparent goal. All of the supportive research is undertaken from the standpoint that the findings, and often the processes, will be used as tools toward the implementation of future solutions. However, the research itself is also seen as an important step toward the implicit and more general goal of broadening the information base of man-environment relationships for future research and development.

In this sense, then, the work of the CDG is cyclic: students emerging from a similar background of experience and exposure to information sources identify their areas of interest, then work in specific project areas as they become available; conceptual models are coded through research and analysis to generic models and applied to problem situations; the solutions are evaluated according to the defined criteria from the conceptual framework, and the model is thus expanded or modified according to these results for future application. Also, expanded models are seen in the light of their potential applicability to other problem areas. This explains in part the fact that in the following papers, similar patterns of organizing problems have evolved in projects of apparently different subject matter. For example, the "Observation of Residential Behavior Settings" study will be combined with the theoretical framework of "Residential Behavior Patterns" in two Turnkey III projects this coming year in Asheboro and Raleigh. The concepts of parent-child development from the Winston-Salem project have already been applied to other child development programs in Raleigh (South Park), Zebulon, and Asheboro, and the architectural programming techniques from that study were used to a certain extent in the Craft Center and Soul City.

The development of building programs has become a major area of emphasis because of the pragmatic nature of most of the projects and because all of the problems dealt with thus far have had strong architectural implications. The most complete program study to date by the CDG is the continuing low-income housing demonstration in Murfreesboro and Raeford. It began with the very general problem statement of the need for housing, and branched into studies of user needs and preferences, the economics of ownership, and the economics of construction. Acceptable design alternatives were isolated first by gaming and visual array techniques, then by comparative model and photographic techniques, and finally by evaluation of the built designs. Similar processes can be observed in the design development of the Tuttle Community Center, the Winston-Salem Parent-Child Center, and the Craft Center.

Thus, two of the three major phases of the CDG are production, or development, and ongoing supportive research. The third phase is service, and it is this phase which forms the justification for the first two, for without exposure to the real

problems of real people, a large part of the educational value of the group's activities is lost. A comparison with the community design centers and similar advocacy groups is inevitable, and major differences can be easily discerned. A community design center generally is organized within the community it serves, working directly with the people. The Community Development Group, on the other hand, is organized entirely within a university structure and works primarily with government agencies. This offers two notable advantages; first, it provides the opportunity for much broader service through adequate funding, good political relations with people in power, and the larger scale of problems generally considered by such agencies, and secondly, it allows the group to act as a respected liaison between citizens groups and authorities.

It should be made clear that each paper presented in this volume is a working paper. While each project has intrinsic significance to its authors and their constituents, it also has a more inclusive significance in reference to the broadening of the Community Development Group's existing information base. The papers presented here represent involvement in a broad range of issues by students whose experience in their respective professions is admittedly limited, but whose experience with design education has left them with meaningful insights into problems, processes, and methods of implementation.

Acknowledgements

Obviously, a book of this nature requires long hours of work from many people. I am indebted to Dean Henry L. Kamphoefner for his help in tight spots; to the people of the CDG for ignoring deadlines and coming through with the work in spite of it; to Henry Sanoff, Gary Coates, and Douglas Bennett, for advice, solace, and post-production supervision; to Fred Eichenberger, a prince, for his technical advice; to Helen Johnson, Julie Coates, Pat McLean, and Rick Curtis for typing the final copy; to Winifred Hodge, Anne Craddock, and Brook Gardiner, secretaries in the School of Design; to Susan Simmons for her careful proofreading and corrections; and to Terry Alford, Linda Jewell, Jerry Keith, David and Theresa Raper, Jerry Simmons, and John Valley for production assistance.

David Alpaugh
Editor



Introduction

In the Fall of 1968 the Community Development Group was created as a new entity in the School whose intention was to provide new learning experiences for students of design as well as developing new strategies that may be more effective in having an impact on the quality of the built environment.

Predicated on the notion that learning should be desired for its own sake and bring with it intrinsic rewards, certain aspects are necessary to the cultivation of this intrinsic motivation. Psychologist Jerome Bruner suggests that the students' curiosity must be peaked or tied to his personal concern; the students' competence in many areas must be developed in order to strengthen his confidence; the students should be given opportunities to act as effective components of a working group, not in competition with another, but dependent upon one another.

In order to implement these ideas, the scheduling of instruction should be individualized to the students' personal learning cycle and style. Considering that the learning process generally consists of two stages, search and expand, these stages need to be oriented to the students' needs at that particular time.

The learning options employed by the CDG permitting a more individualized program of learning are as follows:

- A. Lectures
- B. Field Experience
- C. Research Experience
- D. Self-Taught Student Groups
- E. Team Teaching

The initiating project was in Zebulon, North Carolina, where the group was requested to assist the township in formulating a Model Cities Proposal. Together with a 5th

year Landscape Architecture group under Professor Wayne Maynard, CDG placed its emphasis upon planning of resources with special awareness of the sociological implications of design and planning decisions. The apparent dangers of a one crop economy and out-migration were not only peculiar to Zebulon, but most of North Carolina's rural communities. Strategies for overcoming these difficulties resulted in political restructuring of the region as well as in land use planning proposals, with a careful analysis of the key decision makers of the area as indicators of future implementors of programs.

From this work and a rapidly increasing number of requests from local communities as well as local and state government agencies, it was clear that goals and priorities would need to be established for the Group to function most effectively. Thus, the major goals of CDG are:

1. To develop skills and abilities in dealing with new designer-client relationships mutually engaged in pluralistic planning or participatory design processes.
2. To identify new roles and responsibilities for the designer (Architect) in our society and their implications on changing educational programs.
3. To assist in projects that involve community and University groups in the design of their physical environment.
4. To develop a resource base for the University and the community in housing research and development, child development and community health.
5. To provide information, ideas and methods for improving the environment to University and community groups.

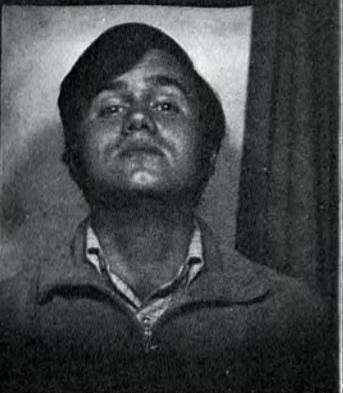
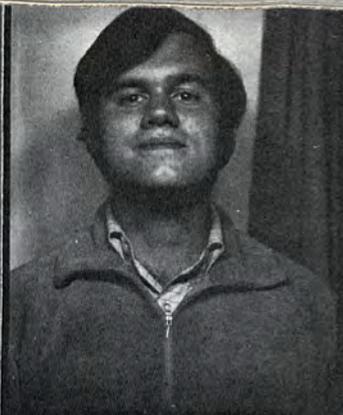
Thus the projects undertaken by CDG are those which will provide the best vehicle for learning the skills, developing the attitudes and confidence as well as serving the community.

To date the CDG has supported different classes of problems:

- A. Research into community social problems through the systematic analysis of changing residential racial patterns; family attitudes and preferences through spatial preference gaming; user perception of selected environments.
- B. Program Development for reinforcing relationships between family members through a Parent-Child Center; health delivery systems from regional to community level.

- C. Participatory Design of child development facilities, playgrounds, and community center facilities, and housing.
- D. Information and services through development of In-Service Training Programs in family housing as well as active participation in advisory groups concerned with planning for the environment.

Henry Sanoff
Director, Community Development Group



A Demonstration of Low-Income Housing

King Burgwyn, Gary Coates, Donald Cohen, George Ellinwood

In the Spring of 1969 two investors residing in Murfreesboro, North Carolina—one a homebuilder, the other a banker—became interested in an experiment in providing improved housing for private ownership for low-income families through the Section 235 Homeownership Program. This program permits private developers to plan housing projects through the local Federal Housing Administration (FHA) insuring office. When the dwellings are completed, they are sold to low-income families who finance their purchases with FHA insured one percent interest mortgages.

Four basic objectives were determined by the coalition group (investors and designers) for this housing project in Murfreesboro: (1) the design should relate to the housing needs of local low-income families, (2) the dwelling should be designed for thermal comfort, (3) the dwelling design should be applicable to factory assembly, and (4) the cost of the factory construction should be comparable to on-site erection.

To realize these objectives, two exploratory research studies were conducted. The primary aim of the studies was to gain an awareness of the "housing" needs of low-income families through survey research instruments which sought factual information about the family, and attitudes towards family solidarity. A game that solicited the preferred spatial arrangement of areas within the home and the visual preference of various housing types was also included in the survey instrument.

Another aspect of the research was concerned with the economics of providing housing financed under the FHA 235 program. This study describes the various costs: mortgage, insurance, tax, maintenance, and utility, which comprise the

monthly housing expenses. The segment of the mortgage allocated towards the construction cost was subdivided into three elements: horizontal membranes (floor and roof), vertical membranes (walls), and utility systems. Each of these elements was examined in the context of both on-site erection and factory assembly.

The results of these two studies culminated in a set of recommendations to build two demonstration houses designed to realize the stated objectives.

In response to the floor area and construction cost constraints imposed by the FHA, a geometric cube was proposed as the most efficient form, both thermally and economically. The two-story dwelling configurations arising from the 24'x24'x24' cube generated volumes that resulted in more usable floor space than other geometries as well as the necessary cross-ventilation for all living areas.

White low-income families moving from crowded, substandard housing are not as concerned with spatial arrangements or visual subtleties of new housing as essential criteria for home selection. When their basic needs, such as floor area, are satisfied, planning and design implications become more relevant. An attempt was made to have the low-income families visually discriminate between non-designed (tract subdivisions) and designed building form silhouettes.

A significant number of the respondents preferred the designed alternatives to the more conventional house forms. This preference can be explained by the fact that many low-income women are employed in upper income homes as domestic workers. Their favorable response to the designed dwellings may be related to the visual cues which are associated with upper-income housing—two stories, ascending stairs in entrance area, spacious rooms. Consequently, by employing such visual cues the desire for a non-designed or tract house may be bypassed for more innovative dwelling types.

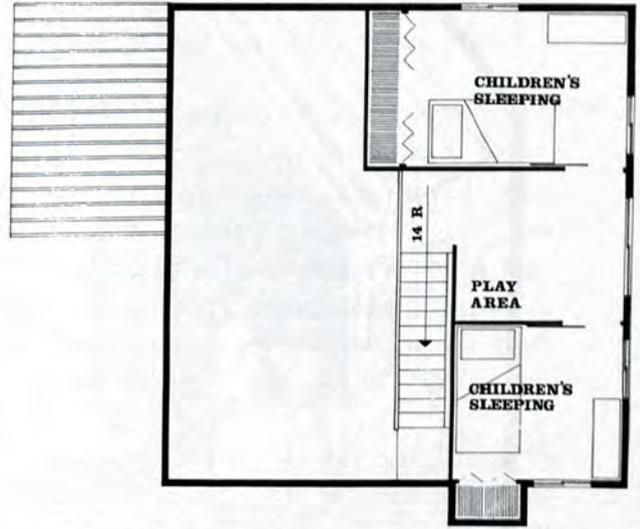
The two-story concept also accommodated the need for privacy among family members. The location of a second floor space for children's sleeping and play areas permits the living-dining area to be utilized for household leisure activities. From her kitchen domain, the mother can monitor activities in the children's area and participate in family activities in the living-dining area.

The clerestory windows located at the peak of the two-story living-dining area suggests a more apparent spaciousness as well as a major cross-ventilation source permitting "stack action" to occur.

To implement factory assembly, the dwelling was classified into a set of components—floor panels, exterior wall panels, partitions, and a mechanical core. These components are assembled to produce two transportable sections 12' wide and 24' long. These sections are pneumatically lowered onto a pre-installed foundation and the hinged components comprising the second floor erected. The application of roof fittings and storage components, which comprise the field installation package, complete the erection process.

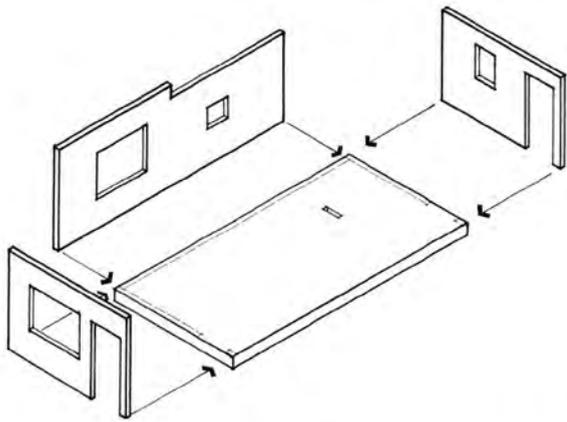


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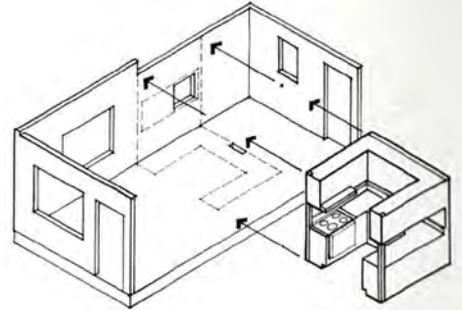


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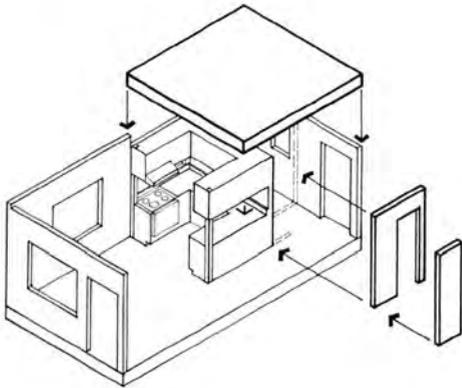
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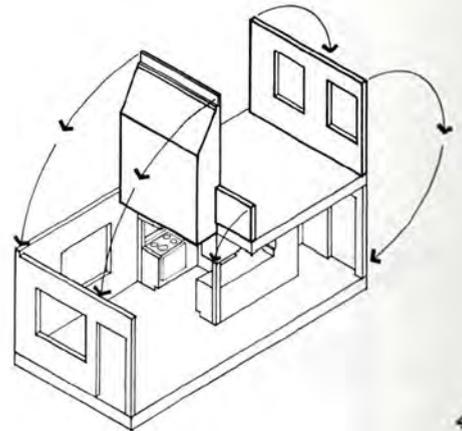
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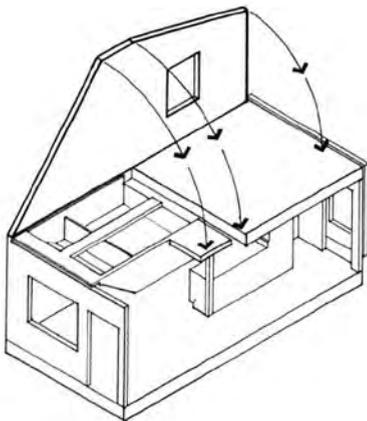
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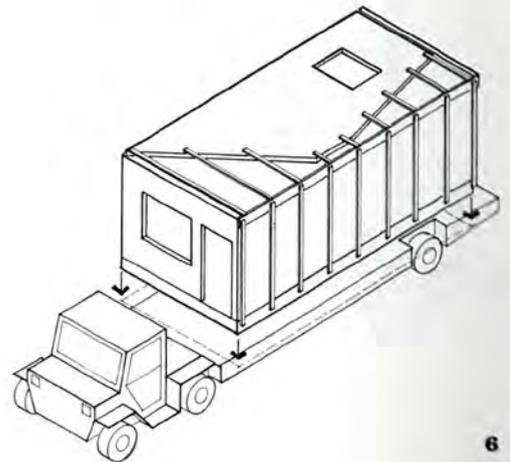
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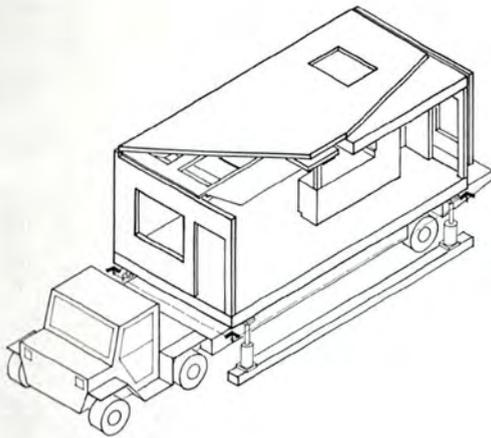
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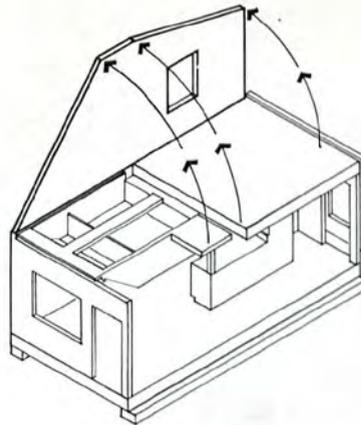
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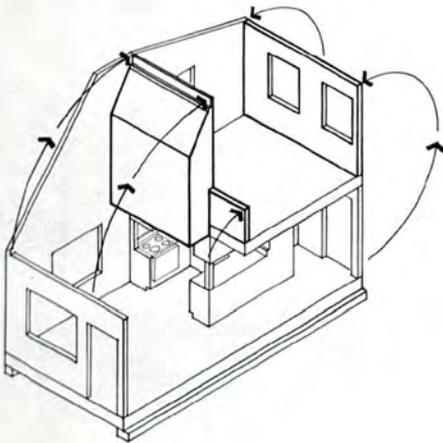
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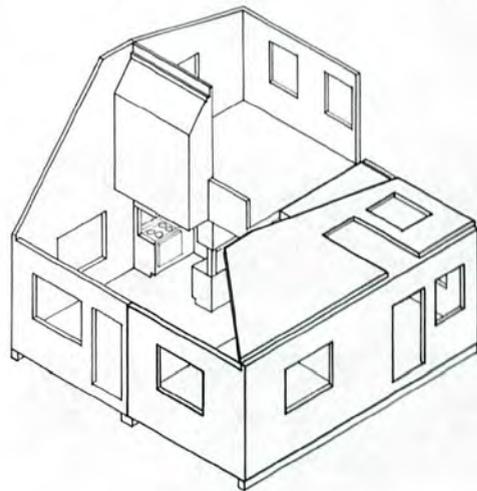
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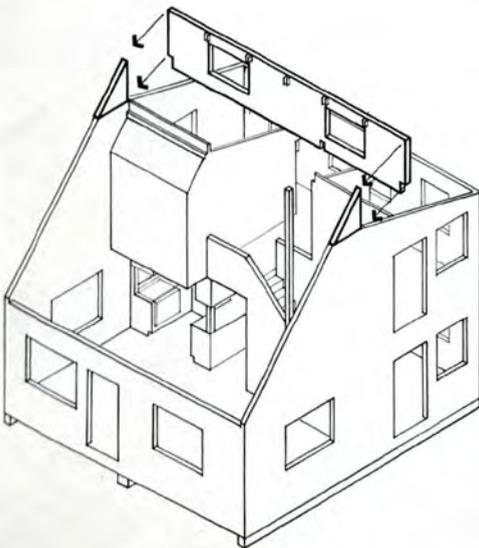
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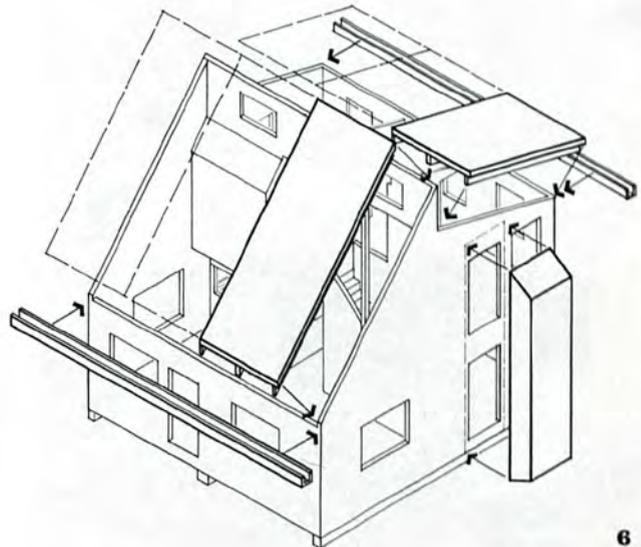
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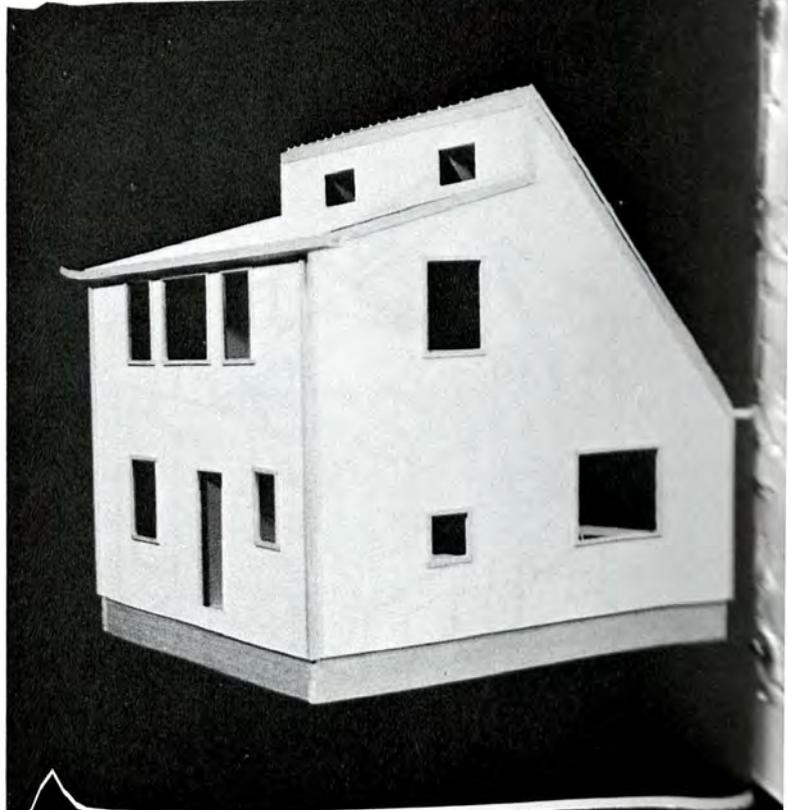
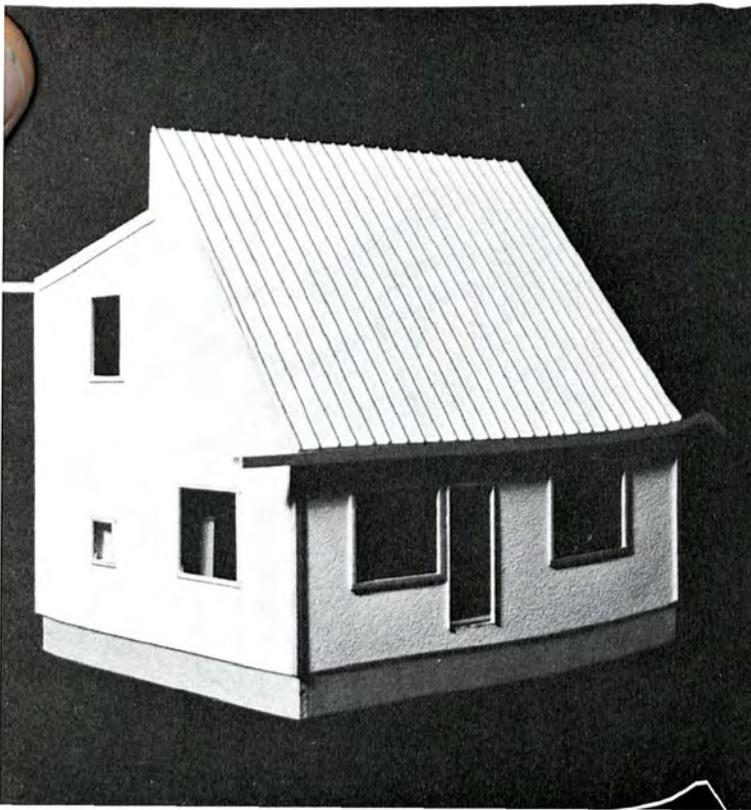
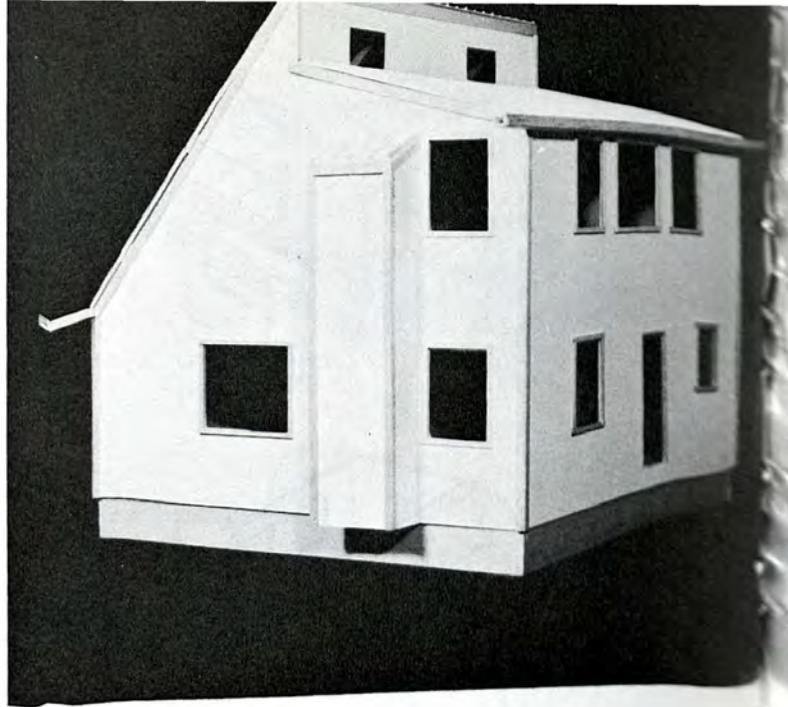
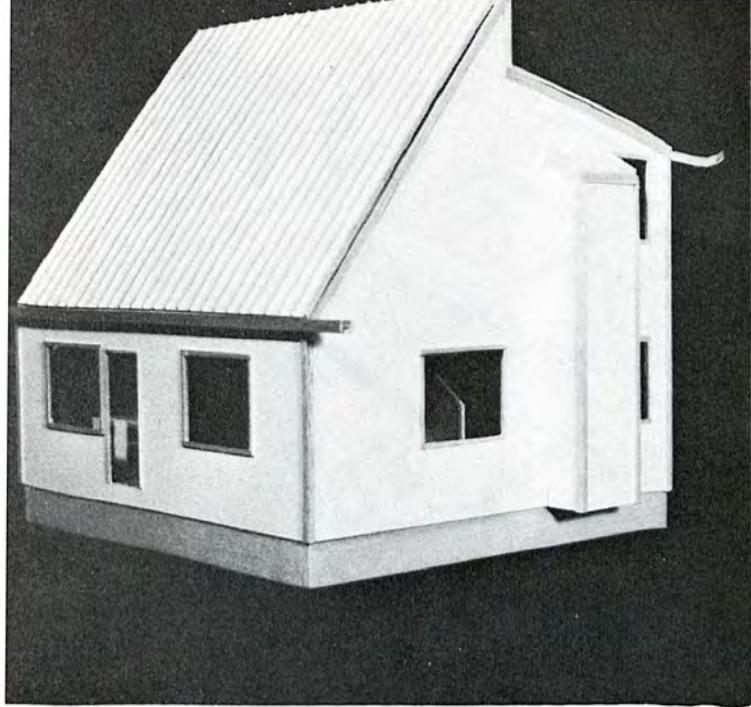
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Family Attitudes and Housing Preferences

Henry Sanoff

In the next ten years, the President's Committee on Urban Housing¹ has recommended that 26 million more new and rehabilitated housing units be built, including at least six million for lower income families. It is also clear that new and foreseeable technological breakthroughs in housing production will not themselves bring adequate shelter within economic reach of the millions of house poor families in the predictable future. In order to bridge the gap between the market place costs for housing and the price lower income families can afford to pay, appropriations of federal subsidies are essential and will need to be increased.

For effective solutions for housing people, especially the poor, it is essential that the type of housing and tenure reflect their needs and values. There is the realization of the user as a vital ingredient in guiding change towards a more meaningful environment and the need for research to preempt hunches and intuitive speculations of personal values, previously the basis for design decisions.

In varying degrees research in housing is being advanced on the problems of types of housing demand;² the ecology of the dwelling; that is, the internal spatial design of dwellings as self-contained shelter for social relations and personality development;³ residential livability and satisfaction;⁴ the social relations between residents in housing projects and environing community;⁵ factors involved in privacy;⁶ and emerging social organization of residents.⁷ In several of these spheres there are continuing advances in research methods and procedures.⁸ It is a commonplace to say that social surveys are an important source of evidence bearing on architectural decisions. Yet the volume of survey work in this field is quite small and published results are not at all accessible to architects.

Previous empirical studies, however, have made an important case for the argument that physical planning is an important influence on individual behavior. The issue is

no longer the relative importance of the physical environment to other factors, but rather whether spatial differences in the environment are related to corresponding differences in attitude and behavior. The manipulation of physical space does have effects on social behavior, but the effects will vary according to the presence of non-physical variables.

The non-physical dimension may be described as follows:

- personal and family relations
- relations with neighbors
- attitudes toward community
- social self-concept
- psychological state (optimism and pessimism)
- reactions to neighborhood environment

Intra-housing use patterns may be representative of family relationships where the salient values of family members in assessing their dwelling may be described as the degree of efficiency in performing household tasks, the appearance of their dwelling to others, the ability of the dwelling to accommodate societal norms about family living and the ability of the dwelling to facilitate spontaneity.

Dean⁹ hypothesizes that when conflict becomes intense, the use patterns modify as follows:

1. Defining territories
2. Time rescheduling for competitive uses
3. Functional differentiation between activities
4. Exercise of controls.

From these dimensions it is possible to extrapolate a number of variables for testing hypothesis. This investigation attempted to link certain attitudes with environmental preferences. The assumption is that housing preferences cannot be explained out of context of the respondent's more pervasive life situations. Housing preferences may be better explained in terms of an individual's attitude toward other aspects of family life. Clearly, a study of family value orientations is generally more desirable, since values tend to endure,¹⁰ while attitudes may change more frequently. Attitudinal scales, however, were selected because of the continuum on which families could be easily located and described as well as their availability. A search of the

environmental related attitudes, particularly intra-dwelling oriented, revealed that leisure and family solidarity may influence individual preferences for various spatial arrangements. It is recognized that the existence of these and other attitudes varies with the individual, however, it is felt that the dominant attitudes may be translated into housing preferences.

Family Solidarity

It has been frequently noted that members of some families are more closely bound together as a group of interacting persons than is in the case of other families. This variable of family interaction has been referred to as unity, coherence and solidarity.¹¹ Strong family solidarity suggests use patterns of intra-dwelling unit interaction, many group activities, as well as the performance of major household tasks. Integrated individualized families, where the concern is towards the member's self-realization of his potentialities and objectives may require use patterns that indicate segregated leisure activities, frequent interaction of family members with other institutions, simultaneous individual pursuits with appropriate privacy and space.

Leisure

Leisure is defined as the time we are free from the more obvious and formal duties which a paid job or other obligatory occupation imposes upon us.

Life styles of different families greatly influence their leisure pattern.¹² Since families with different life styles have different preferences in terms of their residential space requirements, it was hypothesized that the type and intensity of leisure activities of different families may provide some clue to their spatial preferences.

In response to the problem of finding the necessary information about aspects of housing which could best serve the needs of the residents we attempted to discover differences in the values and preferences of low income families that would be accountable for differences in their housing requirements.

The question fundamentally was, what activities of the household are of primary

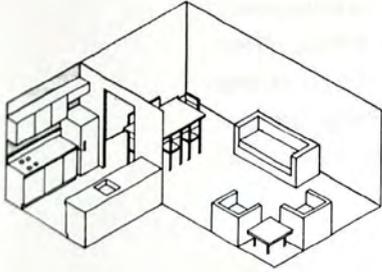
importance to the occupants and how do these preferences relate to family attitudes. To answer this question, it was necessary to study families who were of similar socio-economic status. The stratified sample was randomly selected and requested to respond to a questionnaire which consisted of several parts;

1. Factual information about the family
2. Leisure activity patterns
3. Attitudes towards family solidarity
4. Preferred spatial arrangements
5. Visual preference of housing types.

Methodology

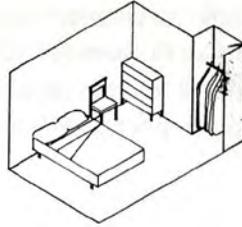
An index was developed for the responses to leisure activities as well as for family solidarity. Each of the indices classifies respondents into low, medium and high categories for the purpose of analysis.

Information about preferred spatial arrangements was based on a set of visual displays with an associated value similar to a "parlor game". (*Figure 1.*) The media of presentation was selected because of its high level of abstraction and presence of a limited number of inferential cues. It was important that any cues related to texture, material or color be omitted at this initial stage of assessment in order that the respondents were making choices solely on physical form characteristics. This housing game is based on trade-offs between discrete classes of activities. The activity areas of the household were bifurcated for gaming purposes between decisions about sleeping areas for children and adults and food preparation, dining and living areas. An allocation of 64 points was given to the player(s) with two trials to attain this allocation. The points were based on a cost per area ratio with a 2:1 ratio for utility and non-utility areas. (*Appendix Table 3.*) The decisions were then based on which of the two classes of activities were perceived as most important by the respondent. The critical decision point is between the need for privacy between food preparation, eating and living and children's sleeping spaces with an adjacent play space.



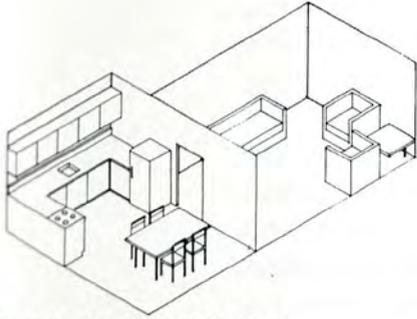
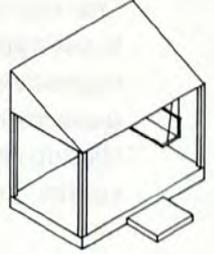
living - dining & kitchen

31



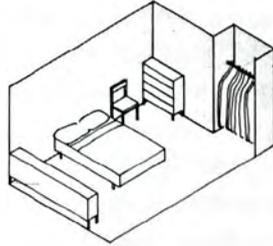
parents bedroom

11 porch



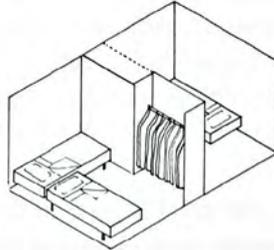
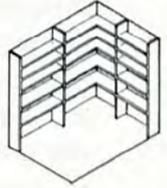
living & dining - kitchen

34



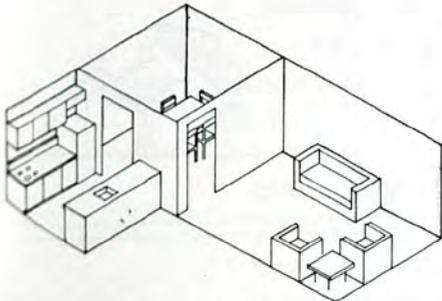
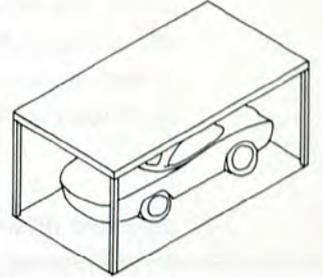
large parents bedroom

14 storage room



childrens bedrooms

14 carport



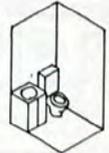
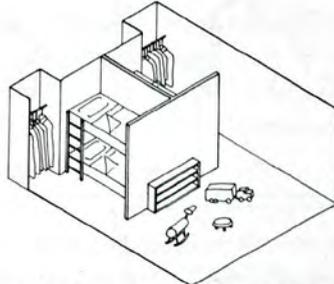
living & dining & kitchen

36

childrens bedrooms & playroom

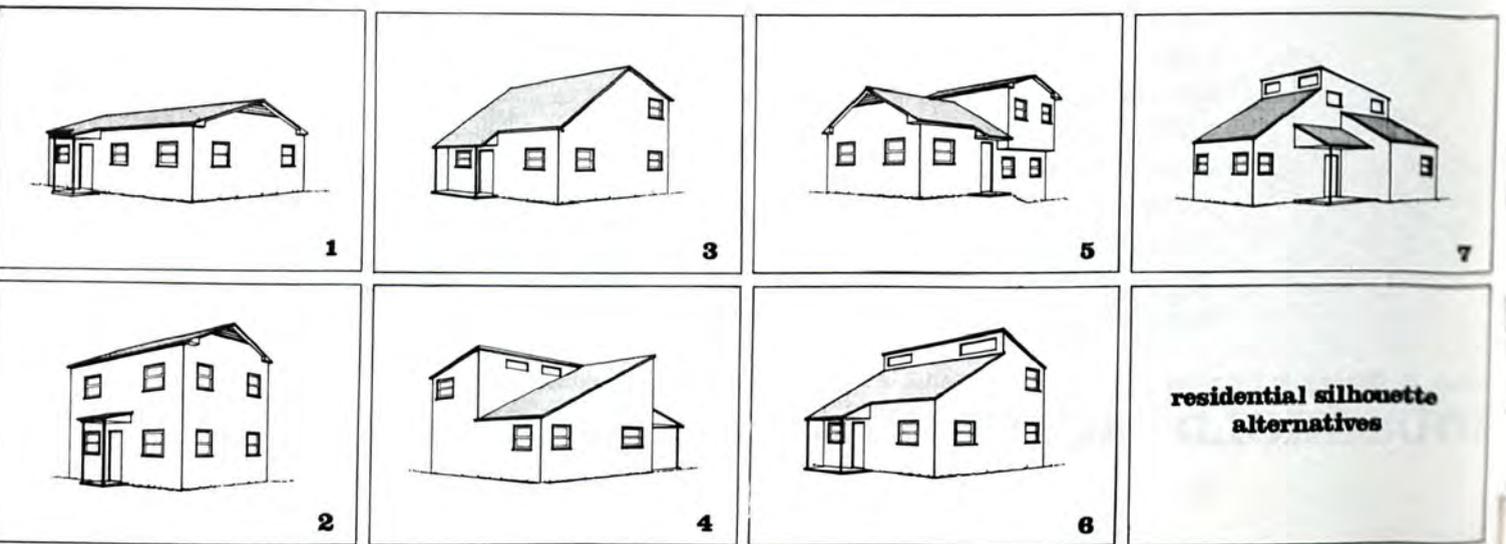
22

half bath



HOUSEHOLD ACTIVITIES GAMEBOARD

The last part of the interview consisted of a set of visual displays representing house types which included standard "developer" types to "designed" types. The respondent was required to rank order in terms of his visual preference each of the seven visual displays. (Figure 2.) This technique was selected as the procedure for eliciting responses to the visual displays primarily because of the relative ease of recording judgments.



The sample size which was limited by manpower and time, consisted of 27 households. The study was carried out as a small group exercise in survey research methods at the Department of Architecture, North Carolina State University. Consequently, the results possess the shortcomings to be expected in an exercise where the primary purpose was not collecting reliable data.

Demographic Description of Population

The study was conducted in the town of Murfreesboro in Eastern North Carolina and in a residential area with a high concentration of low income families where twenty-seven households were randomly selected for interviewing. The population was dominated by home renters (81.5%) with 18.5% owning their present homes; all were Negro. Many of the residents (37%) have lived in the same house over ten years, while 7.4% have lived there less than one year and 55.6% have lived there from two to ten years. The house types were mixed but predominantly duplex with an entry porch leading to two attached dwelling units. Excluding the bathroom 70.4% of the sample lived in three rooms. 14.8% in four room and 14.8% lived in accommodations larger than four rooms and less than eight rooms. The median size of dwelling units in this sample group was 3.9 with an occupancy rate of 1.3 persons per room. While a majority (63%) of the families have an indoor flush toilet, 37% do not.

The average number of children was 3.1 for the 81.4% of families with children. Children in the first through sixth grades constituted 61.1% of the total number of children in the sample group with 35.1% in the seventh through 12th grade. Almost one half of the sample group (48.2%) were between the ages of 30-50 years with 29.6% over 50 and 22.2% below thirty years.

DISCUSSION OF THE DATA

When the respondents were provided with a choice most preferred (*Table 1*) the living and dining, kitchen combination(L-DK) (59.3%) while 25.9% preferred the living, dining and kitchen arrangement (LD-K) and 14.8% the living and dining and

kitchen (L-D-K). Families with a preference for a separate living, dining and kitchen (L-DK) preferred a large parents' bedroom (75%) as well as families with a preference for a living room and dining-kitchen (56%). The families with a preference for a small parents' bedroom (57.2%) also favored a living-dining room and a separate kitchen (LD-K).

TABLE 1

Percent Distribution of Household by Children's Sleeping Arrangement and Living Preference

Parents' Sleeping	LIVING ARRANGEMENT					
	LD-K (31)		L-DK (34)		L-D-K (36)	
	No	%	No	%	No	%
Small Bed	4	57.2	7	43.8	1	25
Large Bed	3	42.8	9	56.2	3	75
TOTAL	7	100.0	16	100.0	4	100

Compared to Table 1, the families selecting LD-K (57.2%) preferred the additional play space with the children's bedrooms (*Table 2*) and the small parents' bedroom. The families preferring L-DK and L-D-K preferred the two bedroom alternative for the children by 87.5% and 100% respectively and the large parents' bedroom (*Table 1*).

TABLE 2

Percent Distribution of Household by Children's Sleeping Arrangement and Living Preference

Children's Sleeping	LIVING ARRANGEMENT					
	LD-K (31)		L-DK (34)		L-D-K (36)	
	No	%	No	%	No	%
2 Bedrooms	3	42.8	14	87.5	4	100
2 Bedrooms & Play	4	57.2	2	12.5	0	0
TOTAL	7	100.0	16	100.0	4	100

When asked for the most important extra space (*Table 3*) of the four available choices, families with a LD-K preference selected a half-bath (42.8) while those with a L-DK preference selected equally between a storage room and half-bath (31.2). Families with a L-D-K preference also preferred the porch (50%).

TABLE 3*Percent Distribution of Households by Extra Space and Living Preference*

Extra Space	LIVING ARRANGEMENT					
	LD-K (31)		L-DK (34)		L-D-K (36)	
	No	%	No	%	No	%
Porch			3	18.8	2	50.0
Storage	2	28.6	5	31.2	1	25.0
Half-bath	3	42.8	5	31.2	1	25.0
Carport	2	28.6	3	18.8		
TOTAL	7	100.0	16	100.0	4	100.0

Families that presently occupy dwellings with three rooms or less, increasingly prefer living arrangements offering more space. The alternative with the largest area was L-D-K (36) which had been selected by 100% of those residing in three rooms. Alternative L-DK (34) was selected by 81.5% of those in the same dwelling class. While most of the families (71.5%) living in 4 or more rooms preferred LD-K (31). (Table 4.)

TABLE 4*Percentage Distribution of Households by Size of Present Dwelling and Preferred Living Arrangement*

Number of Rooms	LIVING ARRANGEMENT					
	LD-K (31)		L-DK (34)		L-D-K (36)	
	No	%	No	%	No	%
3 or less	2	28.5	13	81.2	4	100.0
4 or more	5	71.5	3	18.8	0	0.0
TOTAL	7	100.0	16	100.0	4	100.0

Families with a high solidarity index preferred L-D-K (75.0%) whereas those selecting LD-K or L-DK scored medium on the family solidarity index with 71.4% and 68.8% respectively. Strong solidarity is associated with a preference for larger family oriented spaces rather than space for family subgroups (i.e. children).

TABLE 5*Percent Distribution of Households by Family Solidarity Index and Living Preference* ¹³

Family Solidarity	LIVING ARRANGEMENT					
	LD-K (31)		L-DK (34)		L-D-K (36)	
	No	%	No	%	No	%
Low	1	14.3				
Medium	5	71.4	11	68.8	1	25.0
High	1	14.3	5	31.2	3	75.0
TOTAL	7	100.0	16	100.0	4	100.0

From the distribution in Table 6, it can be seen that with increasing family solidarity there is a stronger emphasis for two bedrooms than two bedrooms and play space. The preference appears to be in the areas that are strongly family oriented than particularly children oriented.

TABLE 6*Percent Distribution of Households by Children's Sleeping Preference and Family Solidarity Index*

Children's Sleeping Preference	Family Solidarity					
	Low		Medium		High	
	No	%	No	%	No	%
2 Bedrooms			13	76.5	8	88.9
2 Bedrooms and Play	1	100.0	4	23.5	1	11.1
TOTAL	1	100.0	17	100.0	9	100.0

There is substantial evidence that the choices people make are influenced by their experience and the degree to which their present needs are satisfied. This was verified by the data in Table 7, which suggests that families without an indoor flush toilet least preferred an extra half-bath (10%) compared to those who presently have an indoor toilet (47%). The major extra space desired by families with no indoor toilet was storage (40.0%).

TABLE 7*Percent Distribution of Households by Extra Space and Availability of Indoor Toilet*

Extra Space	INDOOR TOILET			
	Yes		No	
	No	%	No	%
Porch	3	17.6	2	20.0
Storage	4	23.6	4	40.0
Half-Bath	8	47.0	1	10.0
Carport	2	11.8	3	30.0
TOTAL	17	100.0	10	100.0

Leisure

It was expected that whether a family owned or rented a home would influence their pattern of leisure or their index of leisure. The data suggest that families that own their homes scored 20.0% in the high index compared to renters who scored 4.6% in the same index.

TABLE 8*Percent Distribution by Household of Their Leisure Index and the Type of Occupancy*

Leisure Index	TYPES OF OCCUPANCY			
	Rent		Own	
	No	%	No	%
Low	5	22.7	2	40.0
Medium	16	72.7	2	40.0
High	1	4.6	1	20.0
TOTAL	22	100.0	5	100.0

When comparing the families leisure index with their family solidarity index, it is evident that the nature of the leisure activities that the respondents scored highest are familial oriented. (Table 9) For example, 77.8% often converse with the family, 77.8% often attend church, 88.9% often watch TV and 51.9% often play with children. (Table 10) It is, therefore, evident by the data that the respondents' household leisure activities and their attitudes towards family solidarity are mutually supporting as described on Table 9.

TABLE 9

Percent Distribution by Household of Their Family Solidarity Index and Their Leisure Index

Family Solidarity Index	LEISURE INDEX					
	Low		Medium		High	
	No	%	No	%	No	%
Low			1	5.6		
Medium	4	57.1	12	66.7	1	50.0
High	3	42.9	5	27.7	1	50.0
TOTAL	7	100.0	18	100.0	2	100.0

Since the Leisure Index scores reflect the Family Solidarity scores, it was expected that families with a high leisure index would prefer not to have the additional children's play space. In fact, the comparative responses suggest that families with a medium and high Leisure Index prefer the two children's bedrooms by 71.5% and 9.5% respectively than those of the same index preferring the added play space by 50.0% and 0.0% respectively. (Table 10)

TABLE 10

Percent Distribution of Households by Their Leisure Index and Their Preferences for Children's Sleeping Areas

Leisure Index	CHILDREN'S SLEEPING AREAS			
	2 Sleeping Spaces		2 Sleeping Spaces & Play Space	
	No	%	No	%
Low	4	19.0	3	50.0
Medium	15	71.5	3	50.0
High	2	9.5		
TOTAL	21	100.0	6	100.0

When comparing the families scores within each index, it was found that in the Family Solidarity Index the average score was 16 out of a possible 20, while in the Leisure Index the average score was 73.7 out of a possible 108. The sample population can be described as higher in family solidarity (80%) than in their leisure activities (68.2%). An explanation for the relatively low average on the leisure can best be explained by certain activities which the population group never engages in. For example, 88.9% of the respondents never go on picnics, 77.8% never attend motion pictures, 88.9% never engage in community service work, 74.1% never wash or repair car, 63.0% never play card games, and 48.2% never cook outdoors.

TABLE 11

Percent Distribution by Household of Their Leisure Activities and Level Participating Most Often

Activity	PARTICIPATING MOST OFTEN	
	Level Of Significance	Percentage
Working around the house	.01	96.3
Watching TV	.01	88.9
Listening to radio	.01	77.8
Conservation with family	.01	77.8
Sitting outdoors	.01	77.8
Attending church	.01	77.8
Sitting and relaxing	.01	55.6
Playing with children	.01	51.9

Visual Preference

The respondents were asked to rank order in terms of their visual preference seven alternative exterior designs all of comparable costs.¹⁴ Four of the residential types of visual displays are commonly found in Eastern North Carolina while three were specifically designed for this test, however, based on the social as well as the physical needs of the potential users. (Figure 2)

TABLE 12

Household Responses by Rank Order Preferences and Array of Visual Displays (Figure 2)

Rank Order	VISUAL DISPLAY						
	1	2	3	4	5	6	7
1	16	0	1	1	3	2	3
2	5	5	0	0	5	7	4
3	1	6	8	0	0	4	6
4	2	3	8	3	2	4	3
5	1	3	2	2	10	5	2
6	1	3	1	8	4	3	5
7	0	5	5	11	1	0	3
TOTAL	48	108	108	148	102 ¹⁵	87	102 ¹⁵
Rank Order	1	5	5	6	4	2	3

In order to obtain the best estimate of a "true" ranking, the individual rankings were summed where the most important or preferred factor has the smallest sum. Visual Display Number 1 had the lowest score and was most preferred. This residential type is most commonly found in the area and represents the visual description of new housing for low and moderate income families. The second most preferred display was Number 6 which represents a more visually innovative house type suggested by the design team. Many of the visual characteristics of the non-conventional design types are, however, reflective of the local vernacular. Visual Display Number 4 was selected as the least preferred of the set. It was described as "too different" from what most respondents perceive as a house or beyond their perceptual reality.

CONCLUSION

The small stratified sample that had been available was not sufficient to demonstrate statistical reliability, but they do suggest the kinds of results that could be indicated by data based on samples of adequate size and representativeness.

There appeared to be an inverse relationship between the respondents concern for more personal area (large parents' sleeping, separate dining, living, kitchen) and children's area (children's sleeping and play space) and their family solidarity. The emphasis appears to be in areas devoted to family oriented activities which includes the participation of all members. The preference for a large parents' sleeping area may be linked to the present use of parent bedrooms as socializing areas. In low income communities where residents occupy three and four room dwelling units for a family size of five or more, it is usual for the living and bedroom to serve as family spaces, as well as eating to be visually separated from socializing and living areas. Furthermore, the choices people make are generally within the context of their own experiences. Decisions are made that are based on the residents' "felt" needs resulting from dissatisfaction with his present environment and may be invariant with any commonly accepted standards.

The concept of flexibility has become increasingly popular in the last few years. The reason for this interest is that housing needs change over the family's life cycle and that different families do different things with their homes. Infinite flexibility, however, is not predictable. As a result, it is important to discover which variations in need should be met by basically different designs and which should be met by

design flexibility. Thus it is important to understand the differences in the ways in which people use their homes, difference in the ways in which people want to live and the main sources of complaint about existing dwellings.

Studying housing needs by obtaining a better understanding of people should ultimately permit more satisfactory planning and house design than studying families preferences, *per se*, than buying habits or even time and motion studies.¹⁶

A better understanding of people's attitudes and values may influence the more appropriate design of housing for different groups which could add to better livability and satisfaction with life in general. If attitudinal patterns could be adequately identified in individual families and their consequential housing characteristics known, it is clear that more satisfactory housing could be provided in the future.

The Questionnaire

The instrument was pretested in the survey area, Murfreesboro, N. C., and varied considerably in its final form based on the comments of the interviewers.

Demographic items on the questionnaire referred to household composition, occupation of head of household, age of family members, length of time in house, type of occupancy and size of dwelling.

The sample group was asked five questions about their attitude towards family members and their relations with each other. They included the importance of family decision-making, self-sacrifice for the good of the family, family cohesiveness in time of stress and the generation gap between children and parents. From the responses to this set of questions an index of Family Solidarity was established.

Another section of the questionnaire focused on the respondent's leisure activities. The respondents were requested to indicate the frequency with which they engaged in a listing of 27 leisure activities and their scores were tabulated in a Leisure Index.

Interview Procedure

Notices were sent to the local school alerting the residents of the survey areas that a series of questions may be asked of them pertaining to their housing needs. The interviewers were instructed to exercise judgment and to withdraw from any situation if they felt the respondents were apprehensive or antagonistic to any of the questions. To the contrary, the interviewers were well received and the interest and participation level of the respondents was extremely high especially in the visual gaming techniques.

APPENDIX

TABLE 1

Respondents Classified by Their Rank Order Preference and Visual Displays – Leisure Index

Rank Order	VISUAL DISPLAY																				
	1			2			3			4			5			6			7		
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
1	3	13	–	–	–	–	–	1	–	–	1	–	1	1	1	1	–	1	2	1	–
2	3	2	–	–	4	1	–	–	–	–	–	–	2	3	–	1	6	–	1	2	1
3	–	1	–	2	4	–	2	5	1	–	–	–	–	–	–	1	2	1	1	5	1
4	–	1	1	–	3	–	2	6	–	2	–	1	–	2	–	1	3	–	1	2	–
5	1	–	–	1	2	–	–	1	1	2	–	–	1	8	1	1	4	–	–	2	–
6	–	–	1	1	2	–	–	1	–	–	8	–	2	2	–	1	2	–	2	2	1
7	–	–	–	2	2	1	2	3	–	2	8	1	–	1	–	–	–	–	–	3	–

TABLE 2

Respondents Classified by Their Rank Order Preference and Visual Displays – Family Solidarity Index

Rank Order	VISUAL DISPLAY																				
	1			2			3			4			5			6			7		
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
1	1	11	4	–	–	–	–	1	–	–	–	1	–	3	–	–	1	1	–	1	2
2	–	4	1	–	4	1	–	–	–	–	–	–	–	4	1	–	3	4	1	2	1
3	–	–	1	–	5	1	1	4	3	–	–	–	–	–	–	–	3	1	–	4	2
4	–	1	1	–	1	2	–	6	2	–	1	2	–	2	–	1	3	–	–	2	1
5	–	–	1	1	1	1	–	1	1	–	1	1	–	6	4	–	5	–	–	2	–
6	–	1	–	–	2	1	–	1	–	–	6	2	1	1	2	–	1	2	–	4	1
7	–	–	–	–	3	2	–	3	2	1	8	2	–	–	1	–	–	–	–	2	1

TABLE 3*Room Sizes for Combined Spaces Based on FHA Minimum Property Standards*

COMBINED SPACE	Living Unit with 3 Bedrooms (sq. feet)
Living-Dining Area (LD)	220
Living Room (separate dining room) (L-D)	150
Kitchen-Dining Area (DK)	140
Kitchen (separate dining room) (K)	60
Dining Room (separate) (D)	90

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Costs of Homeownership for Low-Income Families

King Burgwyn

As early as the 1930's, surveys showed that 70 per cent of the country's population desired home ownership. Numerous studies have described the economic advantages of tax exemptions and forced savings that result from ownership.¹ The social need for family security and self-expression have also been related to ownership and often outweigh a family's economic considerations.² The importance of housing in relation to the scale of family preferences of basic necessities is manifest in the monthly budget. Glenn Beyer notes that one week's pay should equal one per cent of the price of the house and housing expenses should not exceed 20 to 25 per cent of the monthly payments.³ However, for families earning less than \$7000 a larger portion of the budget is required to purchase new housing available on the private market. Only about 1 per cent of new homes sell for prices (less than \$12,000) that low and moderate income families can afford without government assistance. Essentially, it is the 35 per cent of the population with incomes below \$7500 that critically needs the "decent home and suitable living environment" that Congress guarantees every American family.⁴

Since the national housing legislation was established by Congress during the Depression, 10 million middle-income families have realized home ownership through the Federal Housing Administration (FHA) programs. Consequently, home ownership increased from 43 per cent in the 1940's to 63 per cent by the end of the 1960's.⁵ However, it has only been in the last three years that government-assisted home ownership has been available to low and moderate income families. The programs that provide ownership utilize private enterprise extensively and can potentially house families earning as low as \$3300.

Schedule of Monthly Ownership Costs

Home ownership is supplied to families by means of a financial credit system which is based on a schedule of monthly payments. Essentially, the monthly cost of ownership may be defined as the price for which various institutions will supply families with the necessities required to own and operate a house. This total price may be divided into five components: (1) the cost of a mortgage, (2) the insurance cost, (3) tax cost, (4) maintenance expenses and (5) the cost of service utilities. (See Table 1 and Figure 1).

TABLE 1

Distribution of Monthly Costs for Average FHA Single Family Home Sold in North Carolina in 1969¹

COST ITEM	AMOUNT	PERCENTAGE
Mortgage ²		
Principal (house, land, closing cost)	\$ 57	25 %
Interest	105	46
Insurance ³	5	2
Taxes ⁴	24	11
Maintenance ⁵	14	7
Utilities ⁶	20	9
TOTAL	\$ 225	100 %
Family Income Required to Pay 25% for Housing Expenses	\$ 10,800	

1 Average price was \$ 20,468 in 1969.

2 30-year mortgage at 8½ per cent interest plus ½ per cent mortgage insurance premium and 5 per cent down payment.

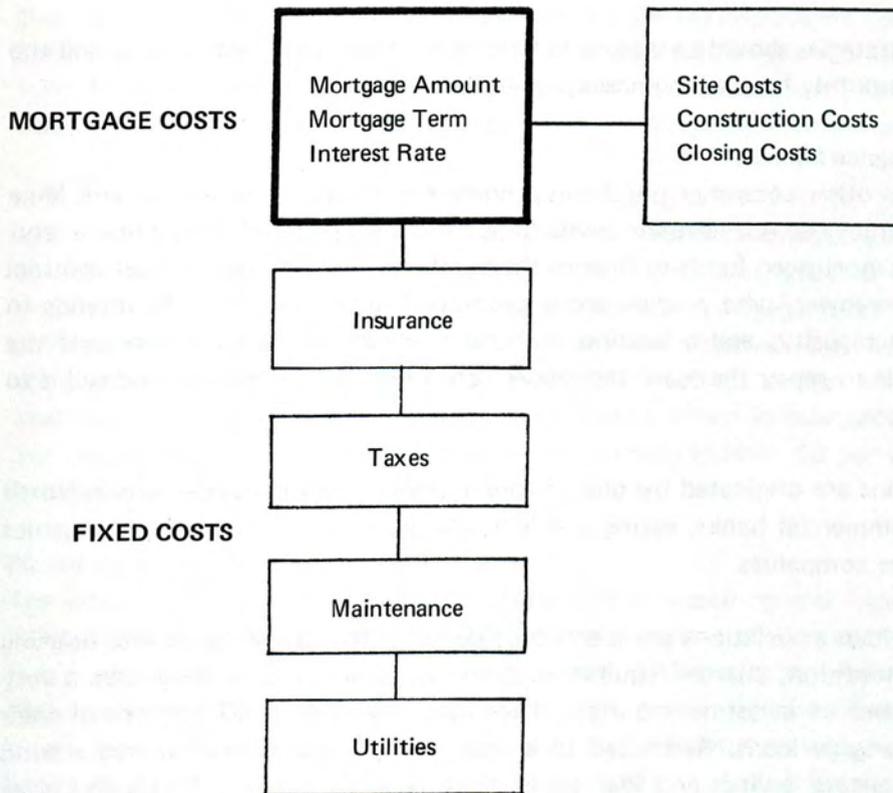
3 Based on \$ 3 per thousand of purchase price annually.

4 Based on \$ 25 per thousand of purchase price annually.

5 Average expenditure for families earning between \$ 5-10,000 in the South.

6 Estimated for North Carolina (U. S. average is \$ 25).

FIGURE 1 *Components of the Monthly Costs of Homeownership*



Of these components, insurance, tax, maintenance, and utilities are virtually fixed. That is, regardless of government policy or selling price reductions, these costs will not decrease. While attention has been given to minimizing their impact, the main thrust of government programs has been to reduce the large portion of the monthly payment attributable to interest costs. Recently, a second cost reduction strategy has been to decrease the construction cost of the dwelling by utilizing industrialization.

Both these strategies should be viewed in light of the housing finance system and the schedule of monthly housing expenses paid by low income families.

Mortgage Finance System

In relation to other consumer purchases a home represents a large investment. Nine out of ten families do not have the assets to pay the costs of purchasing a home and must borrow mortgaged funds to finance the purchase. A mortgage is a legal contract between a borrower, who pledges some property (usually the home he intends to purchase) as security, and a lending institution which provides the funds. If the borrower fails to repay the loan, the lender can foreclose the security and sell it to recover his loss.

Mortgage loans are originated by one of four types of lending institutions in North Carolina: commercial banks, saving and loan associations, life insurance companies and mortgage companies.

Savings and loan associations are specifically designed to channel funds into housing. Because of tradition, charter requirements, and Federal tax laws, they have a very limited number of investment outlets. Therefore, they invest 80 per cent of their assets in mortgage loans. Restricted to a one hundred mile operating area around their headquarters, savings and loan associations have developed a thorough knowledge of local credit conditions and have generally shunned government-assisted loan for low-income families.

Historically, commercial banks have provided developers with short-term funds for housing construction. By law and tradition, they have sought other outlets than home mortgages as investments for their saving deposits. However, commercial banks look favorably upon government-underwritten loans since these loans do not have to be counted as part of the mortgage total, which is limited by law. While

only about 10 per cent of a commercial bank's assets are held by its mortgage department, they are the second largest dealer in mortgages for 1-to-4 family homes, 25 per cent of which are government-insured.

Mortgage companies are essentially middlemen, originating loans for construction and home purchase and then selling these loans to institutional investors. The mortgage company may originate mortgages as a loan correspondent for commercial banks, upon whom they rely largely to finance their operations and mortgage inventory. Mortgage companies deal heavily in government insured loans for single family dwellings—70 per cent of all their residential loans are government-insured.

Life insurance companies generate an ever-increasing pool of funds, 35 per cent of which is invested in mortgage loan acquisition. Insurance companies use a system of mortgage correspondents (savings and loan associations, etc.) to originate and service mortgage loans. They, in turn, provide the mortgage funds and pay the correspondents to administer the loans. Insurance companies look very favorably on government-insured loans since they cannot afford to inspect the dwelling or interview the borrower. While insurance companies invest in mortgages only when the return will be higher than other outlets, approximately 40 per cent of their mortgages are government-insured.

Mortgage Amount

The amount of the mortgage will equal the cost of acquiring and improving a site, constructing a dwelling, and paying the home purchase closing costs. For single-family dwellings in the South, site costs average 17.5 per cent, while construction costs comprise 80 per cent, and closing costs 2.5 per cent of the mortgage amount. Upon determining the mortgage amount, the lending institution will request that the borrower pay a portion of the amount immediately so that, if for any reason, the bank must foreclose the mortgaged property, the funds put down by the borrower can be used to offset any loss the lender may incur in reselling the property.

The lender sets the amount of the down payment after examining the magnitude of the homeowner's existing debts, his monthly income, and the mortgage amount. The average down payments on new houses financed without government assistance by savings and loans are 24 per cent and by commercial banks 39 per cent.⁶ Such down payment policies impose a severe hardship on low income families, who, on the

average, have assets of less than \$1,000.⁷

To relieve the burden of large down payments, the FHA provides mortgage insurance in return for a ½ per cent annual premium for homes financed under its direction. If the homebuyer fails to repay his loan, the lender forecloses the mortgaged property, turning over title to the FHA. The FHA pays the lender the unpaid mortgage amount and sells the property to cover its losses. This insurance system has allowed lending institutions to reduce down payments on FHA loans to as low as five per cent.

Site Costs

With the gradual migration of the rural population in North Carolina to the major employment centers, the demand for residential land located near transportation facilities has substantially increased. Consequently, the cost of acquiring and improving sites for FHA single-family homes has risen from an average of \$1049 in 1948 to \$3544 in 1966.⁸ In proportion to the total purchase price of the dwelling, the site cost has increased from 12 per cent in 1948 to 17.5 per cent in 1967 (see Table 2).

TABLE 2

*Distribution of the Selling Price of a Typical Single-Family Home in North Carolina*¹

COST ITEM	AMOUNT	PERCENTAGE
Site Cost		
land acquisition	\$ 1,500	10.5 %
land improvements	1,000	7.0
Structural Cost		
materials	6,000	40.0
labor	3,000	20.0
Builder's Expenses		
profit	300	2.0
overhead	1,900	12.0
marketing	550	3.5
financing	750	5.0
TOTAL	\$ 15,000	100 %

¹ Three bedroom, 1000 sq. ft. home on a 15,000 sq. ft. lot.

Essentially, the proportion of the mortgage amount attributable to site costs depends on three factors: (1) the price of raw land, (2) the cost of land development, and (3) the amount of land used per dwelling. Sherman Maisel has determined that 52 per cent of the increase in site costs is attributable to rising land prices, 28 per cent to increased improvement costs, and 20 per cent was associated with changes in site size.⁹ The price of raw land represents the "fastest rising element" of all housing costs—since 1950 the purchase price of single-family dwellings has doubled, while the cost of land acquisition has tripled. Generally, this increase is a result of urban areas. The local government policy of zoning outlying areas for large lot developments has served to not only increase acquisition cost but also improvement costs. These improvement costs are incurred in preparing a site for construction and providing facilities such as water, sewer, roads, and lights. Generally, the initial capital investment in social infrastructure—schools, streets, and utilities—ranges from \$4,000 to \$6,000 per dwelling.

Large builders such as Levitt and Sons place great emphasis on efficient utilization of land and economics of site improvements in their proposals to reduce housing costs. If the zoning density is increased from the usual 2½ houses per acre to 10 houses per acre, Levitt believes that site costs can be cut in half.¹⁰ While such a reduction would result mainly from smaller sites, substantial cost decreases could be realized from large scale clearance, decreased front footage, and shorter utility connections. Since land represents only 17.5 per cent of the selling price of single-family homes, a 50 per cent reduction would result in an eight per cent decrease in selling price. More importantly, for conventionally financed FHA single-family homes, land costs represent only four per cent of the monthly housing payment (see Table 3). By cutting land costs in half, the consumer's monthly payment is reduced only two per cent.

In his study concerning the productivity of the housing industry, Richard Muth has noted that unless the increase in land costs is not curtailed reductions in other cost areas, *e.g.* construction cost, will be negated. Also, given the relatively fixed supply of land, a three per cent increase in the price of raw land will result with every ten per cent decline in construction costs.¹¹ This price rise will result from increased consumption resulting from construction costs reductions which will stimulate a larger volume of new construction.

While reducing the zoning restrictions will have some effect on land prices, major reductions will only be realized when large tracts of vacant land are aggregated by local governments and held over a period of years for future public-assisted housing. Such aggregation would require extensive land planning and budgetary policy alterations to produce public support for eminent domain.

Construction Costs

The major portion of the mortgage amount is utilized to construct the dwelling. The cost of construction may be subdivided into structural costs (materials and labor) and builder's expenses (profit, overhead, marketing, and financing) as shown in Table 2. Combined, these construction costs represent 80 per cent of the borrowed principal, but only 21 per cent of monthly housing payment for conventionally financed FHA single-family homes (see Table 3).

TABLE 3

Distribution of Monthly Costs for Conventionally Financed¹ FHA Single-Family Homes²

COST ITEM	PERCENTAGE
Principal	25 %
Site	4.2
Vertical Elements	5.7
Horizontal Elements	6.0
Utility Systems	6.7
Builder's Marketing and Financing	2.4
Interest	46
Insurance	2
Taxes	11
Maintenance	7
Utilities	9
TOTAL	100 %

1 30-year mortgage at 8½ per cent interest plus ½ per cent mortgage insurance premium and 5 per cent downpayment.

2 Average cost: \$ 20,468 for 3-bedroom home on a 15,000 sq. ft. lot.

Proposals for land banks, state-planned new towns, and similar recommendations have come from the Kaiser Commission and are being made by business groups and land economists.

First, structural costs may be divided into three categories: (1) horizontal elements comprised for foundation, floor, and roof, (2) vertical elements represented by walls (3) utility systems including appliances, heating, lighting, and water facilities. While the major ingredients of these elements are labor and materials, profit and overhead are usually computed as a percentage (25%) of labor and materials. An examination of the distribution of these construction expenses reveals that horizontal elements represent 25.5 per cent of the selling price, vertical elements 22 per cent, and utility systems 26.5 per cent as shown in Table 4. Together, these building costs comprise 74 per cent of the mortgage amount and about 18 per cent of the monthly payments for conventionally financed construction. Thus, if labor, materials, profit, and overhead could be reduced by 50 per cent, the monthly payment would be reduced by about nine per cent.

Today, most attempts at reducing the construction costs focus on labor expenses. In the last ten years average hourly wages for construction workers have risen four and one-half per cent a year.¹² As Richard Muth has noted, these increased wage rates of construction employees would have less effect on housing costs if a much greater proportion of house construction could be performed by manufacturing employees. This strategy makes sense, since the wage rate for manufacturing employees is only half that of construction workers.¹³ Such a transition to a "manufactured" home depends on a relaxation of present building practice constraints.

Generally, it is felt that the construction costs of single-family homes could not be reduced by more than 10 per cent unless new, substantially more efficient building methods such as serial production of major components or entire units under factory conditions is initiated. While wall panels and roof trusses are usually factory-built, most of the components of the home are assembled by skilled workers on the site.¹⁴ This process often requires three to four months to complete and limits the scale of operation to less than 100 homes a year.¹⁵ Ideally, the horizontal, vertical, and utility elements could be assembled under factory conditions, transported to the site, and erected to form the dwelling.

Since all the parts of the home could be made and assembled on production lines, unskilled workers could perform many of the required operations. While the need for large numbers of skilled workers will be reduced, the existing labor force can be used

TABLE 4

Typical Distribution of Structural Costs for Single-Family Houses in North Carolina

COST ITEM	MATERIAL	LABOR	PROFIT AND OVERHEAD	TOTAL	PERCENTAGE OF SELLING PRICE
Horizontal Elements					
Foundation-Floor				\$ 2000	13.0 %
excavating	\$ 365	\$ 165	\$ 130		
footing	115	25	35		
concrete work	410	230	160		
flooring	165	75	60		
Roof				1900	12.5
framing	600	295	205		
roofing	330	150	120		
insulation	50	10	15		
Subtotal	2035	950	725	3900	25.5
Vertical Elements					
Walls				3300	22.0
framing	550	215	180		
rough hardware	100	45	35		
windows and doors	125	55	45		
insulation	15	20	10		
painting	100	215	80		
dry wall	310	360	170		
ceramic tile	130	60	50		
trim	265	120	95		
Subtotal	1545	1090	665	3300	22.0
Utility Systems					
electrical	200	90	75		
plumbing	850	400	310		
heating	770	350	280		
appliances	230	10	85		
cabinets	270	20	70		
Subtotal	2320	870	820	4000	26.5
TOTAL	\$ 6000	\$ 3000	\$ 2200	\$ 11,200	74 %

much more efficiently. This is an important factor since the percentage of skilled workers in the labor force is steadily declining.¹⁶

While factory assembly of near-complete houses seems to hold the primary opportunity for increased productivity and lower costs, the benefits derived from the change to manufacturing must be substantial if the change is to be actually realized. Stockfish notes three types of savings that could be realized from factory production: (1) reduced labor input due to greater use of capital funds for machinery, greater division of labor, and the use of long assembly lines, (2) reduced average wage rate due to greater use of unskilled labor, (3) reduced price of materials due to sustained, large volume purchase.¹⁷

Cost reductions resulting from the transition to manufactured housing depends on the ability of builders to utilize the unskilled and semi-skilled labor force.

Some industrial firms maintain that the labor input for a factory-assembled house could be 70 per cent lower than that required to build a house on-site. Such a labor cost reduction could result in reducing the selling price 14 per cent and the monthly cost for single-family dwellings about three per cent.

To utilize unskilled and semi-skilled labor most effectively, a serial manufacturing operation is required. That is, material inventory is reduced by only producing the parts which are required for the assembly of a small number of house types. While certain parts of the houses (walls, floor, etc.) are constructed on short production lines, the large transportable house components are assembled on one major production line.

To construct the conventional home on-site requires a labor input of 500 man-hours usually at an average cost of \$6.00 per hour.¹⁸ By utilizing factory methods, construction time could be reduced to 275 man-hours. Semi-skilled workers paid at \$2.00 an hour could comprise 200 man-hours and skilled workers earning \$5.00 an hour would be utilized for 75 man-hours. As a result labor costs would be reduced from \$3000 in a conventional house to \$775 as shown in Table 5.

TABLE 5*Comparison of Conventional and Factory Housing Construction Costs*

COST ITEM	CONVENTIONAL	FACTORY ³
Site Cost		
land acquisition	\$ 1500	\$ 1500 ⁵
land improvements	1000	1000
Structural Cost		
materials	6000	5400 ⁵
labor	3000	775 ⁴
Builder Expenses		
profit	300	300
overhead	1900	1245
marketing	550	790 ²
financing	750	500
transportation	na	250 ¹
TOTAL	\$15,000	\$11,725

- 1 An average trip of 100 miles @ \$1.00 per mile is used, plus fixed costs of \$150 per haul.
- 2 Based on 10% of construction cost.
- 3 \$2 million would be required to tool-up the factory and \$1 million would be required to maintain an inventory that would sustain 1000 units a year.
- 4 200 man-hours at \$2.00 an hour and 75 man-hours at \$5.00 an hour.
- 5 Assumes that material and land prices can be held relatively constant with increased demand for new homes.

While factory assembly will produce only minimal reductions in the material costs per dwelling, it will allow many more homes to be built. Sherman Maisel has found that the large builder (100 or more units) can build the identical house for \$750 less than the small builder (1 to 24 units) by reducing labor and material costs.¹⁹ In contrast the large builder's overhead and profit were more than double that of the small builder. Obviously, costs do not decrease indefinitely with increasing output. John Herzog notes that the optimal scale probably "lies somewhere between 500 and 800 units per year."²⁰

Economies of scale in the purchase of materials can be realized by large builders through competitive bids submitted by material suppliers. Consequently, lumber, appliances, hardware, and other materials can be purchased in carload lots from producers.

A 10 per cent saving in the procurement costs of materials is possible by this process since the "mark-up" currently received by the existing retail and wholesale building material apparatus could be eliminated. However, if the demand for new homes increases substantially, the price of materials will also increase. Most economists believe that a 50 per cent increase in demand for building materials would stimulate a 25 per cent price rise. Consequently, if the housing production of the nation is to increase from 1.5 million units a year to 2.5 million, the effect of increased demand on material prices must be offset by government policy or price-induced reductions in other demands for these materials (commercial, military, etc.).²¹

While serial production would substantially alter construction costs, it will also change builder's expenses. The Douglas Commission reports that the average builder of single-family homes usually aims for a profit, marketing, and overhead fee of 15 to 20 per cent of the costs of labor and materials.²² From Table 5 we see that builders expenses for both types of construction are about \$2500 per house. The basic change will occur in the area of interim financing costs. Generally, money is required before the sale of the house to finance the purchase of materials and pay labor costs. The expenses are determined by the amount the builder must borrow, the length of the loan, discount points, and the interest rate. Thus, the cost of interim financing will increase as structural costs and construction time increase. However, by maintaining an inventory of building parts purchased in bulk at reduced rates with an annual materials-purchasing loan, the builder can reduce the financing costs that result from financing each construction individually. This reduction will be realized from decreases in handling charges from the lending institution and reductions in builder's administrative expenses. However, in large measure the reductions in financing and overhead will be negated by transportation costs and increased marketing expenses.

Before large amounts of capital can be expended for materials and machinery to produce factory components, the builders must be insured of an increased market with the ability to purchase the manufactured housing. In the past, housing markets have

been limited to local political jurisdictions—in North Carolina usually two or three counties. Generally, each county or city will have a non-standard building code, thus restricting the production of standard building components. In North Carolina there exists the potential for a uniform building code that could be enforced by inspectors overseeing the factory assembly.²³ Such inspection would enable the manufacturer to sell his homes in any part of the state.

Assuming that a standard building code could be enforced by state government and that additional capital could be generated by builders, the fact remains that many more families must be brought into the housing market. In 1960, there were approximately 880,000 families in North Carolina with incomes less than \$7,000, many of whom live in substandard housing.²⁴ Essentially, the task of builders is to develop a home which this vast market of low-income families can afford.

With a substantial labor cost reduction and volume savings on material prices, the construction cost of factory assembled homes could be 25 per cent less than conventional homes as shown in Table 5. However, factory production requires stable, continuous production runs to efficiently utilize labor and materials. To realize a continuous production of 800-1000 units a year, builders would necessarily need the advantage of an aggregated market. That is, assurance that a large number of homes could be erected in various locations and that funds would be available to finance the sale of these homes. A major constraint to aggregation is the ultimate impact on the construction industry. Aggregation suggests taking business away from small firms and giving it to bigger firms; modernization of technology suggests making obsolete some of the skills in the building; reform of building codes suggests limits on local authority.²⁵ While the prospects of private developers aggregating a large market are unfavorable, federally subsidized housing could stimulate large market aggregations if the goal (500,000 new units a year) of the 1968 Housing Act is attained. More importantly, unless large numbers of low income families can receive housing subsidies, the cost reductions resulting from factory assembly will only allow a family earning as low as \$7440 to purchase new housing (see Table 6). To lower monthly costs to a point where the family earning less than \$7,000 can afford new housing, federal subsidies are absolutely necessary. These subsidies are available through the Turnkey III and the FHA 235 home ownership programs and when combined with construction costs reductions resulting from factory assembly could produce substantial reductions in monthly housing payments.

TABLE 6

*Distribution of Monthly Costs for Factory Assembled Conventionally Financed
FHA Single-Family Home*

COST ITEM	AMOUNT	PERCENTAGE
Mortgage ¹		
. principal	\$ 31 1	20.0%
. interest	61	40.0
Insurance ²	5	2.0
Taxes ²	24	15.0
Maintenance ²	14	10.0
Utilities ²	20	13.0
TOTAL	\$ 155	100.0%
Family Income Required to Pay 25% for Housing	\$ 7,440	

1 Assumes a 5 per cent down payment, 30-year mortgage at 8½ per cent interest plus ½ per cent mortgage insurance for an \$11,725 house and land.

2 These costs are "fixed" and are computed on the basis of the average FHA home (\$20,468) sold in North Carolina.

Home Purchase Closing Costs

Many home buyers are largely unaware of the costs associated with arranging a mortgage loan. Often the buyer finds it necessary to borrow more money to finance the title insurance, lender's service charge, settlement fees, and pre-paid taxes and insurance. While closing costs amount to only two to three per cent of the mortgage amount, they have increased by 33 per cent in the last decade. ²⁶ Generally, closing costs are fixed and only through cooperation among lending institutions, attorneys, and local government could their effect be minimized. (See Table 7)

TABLE 7

Distribution of Home Purchase Closing Costs for Single-Family Homes in North Carolina

COST ITEM	HOME PURCHASE PRICE ⁵					
	\$9000	\$11000	\$13000	\$15000	\$17000	\$19000
Title Insurance ¹	39	46	53	60	67	74
Attorney's Fee ²	90	110	130	150	170	190
Lending Charges ³	90	110	130	150	170	190
Property Survey and Recording	35	35	35	35	35	35
Prepaid Taxes and Insurance ⁴	75	90	100	110	130	140
TOTAL	\$ 329	\$ 391	\$ 448	\$ 505	\$ 572	\$ 629

1 Title insurance equals \$3150 per \$1000 purchase price plus \$7.50 fixed fee.

2 Attorney's fees include preparation of deed and equals 1% of the purchase price.

3 Lending charges amount to 1% of the purchase price.

4 Homeowners insurance equals ½% of the purchase price.

5 Includes house and land.

Mortgage Term and Interest Rates

In the 1930's the FHA initiated the amortization system that allowed the borrower to make period payments to reduce the mortgage amount. The interest charged by lender is computed annually on the basis of the unpaid mortgage amount. The length of the mortgage term has a substantial effect on the level of monthly payments—the longer the term, the smaller the monthly payment. The reduction in monthly amortization payments that results from extended repayment terms outweighs the increased long-term cost for low income families. (Table 8)

TABLE 8

*Effect of Interest Rate and Amortization Period on Total Mortgage Cost
(Total Payments Per Thousand Dollars of Mortgage Amount Over the
Life of the Loan)*

INTEREST RATE	MORTGAGE TERM		
	10 YEARS	20 YEARS	30 YEARS
1%	\$1052	\$1104	\$1159
2%	1104	1214	1332
3%	1159	1332	1519
4%	1214	1454	1717
5%	1273	1584	1933
6%	1333	1720	2160
7%	1393	1860	2394
8%	1455	2006	2642
9%	1518	2157	2890

In North Carolina for mortgage loans of less than \$50,000 the maximum interest rate is 8 per cent.²⁷ This rate coincides with the 8½ per cent interest ceiling set by the FHA. However, for FHA loans, lenders have circumvented the ceiling by the "point" system of discounts. Discounting, where the borrower gets only a reduced percentage of the mortgage amount, has the effect of raising the yield and inducing the lender to make the loan. Generally, five or six discount points are charged by lenders in North Carolina for FHA-insured loans—thus the lender actually loans only 94-95% of the contract amount. The builder or seller, not the borrower, must make a cash payment when the loan is closed to make up the discount (discount payments are included in financing costs in Table 3). The builder in turn, increases the selling price to compensate for the discount he pays. This selling price increase has the effect of raising the contract interest rate from eight to eight and one-half per cent.

High interest rates have virtually eliminated families earning less than \$7,000 from the private market. In 1968, the median income of families receiving conventional FHA loans in North Carolina was \$12,177 and only 2.5 per cent of the FHA loans that year were made to families earning less than \$7,000.²⁸ For the average FHA

home built in 1969 (\$16,690) interest payments amount to 46 per cent of the monthly payment (see Table 1).

It is within this cost area that the government has directed its subsidy efforts, particularly the FHA 235 program. In 1963 William Grisby noted that an annual government expenditure in interest subsidies of less than half a billion dollars could support decent housing for the entire 2,500,000 low income families who would still be occupying substandard dwelling units in metropolitan areas in 1970.²⁹ In 1969 the federal government began to enact this strategy with the allocation of 140 million dollars in interest subsidies.

Fixed Costs (Insurance, Tax, Utilities, and Maintenance)

While monthly payments on the mortgage might be cut in half by reducing construction costs through industrialization, other housing expense items such as insurance, maintenance, utilities would remain unchanged, and local property taxes would still have to be maintained for the support of essential local services. For conventionally financed FHA homes these fixed costs comprise 29 per cent of the monthly payment (see Table 1).

First, the taxes collected from inexpensive houses tend to fall below the costs of public services to the occupants, especially if they are families with school children. For example, in North Carolina a \$15,000 house may be assessed at \$10,000 with a tax rate of \$25 per thousand. This yields the locality of \$250 a year in property taxes. A family with two children occupying such a house may require public expenditures of \$1,000 or more per year—\$400 for each school child plus \$200 for other services such as police protection, refuse collection, and street maintenance.³⁰ In North Carolina residential property comprises 41 per cent of property subject to taxation and provides local government with half its total revenue.³¹ As an increasing population is adequately housed—say through low cost industrialized housing—the demand for basic municipal services will increase. To meet this increase local governments will be hard pressed to generate adequate revenues. Consequently, low cost housing will be assessed at a higher value and tax rates will gradually increase.

Similarly, insurance costs are not likely to decline with any decrease in the selling price. The home owner's policy that provides protection from such hazards as fire, vandalism, and inclement weather is prorated on the basis of the selling price (\$3 per thousand). Premium rates are also dependent on the quality of construction and local fire and police protection facilities. To compensate for declining revenues that would result from lower sales prices, insurance companies would naturally increase their rates.

While a house may be viewed as an enclosure that may last from 30 to over 200 years, it does contain a number of sub-systems that have shorter lifetimes and incur operating expenses. The costs of heating, lighting, removing waste, providing water, and repairs and maintenance are largely dependent upon the activities of the family and the demand they place on the operating systems. However, as Ezra Ehrenkrantz has noted, there can be a wide range of "trade offs," between initial investment in construction costs and periodic payments to operate and maintain the structure.³² The importance of these trade-offs is particularly important since maintenance and utilities and construction costs of the dwelling both comprise 18 per cent of the monthly payment for conventional FHA single-family homes (see Table 3). While accurate information concerning maintenance and operating costs is virtually unavailable, the industrialization process must realize these viable trade-offs. Ideally, each piece of equipment and material should have maintenance and operating performance factors to indicate future expenses.

To afford the sixty dollar monthly fixed expenses that generally accompany home ownership, a family must earn at least \$2880 to allot 25 per cent of its income just for the fixed expenses. Consequently, if housing were given away, only families earning about \$3,000 would be able to afford the gift.

Federally Assisted Homeownership

In the last three years the federal government has initiated two homeownership programs for low income families—Section 235 administered by the FHA and FmHA and Turnkey III administered by the Housing Assistance Administration. The subsidies involved in both these programs are aimed at reducing interest costs. While economic data concerning these programs is scarce, it is possible to determine the range of families that can realize ownership with the available subsidies.

Turnkey III

The National Housing Act of 1937 established the legislation that provided the conceptual framework on which the low-rent public housing program was built. This legislation reflects an important political decision: while the program would be federally financed, it would be operated by Local Housing Authorities (LHA). Local authorities were established under state laws as autonomous public-corporate entities governed by a five member commission appointed by the local governing body. The legislation charged the local authorities with the task of (1) determining the number of families whose incomes were so low that they could not afford decent housing from the private market, (2) preparing plans to secure housing for low-incomes, (3) financing the capital costs of low-rent housing through long-term revenue bonds, and (4) manage the housing.³³ In preparing plans to accommodate the need for low-rent public housing, the local authority establishes family income limits and rent levels. To avoid competing with private housing, the maximum family income eligible for public housing must be 20 per cent less than the income required to pay the lowest rents at which "a substantial supply of decent, safe, and sanitary housing" is provided by the private market. Generally, rents average 20 per cent of annual family income and include maintenance, utilities, and real estate taxes. While the local authority employs an architect to prepare the housing design, the legislation specifies maximum construction costs. In North Carolina construction costs are limited to \$2500 per habitable room including the costs of acquiring and improving land.

The HAA lends the local authority funds to finance the acquisition and improvement of land and the construction of housing units. The housing authority issues revenue bonds which it sells on the stock market to repay the loan from the HAA. Normally, the interest rate on these bonds varies from six to seven per cent, however, in North Carolina the legal limit is six per cent.³⁴

Before the sale of the bonds, the HAA contracts with the local authority to provide annual payments to the purchasers of the bonds sufficient to retire the principal and interest over a 40-year period. It is this commitment by the federal government which makes it possible for the local authority to sell its revenue bonds. Generally, the bonds are purchased by wealthy investors, or financial institutions, who seek to benefit from the tax-exempt status of the bonds. That is to say, no federal income taxes are levied on the interest payments received by the investor, thus often pro-

ducing a 12 per cent return.³⁵

Since the annual HAA contributions cover the cost of land and construction, the rent levels established by the authority need only be sufficient to pay insurance, tax, maintenance, utility, and administrative costs. In effect, the federal contributions pay for the acquisition of the housing and the low-income families pay the expenses of the operation and management of the housing.

Until the last decade, the public housing program had not extensively utilized private enterprise. The local authorities purchased sites, administered the design, employed competitive contract bidding, and generally supervised the entire development. In 1967, the HAA initiated the "turnkey" technique of promoting the development and construction of public housing. Under the turnkey method, no local housing authority can solicit proposals from developers to build housing for low-income families.

If the developer's proposal (including site, plan, dwelling design, and construction costs) is acceptable to the local authority and the HAA, the authority will contract to purchase the completed housing for a stated price. This contract is underwritten by the financial commitment of the HAA to the local authority, and thus enables the developer to secure construction financing.

In the case of Turnkey III, a home ownership option is provided by the local authority.³⁵ Dwellings constructed under the Turnkey III program are financed on a 25-year basis, rather than the usual 40-year term. A proportionate share of the debt incurred through sale of bonds by the housing authority is assigned to each dwelling.

Under a home purchase agreement with the housing authority, a family makes monthly payments of 20 per cent of its adjusted income.³⁶ As a minimum, this payment must be sufficient to cover the fixed costs: (1) operating expense of the housing authority (including insurance, taxes, and administrative costs); (2) maintenance and repair costs; (3) utility cost. The responsibility for maintenance is given the occupant families. Consequently, the portion of the family's monthly payment allotted to maintenance is credited to a Homebuyer's Ownership Reserve.

Should the minimum 20 per cent monthly payment be large enough to exceed the fixed items indicated, the excess is utilized by the housing authority to reduce the government subsidy. Should the family have the desire to pay more than 20 per cent of its income, any of that excess not required for the three basic items will be credited to the Homebuyer's Ownership Reserve.

As the family builds up an Ownership Reserve, the proportionate indebtedness on dwelling is being reduced by the federal subsidy. When the Reserve has gotten large enough to cover the reduced indebtedness, the family applies the Reserve and purchases the house. In a case where the family realizes a substantial income increase such that the remaining indebtedness could be repaid via some alternative financing arrangement (FHA Section 235) the family will be required to complete the home purchase with that type of financing.

The housing authority controls the allowable minimum and maximum family incomes, and since \$3,300 is the minimum allowable income regardless of family size or home purchase price, it becomes the minimum income required to receive the maximum government subsidy as shown in Figure 2. Because utility and administrative costs are fixed by the LHA (see Table 9), excess payments resulting from paying 20 per cent of any income larger than \$3,300 go toward reducing the government subsidy. (See Appendix, Table A)

For instance, a family earning \$4,000 desiring to purchase a \$9,000 home would be required to pay \$66 a month (20 per cent). While \$55 would be used to pay the costs fixed by the housing authority, the remaining \$11 would be employed by the authority to reduce the government subsidy from \$41 to \$30. (See Table 9 and Figure 2)

Essentially, a substantial reduction in the purchase price resulting from industrialization under the Turnkey III program will only result in decreasing the amount of government subsidy. While having no effect on monthly payments, such a reduction in government subsidy required per family would allow the available subsidies to be spread over a larger market of low-income home buyers.³⁷

TABLE 9

Distribution of Monthly Costs for Single-Family Homes Financed Under the HAA Turnkey III Program in North Carolina

COST ITEM	HOME PURCHASE PRICE					
	\$9000	\$11000	\$13000	\$15000	\$17000	\$19000
Mortgage Cost ¹	\$ 60	\$ 73	\$ 85	\$ 100	\$ 112	\$ 125
Principal	29	36	42	49	55	62
Interest	31	37	43	51	57	63
Maximum	41	54	66	81	93	106
Government Subsidy ²						
Minimum	19	19	19	19	19	19
Homeowner's Reserve						
SUBTOTAL	60	73	85	100	112	125
LHA Administrative Costs (taxes, insurance, etc.)	16	16	16	16	16	16
Utilities ³	20	20	20	20	20	20
SUBTOTAL ⁵	55	55	55	55	55	55
Maintenance ⁴	14	14	14	14	14	14
TOTAL	\$ 69	\$ 69	\$ 69	\$ 69	\$ 69	\$ 69

1 Based on 25-year term at 6½ per cent interest with a \$200 down payment.

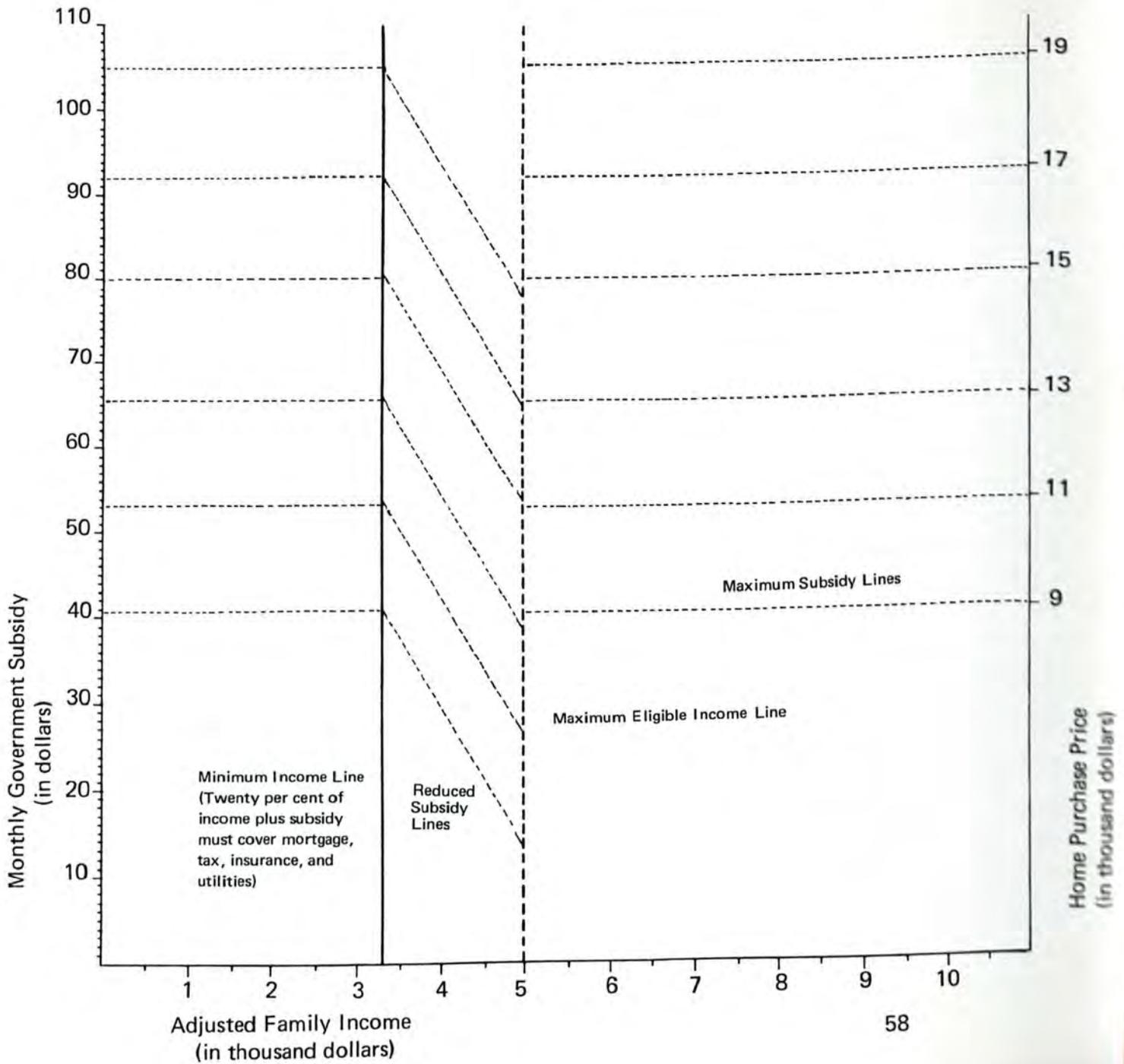
2 Based on \$3,300 income, any income higher will reduce this figure and increase reserve payment.

3 Established by the LHA.

4 Estimated for North Carolina.

5 Payments for Reserve, Administration, and Utilities should equal 20 per cent of family income.

FIGURE 2 Minimum Income Required to Receive the Maximum Government Subsidy Under the HAA Turnkey III Program for Various Priced Single-Family Dwellings



FHA Section 235

In 1968 the Congress established Section 235 of the National Housing Act to assist lower income families in acquiring home ownership. Prior to this landmark enactment, all major FHA subsidy programs were limited to rental units. The Kaiser Commission notes that appropriations are large enough to potentially house about 500,000 low income families in three years.³⁸ Generally, eligibility is limited to families with incomes less than \$8000.

Private developers will plan the housing and request approval from local FHA insuring offices for inclusion in the program prior to actual construction.⁴⁰ Once approval is received, the developer then can borrow funds to finance the acquisition of materials to construct the dwellings. When completed, the houses will be sold by the developer to low income families who will finance their purchases with FHA-insured mortgages from private lending institutions.

The minimum investment required for mortgages insured by the FHA under Section 235 is \$200. The lender has the discretion of using this investment to pay a portion of the closing costs or amortize the mortgage. Generally, this investment will cover only about half of the home purchase closing costs. The remainder of the closing costs is included in the mortgage amount to be amortized over 30 or 40 years. This extension of the liberal FHA downpayment policy allows many low income families who do not possess very minimal savings to be eligible for homeownership.

Financial assistance is provided under this program by HUD in the form of mortgage interest subsidy payments. These monthly payments are made to the lender on behalf of the home owner to reduce interest costs on a FHA insured mortgage to as low as one per cent. The subsidy provided by the interest reduction is the maximum subsidy available to low income families desiring a long-term loan. This fact is borne out by the requirement that each family pay 20 per cent of its gross adjusted income for mortgage, tax, and insurance costs.

In Figure 3 the minimum income required to receive the maximum subsidy—one per cent interest plan—has been compared with the home purchase price.

FIGURE 3 Minimum Income Required to Receive the Maximum Government Subsidy Under the FHA 235 Program for Various Priced Single-Family Dwellings

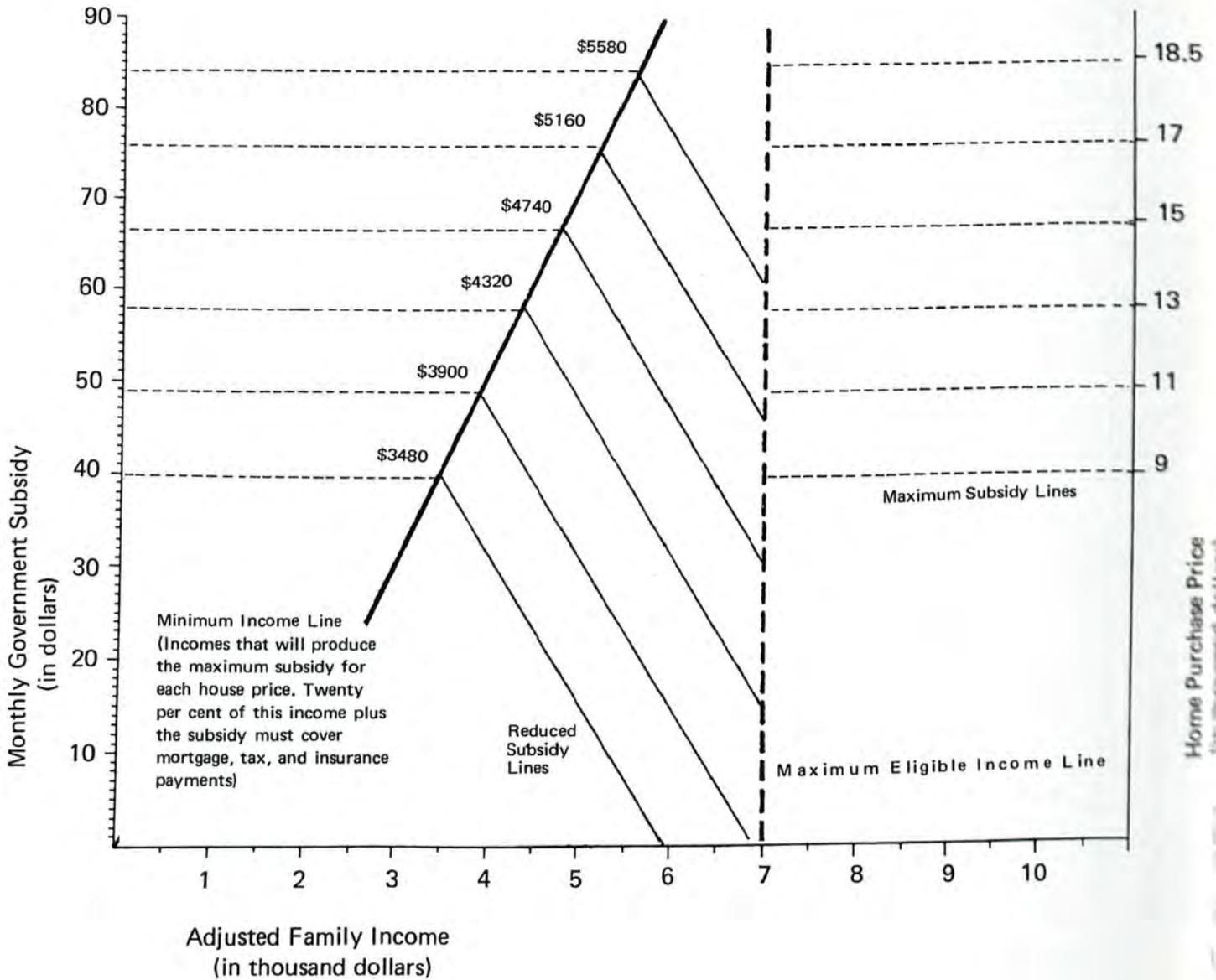


TABLE 10

Distribution of Monthly Costs for Single-Family Houses Financed Under the FHA Section 235 Program in North Carolina

COST ITEM	HOME PURCHASE PRICE					
	\$9000	\$11000	\$13000	\$15000	\$17000	\$18500
Mortgage Cost ¹	\$ 72	\$ 88	\$ 104	\$ 120	\$ 136	\$ 148
Principal	25	30	35	42	48	51
Interest	47	58	69	78	88	97
Insurance ³	4	4	4	4	4	5
Taxes ³	22	22	22	22	22	23
SUBTOTAL	98	114	130	146	162	176
Maximum Govern- ment Subsidy ²	40	49	58	67	76	83
Homeowner's Payment	58	65	72	79	86	93
Maintenance	14	14	14	14	14	14
Utilities	20	20	20	20	20	20
TOTAL	\$ 92	\$ 99	\$ 106	\$ 113	\$ 120	\$ 127
Minimum Adjusted Income ⁴ required to allot 20% to home- owner's payment	3480	3900	4320	4740	5160	5580
Minimum Adjusted Income required to allot 25% to housing expenses	\$4415	\$ 4750	\$ 5090	\$ 5425	\$ 5760	\$ 6095

1 Based on 30-year mortgage at 8½ per cent interest plus ½ per cent insurance premium with a \$200 down payment.

2 Utilizing subsidy available by reducing interest to 1 per cent.

3 Fixed on the basis of the average FAA single-family home built in North Carolina in 1969 (20, 648).

4 Adjusted family income refers to all income from all sources (head and/or spouse) minus \$300 for each minor.

The incomes along the diagonal minimum Income Lines are those which are necessary to obtain the maximum subsidy for each home value as indicated on the right vertical axis. If 20 per cent of a family's income will cover the mortgage, tax, and insurance costs then no government subsidy is required for the family to purchase the home (see the subtotal of these three costs in Table 10). The Maximum Subsidy Lines are correlated with the home purchase prices \$9-\$19,000. By tracing any specific Adjusted Family Income vertically, the amount of available subsidy can be seen in relation to family income and home purchase price. The vertical line at \$7000 indicates the maximum adjusted income eligible for the FHA 235 program.

Any family earning less than the minimum income required to receive the maximum subsidy for any specific home purchase price must allot more than 20 per cent of their adjusted income for mortgage, tax, and insurance expenses. In such cases, the FHA will probably declare the family ineligible for the program. (Appendix, Ex. 1)

It is interesting to note that while 20 per cent of the minimum adjusted income is employed to cover mortgage, tax, and insurance costs another 10 per cent is generally needed to pay maintenance and utility costs (see Table 10).

By providing a subsidy that reduces the interest rate to one per cent, the FHA 235 program decreases the monthly payment normally allotted to interest cost from 44 to five per cent. Assuming that the maximum subsidy can be utilized, the total monthly housing payments can be some 40 per cent less than those usually required under the conventional FHA program. More importantly, as a result of the interest subsidy, the proportion of the monthly payment allotted to repaying the principal increases from 25 to 42 per cent.

Therefore, cost reductions resulting from innovations in the design and construction of the dwelling will have a greater effect on the monthly payment.

Essentially, the most important factor in realizing cost reductions under the 235 program is the correlation of family income with home purchase price. If, through efficient market studies, the number of families eligible to receive maximum subsidies at different home purchase prices could be estimated, maximum utilization of the subsidies could be realized. However, from Table 10, we see that to reach families earning as little as \$4,000 a year, the home purchase price must be around

\$9,000, and even then the family would have to allot 29 per cent of its income to housing expenses.

While industrialization could produce a \$9,000 house, the FHA Section 235 program is generally geared to finance housing for those families earning from \$5,000 to \$7,000 annually.

FmHA Section 502

The Housing Act of 1949 established the Farmers Home Administration (FmHA) within the Department of Agriculture to make loans to farmowners to construct homes. In 1961 non-farm rural families in cities with populations of less than 5,500 became eligible for FmHA programs. Essentially, the FmHA operates as a lending institution providing mortgage money to homebuyers through a system of county agents. Rural housing loans are made by the FmHA to families who are unable to obtain mortgage financing from private lending institutions. To prevent foreclosures, the FmHA examines each loan application in detail; checking family income and other budget demands. Also, to be eligible for a FmHA loan, a homebuyer must "possess the character, ability and experience" to carry out the obligations of repaying a mortgage loan.

In 1968 the Section 502 program was established to make loans to low-and-moderate income rural families. Under this program, families earning an adjusted income of less than \$8000 can borrow up to \$16,000 over a period of 33 years at an interest rate of 7¼ per cent (see Table 11). Families with adjusted incomes of less than \$7000 are eligible for interest credit loans (Table D, Appendix). These lower income families are required to pay 20 per cent of their income for mortgage, tax and insurance payments. In the event that 20 per cent will not cover these costs, the FmHA will reduce the interest to as low as 1 per cent. The amount of the interest subsidy is directly proportional to the home purchase price and family income as shown in Figure 4.

TABLE 11

Distribution of Monthly Costs for Single-Family Homes Financed Under the FmHA Section 502 Interest Credit Program for Low Income Families¹

COST ITEM	HOME PURCHASE PRICE				
	9000	11000	13000	15000	17000
Mortgage Cost ²	\$ 61	\$ 75	\$ 88	\$ 102	\$ 116
Principal	25	31	36	42	47
Interest	36	44	52	60	69
Insurance ³	4	4	4	4	5
Taxes ³	18	18	18	19	21
Subtotal	83	97	110	125	142
Maximum ⁴ Government Subsidy	32	39	46	53	60
Homebuyer's Payment	51	58	64	72	82
Utilities ³	20	20	20	20	20
Maintenance ³	14	14	14	14	14
Total Monthly Payment	85	92	98	106	116
Adjusted Family Income Required to Allot 20% to Homebuyer's Payment	3060	3480	3900	4320	4920
Adjusted Family Income Required to Allot 25% to Housing Expenses	\$ 4080	\$ 4415	\$ 4750	\$ 5090	\$ 5570

¹ Adjusted family income must be less than \$7000.

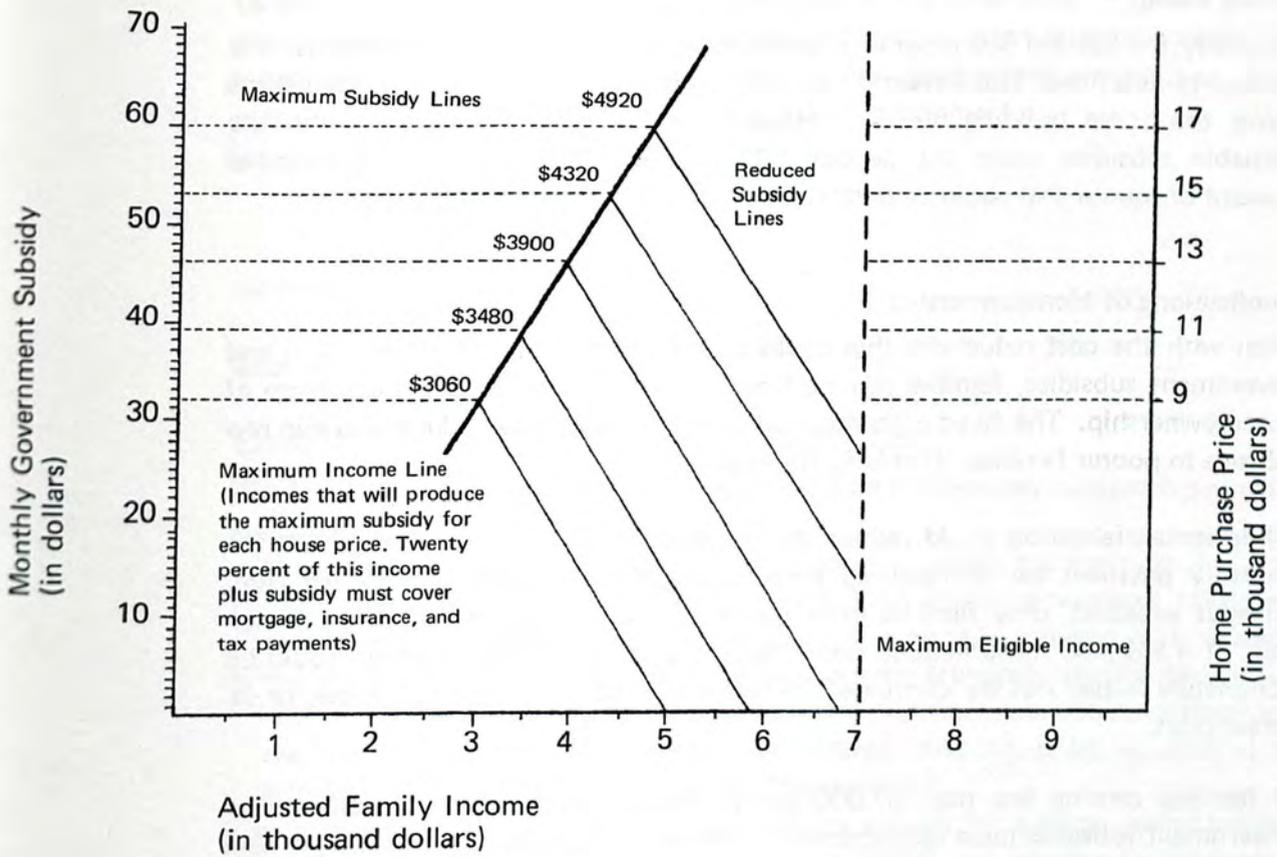
² Based on 30-year mortgage at 7%.

³ Fixed for the average home (\$12,340 plus land costs) financed by the FmHA in 1969.

⁴ Utilizing subsidy available by reducing the interest rate to 1%.

⁵ Adjusted family income equal all income from all sources (head and/or spouse) minus 5% and \$300 for each person under 21.

FIGURE 4 Minimum Income Required to Receive the Maximum Government Subsidy Under the FmHA 502 Program for Various Priced Single Family Dwellings



In 1969 the FmHA made 4570 housing loans in North Carolina under the Section 502 program - 862 of which were interest credit loans. This total is expected to double in 1970 with the \$84 million appropriation allotted to North Carolina. While the average family receiving FmHA loans earned a gross income of \$5646 in 1969, 16 per cent of the Section 502 loans were made to families earning less than \$4000 a year.³⁹

Generally, the Section 502 program is geared to build homes in small increments - one to twenty at a time. This limitation curtails large scale development and often slows down the home building process. However, industrialization coupled with the available subsidies under the Section 502 program could produce a substantial amount of homes that could be purchased by families in the \$3-4000 range.

Implications of Homeownership

Even with the cost reductions that could be realized through industrialization and government subsidies, families earning less than \$3,300 cannot afford any form of home ownership. The fixed costs incurred in operating a home make ownership prohibitive to poorer families. (Table E, Appendix)

While industrialization could reduce the purchase price of homes 30 per cent, the monthly payment for non-assisted housing would be reduced only 22 per cent. Without subsidies, only families earning over \$7,000 could possibly realize ownership of a \$12,000 manufactured home. Such a price reduction, however, could be completely wiped out by continued increases in land costs, material prices, or interest rates.

If families earning less than \$7,000 are to have an opportunity for ownership, government subsidies must be employed to reduce monthly payments to 25 per cent of family income. Reductions in the home purchase price could spread the available subsidies over a larger market of low income families, but increased subsidy allocations from Congress are necessary if the goal of 600,000 subsidized units a year is to be realized.

Generally, ownership of new construction should be viewed by planners as only one alternative to the low income family. While very poor families must be renters,

families in the \$3,300-\$7,000 range should be presented with the alternatives of purchasing or renting new or used housing. It is the role of the planner to present these alternatives to low income families and let them determine the usage of the government subsidies available to them. Such a strategy necessitates making the various alternatives viable, realistic opportunities. That is, a system which can deliver decent housing immediately must be organized at the local level.⁴⁰ Local government, lending institutions, private investors, and home builders must all cooperate in organizing and implementing a program to utilize government programs to insure every family a decent home and suitable living environment.

APPENDIX

Example 1

Example of Subsidy Calculation for FHA Section 235:

The HUD Handbook for Section 235 provides that the monthly assistance payments are computed on the basis of the *lesser* of:

- a. the difference between the total monthly payment under the mortgage for principal, interest (at market rate of 8 per cent), FHA insurance premium, taxes, and hazard insurance, and 20 per cent of the home owner's adjusted gross income.
- b. the difference between the monthly payment to principal, interest (at market rate of 8½ per cent), and mortgage insurance premium under the mortgage and the monthly payment of principal and interest that would be required at an interest rate of one per cent, excluding FHA premium.

For instance, we would compute the maximum subsidy for a home owner earning an "adjusted gross income" (see Table B) of \$4000 and wanting to purchase a \$9000 home with a 30-year mortgage. Using formula (a): First, compute 20 per cent of the adjusted family income,

$$\$4000 \times 20\% = \frac{\$800}{12 \text{ mos.}} = \$66 \text{ per month provided by the home owner.}$$

Then, extract the subtotal (\$98) of the mortgage, tax, and insurance costs for a \$9000 dwelling from Table 10. Finally, the government subsidy using formula (a) is \$98 - \$65 or \$33.

Using formula (b): First, from Table C, \$3.22 is the factor for computing the monthly payment to principal and interest at 1 per cent for a 30-year mortgage. This figure must be multiplied by the number of thousand dollars in the mortgage (9). Hence, the monthly payment at 1 per cent would be, $3.22 \times 9 = \$29$.

The monthly payment for principal and interest at market rate (8½ per cent) plus mortgage insurance (½ per cent) for the \$9000 mortgage for 30 years would be \$72. Hence, the government subsidy using formula (b) would be $\$72 - \$29 = \$43$. Since formula (a) produced the smaller subsidy, it becomes the maximum subsidy. Consequently, a possible government subsidy of \$30 per month was not utilized by the \$4000 family. Ideally, the family earning \$4000 could utilize 100 per cent of the possible available subsidy (\$58) by purchasing a \$13,000 house as shown in Table 10 at a total monthly cost of \$106. This \$106 expense is only slightly greater than the \$99 payment (\$65 plus \$34 for maintenance and utilities) required for a \$4000 family purchasing a \$9000 home with the \$33/month subsidy. Hence, by paying \$7 a month more and utilizing the total subsidy available via formula (b) the \$4000 family can purchase a home valued at \$4000 more.

TABLE A

Monthly Payments for Various Family Incomes for Single Family Homes Financed Under the HAA Turnkey III Program in North Carolina

ADJUSTED FAMILY INCOME ²	MONTHLY PAYMENT ³	PER CENT OF INCOME
\$ 3300	\$ 69	25 %
3500	72	25
4000	81	24
4500	89	24
5000	97	23

¹ Regardless of Home Purchase Price.

² Adjusted Family Income refers to all income from all sources for each member, minus 10% and with an exemption of \$100 for each dependent other than the head or spouse.

³ Includes ownership reserve, administrative, utility, and maintenance expense less subsidy.

TABLE B

Monthly Payments for Various Family Incomes for Single Family Homes Financed Under the FHA Section 235 Program in North Carolina

HOME PURCHASE PRICE	ADJUSTED FAMILY INCOME ¹							
	3500	4000	4500	5000	5500	6000	6500	7000
\$9000	\$ 92	\$101	\$110	\$117	\$125	\$132	\$132	\$132
Per cent of Income	31%	30%	30%	28%	27%	27%	25%	23%
\$11,000	\$ 99	\$ 97	\$110	\$117	\$125	\$132	\$141	\$148
Per cent of Income	34%	29%	30%	28%	27%	27%	26%	25%
\$13,000	\$106	\$106	\$110	\$117	\$125	\$132	\$141	\$148
Per cent of Income	36%	32%	30%	28%	27%	27%	26%	25%
\$15,000	\$113	\$113	\$113	\$117	\$125	\$132	\$141	\$148
Per cent of Income	38%	34%	31%	28%	27%	27%	26%	25%
\$17,000	\$120	\$120	\$120	\$120	\$126	\$132	\$141	\$148
Per cent of Income	41%	36%	29%	29%	27%	27%	26%	25%
\$18,500	\$127	\$127	\$127	\$127	\$127	\$132	\$141	\$148
Per cent of Income	43%	38%	33%	31%	27%	27%	26%	25%

¹ Adjusted family income equals all income from all sources (head and/or spouse), minus \$300 for each child under 21.

TABLE C

*Effect of Interest Rate and Amortization Period on Monthly Mortgage Cost
(Monthly Payments per Thousand Dollars of Mortgage Amount)*

INTEREST RATE	MORTGAGE TERM		
	10 YEARS	20 YEARS	30 YEARS
1%	\$ 8.77	\$ 4.60	\$ 3.22
2%	9.20	5.06	3.70
3%	9.66	5.55	4.22
4%	10.12	6.06	4.77
5%	10.61	6.60	5.37
6%	11.11	7.17	6.00
7%	11.61	7.75	6.65
7%	12.13	8.36	7.33
8%	12.65	8.99	8.03

TABLE D

Monthly Payments for Various Family Incomes for Single Family Homes Financed Under the FmHA Section 502 Program in North Carolina

HOME PURCHASE PRICE	ADJUSTED FAMILY INCOME ¹									
	3000	3500	4000	4500	5000	5500	6000	6500	7000	
\$9000	\$ 85	\$ 93	\$101	\$111	\$117	\$117	\$117	\$117	\$117	\$117
Per cent of Income	34%	32%	30%	29%	28%	25%	23%	22%	20%	
\$11,000	\$ 92	\$ 92	\$101	\$110	\$116	\$124	\$131	\$131	\$131	
Per cent of Income	36%	32%	30%	29%	27%	26%	25%	24%	22%	
\$13,000	\$ 98	\$ 98	\$ 98	\$108	\$116	\$124	\$132	\$142	\$142	
Per cent of Income	39%	33%	29%	28%	27%	26%	26%	26%	25%	
\$15,000	\$106	\$106	\$106	\$109	\$116	\$124	\$132	\$142	\$150	
Per cent of Income	42%	36%	31%	28%	27%	26%	26%	26%	26%	
\$17,000	\$116	\$116	\$116	\$116	\$116	\$125	\$133	\$143	\$150	
Per cent of Income	46%	40%	35%	31%	27%	26%	26%	26%	27%	

¹ Adjusted family income equals all income from all sources (head and/or spouse) minus 5% and with a \$300 exemption for each child under 21.

TABLE E

Maximum Adjusted Income Limits for Various Government Housing Programs in North Carolina

FAMILY SIZE	GOVERNMENT HOUSING PROGRAM		
	TURNKEY III ¹	SECTION 235 ²	SECTION 502 ³
1	—	\$ 4590	\$ 7000
2	\$ 3900	4590	7000
3	4100	4890	7000
4	4300	5190	7000
5	4500	5760	7000
6	4700	6330	7000
7	4900	6630	7000
8	5100	6630	7000
9	5200	6630	7000
10	5200	6630	7000

¹ Adjusted income equals all income from all sources for each member minus 10% and with an exemption of \$100 for each child under 21.

² Adjusted income equals all income from all sources for each member with an exemption of \$300 for each child under 21.

³ Adjusted income equals all income from all sources for each member minus 5% and with an exemption of \$300 for each child under 21.

Mobile Home Ownership

In 1970 the congress passed legislation approving mortgage insurance for mobile homes under the FHA Title I home improvement program. Thus, the sale of mobile homes could be financed with 12-year mortgages amounting to as much as \$10,000 at an interest rate of 6¼ per cent.

TABLE F

Distribution of the Monthly Costs of Mobile Homes Financed Under FHA Home Improvement Program in North Carolina

COST ITEM	MOBILE HOME PURCHASE PRICE ¹			
	4000	6000	8000	10,000
Mortgage ²				
Principal	\$ 28	\$ 42	\$ 55	\$ 70
Interest	12	18	24	29
Insurance ³	3	3	3	3
Taxes ³	4	4	4	4
Maintenance ³	5	5	5	5
Utilities ³	15	15	15	15
Site Rent ³	30	30	30	30
Total Monthly Payment	\$ 97	\$ 117	\$ 136	\$ 156
Income Required to Allot 25% to Housing Expenses	\$ 4655	\$ 5615	\$ 6530	\$ 7490

¹ Includes cost of mobile home and closing costs.

² Based on 12-year mortgage at 6¼ per cent interest with no down payment.

³ Estimated for North Carolina.

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35. Turnkey I is used to define the local housing authority's purchase of completed housing built by private enterprise as a package. The local authority then rents the housing and manages its operation. Under Turnkey II the local authority purchases the completed housing and rents the units, but the management is handled by private enterprise.
36. Families may move into homes financed under Turnkey III as renters. When they earn \$200 by doing the required home maintenance (about 10 months), they are eligible for the Home Purchase Agreement. Eligibility can be assumed by paying the \$200 when the family moves in.
37. Michael A. Stegman, "The New Mythology of Housing" in *Trans-Action* (January 1970), p. 61.
38. The President's Committee on Urban Housing, *A Decent Home* (Washington: Government Printing Office, 1969, p. 66). This estimate assumes that the average subsidy per house will be \$50 a month.
39. The Farm Home Administration has been authorized by the Congress to administer the Section 235 program in rural areas. Hence, homebuilders operating in these areas will request approval from county FmHA agents.
40. Michael A. Stegman, "Kaiser, Douglas, and Kerner on Low-Income Housing Policy" in the *American Institute of Planners Journal*, (November 1969), p. 427.

FmHA Housing Project, Raeford

Scott Heacock, John Sinnett

The Farmers Home Administration, under the provisions of the Housing Act of 1949 as amended, makes and insures rural housing loans. These loans are made to residents of rural areas having a population of not more than 5,500 which are not closely associated with rural centers. Funds may be used to finance dwellings, building sites, and essential farm service buildings. Loan funds may also be used to buy an existing house and lot or to buy a minimum adequate site on which to build the home. Farmers Home Administration makes insured loans for the construction of housing for domestic farm labor to farmowners, associations of farmers, and states or political subdivisions thereof. Loans may also be made to provide rental or cooperatively owned housing in rural areas when sponsored by broadly based nonprofit associations. Housing credit also is extended to groups of low-income rural families who through a "self-help" housing program work together on the construction of their homes, and thus reduce the cash cost of their homes. One of the rural housing loan purposes is to help check the flow of rural people to urban areas. Rural housing loans also stimulate economic activity in rural communities by increasing employment.

Eligibility for Farmers Home Administration loans is determined by a three member county board. To be eligible, an applicant must:

1. Own a minimum adequate building site when the loan is closed.
2. Be without decent, safe, and sanitary housing.
3. Be unable to finance the needed improvements with his own resources or with credit from other sources.
4. Have sufficient income to pay operating and family living expenses, and meet payments on debts, including the proposed rural housing loan.

5. Possess the ability to carry out the undertakings and obligations required of him in connection with a housing loan.

The county board also determines the eligibility of low income families for interest credits. Families which do not have sufficient income to meet payments on a housing loan can qualify for interest subsidies. The actual amount of interest that a low income family will pay will depend upon the size of the family but in no case will it result in an interest rate of less than two percent. The maximum repayment term is 33 years. Homes for families with low or moderate income must be modest in size and of moderate cost. Loans average \$10,000 and vary in size depending on the needs of the applicants. New homes average about 1,200 square feet of living area. Although Farmers Home Administration has a limited number of plans available, applicants are expected to furnish detailed building plans obtained from any reliable source if other design solutions are desired. The Farmers Home Administration reviews the plans and inspects the construction as it progresses in order to help the borrower obtain sound and acceptable construction. The applicant must pay for all legal services necessary to guarantee a clear title to the site and facilitate closing the loan.

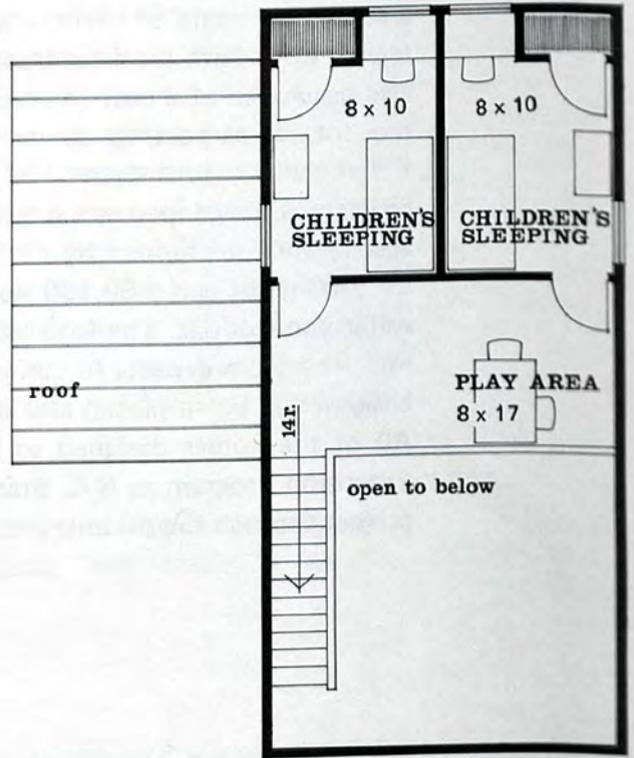
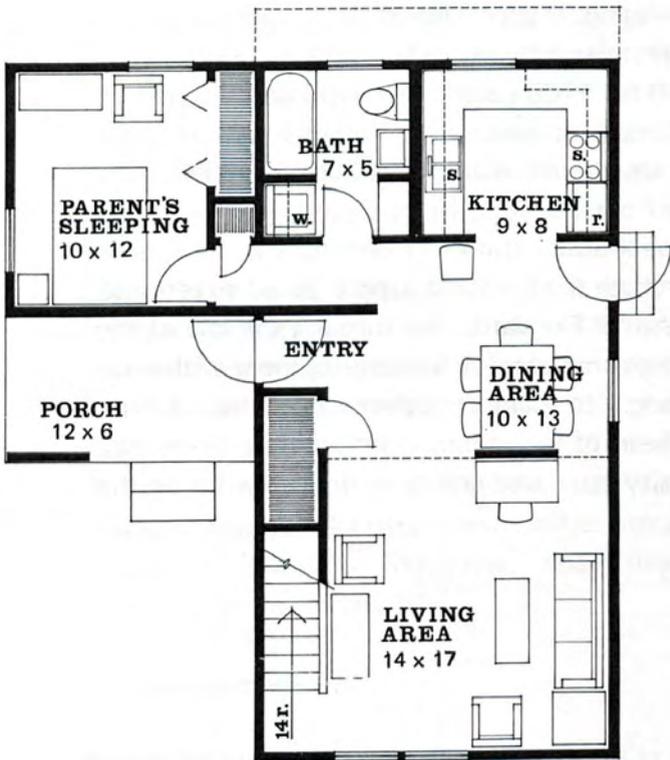
Loan programs make rural communities attractive locations for the development and expansion of rural industries, raise living standards, and create a healthy environment for family life.

Raeford Involvement

Past attempts to finance low-cost housing in Hoke County, North Carolina, had been thwarted for years by a severe lack of building sites. In an effort to alleviate this condition, FHA purchased a nine acre site. By adjusting the cost of the lots they were able to finance ample water supply, paved streets, and improved sites for 18 families. In an effort to develop this neighborhood as a model housing project, the local director requested that CDG be responsible for the design development; thus the team assigned to handle the project became involved in four areas: (a) public relations, (b) site development, (c) unit design, and (d) contractor coordination.

The public relations role was to stimulate interest in prospective applicants for the

model dwellings. In developing the site, the team had concentrated on house forms and siting more compatible with the users needs and requirements than traditional tract housing developments. The emphasis in housing design has been on three areas: first, to provide the owner with a program which meets his needs; second, to provide a variety of economical solutions through the use of variations on three basic schemes; third, to introduce a quality of architecture previously unavailable in this area and to create an environment encouraging its appreciation. By coordinating the team's work with local contractors, the first three-bedroom house to be constructed was developed at a cost of under \$12,000 for 1100 square feet including the cost of the lot, a carport, a sewer system, and the house. All indications are that the remaining prototypes will also be developed within allowable budgets. The project was developed as a subdivision by Forward, Inc., Hoke County's anti-poverty agency and was funded by Farmers Home Administration. Forward, Inc. received a \$10,000 grant and a \$9,100 loan to purchase the land and supply paved streets and water connections. The loan will be repaid to Forward, Inc. through the sale of the lots. The team expects to design five to eight houses, for the development with each basic design being placed at a different angle to make it appear to be a new design. All of the homes designed so far have been of wood construction. The University Extension Program at N.C. State University approved grants to finance work on the project through the summer.

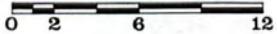


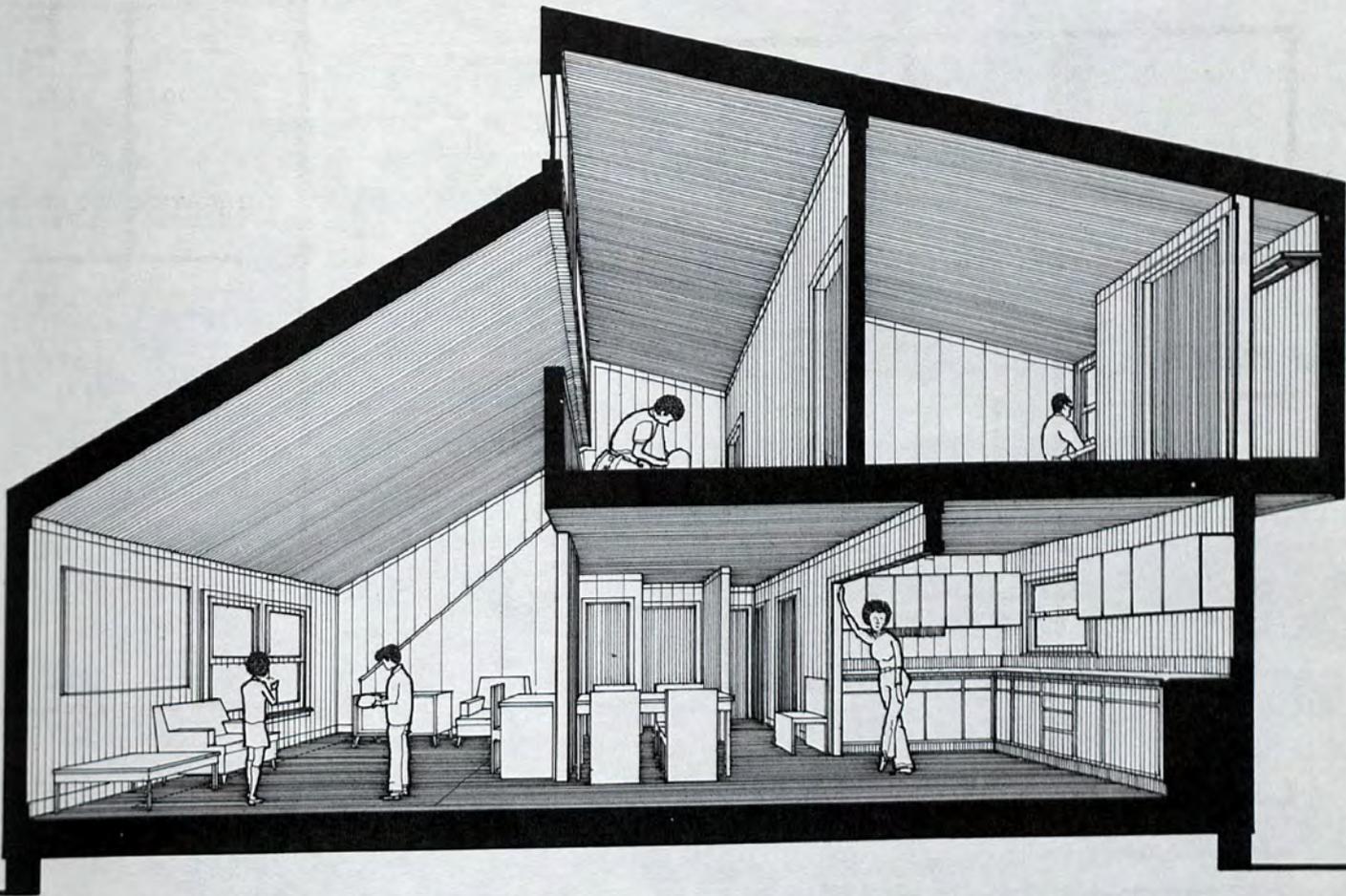
LOWER FLOOR

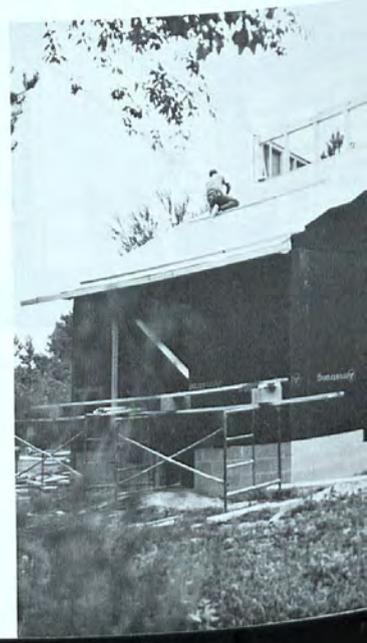
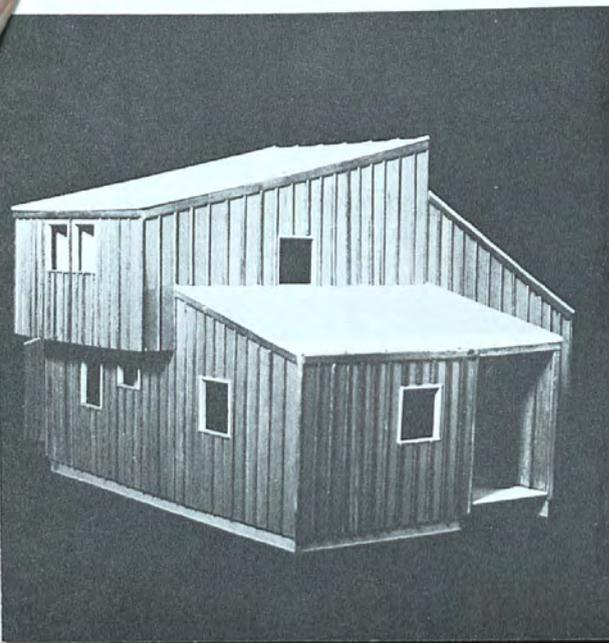
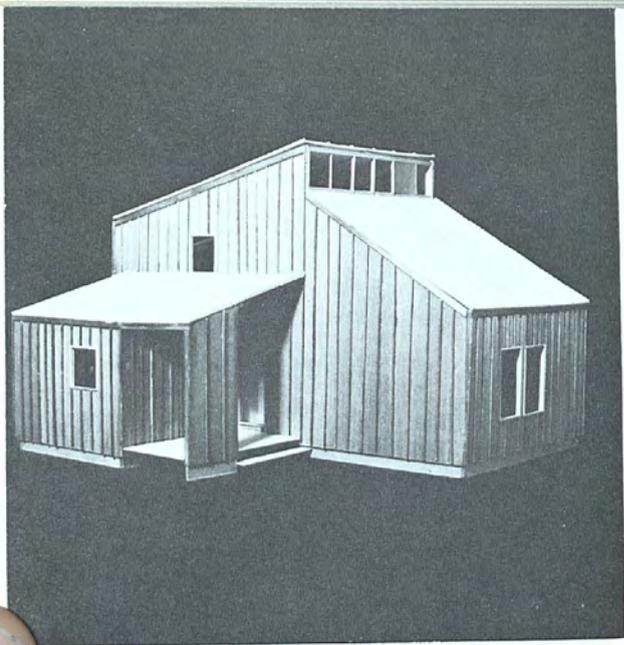
UPPER FLOOR

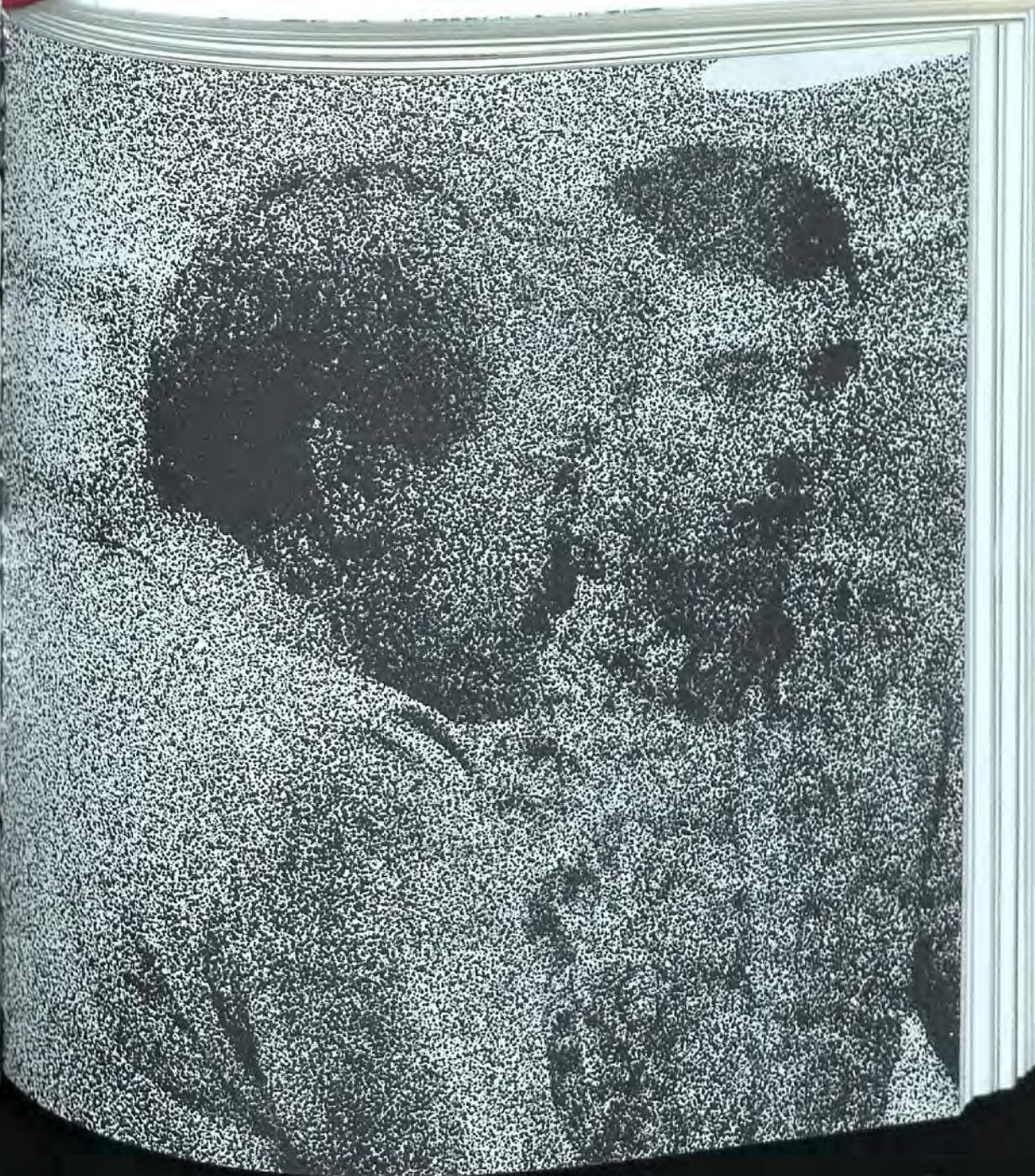
1090 sq ft

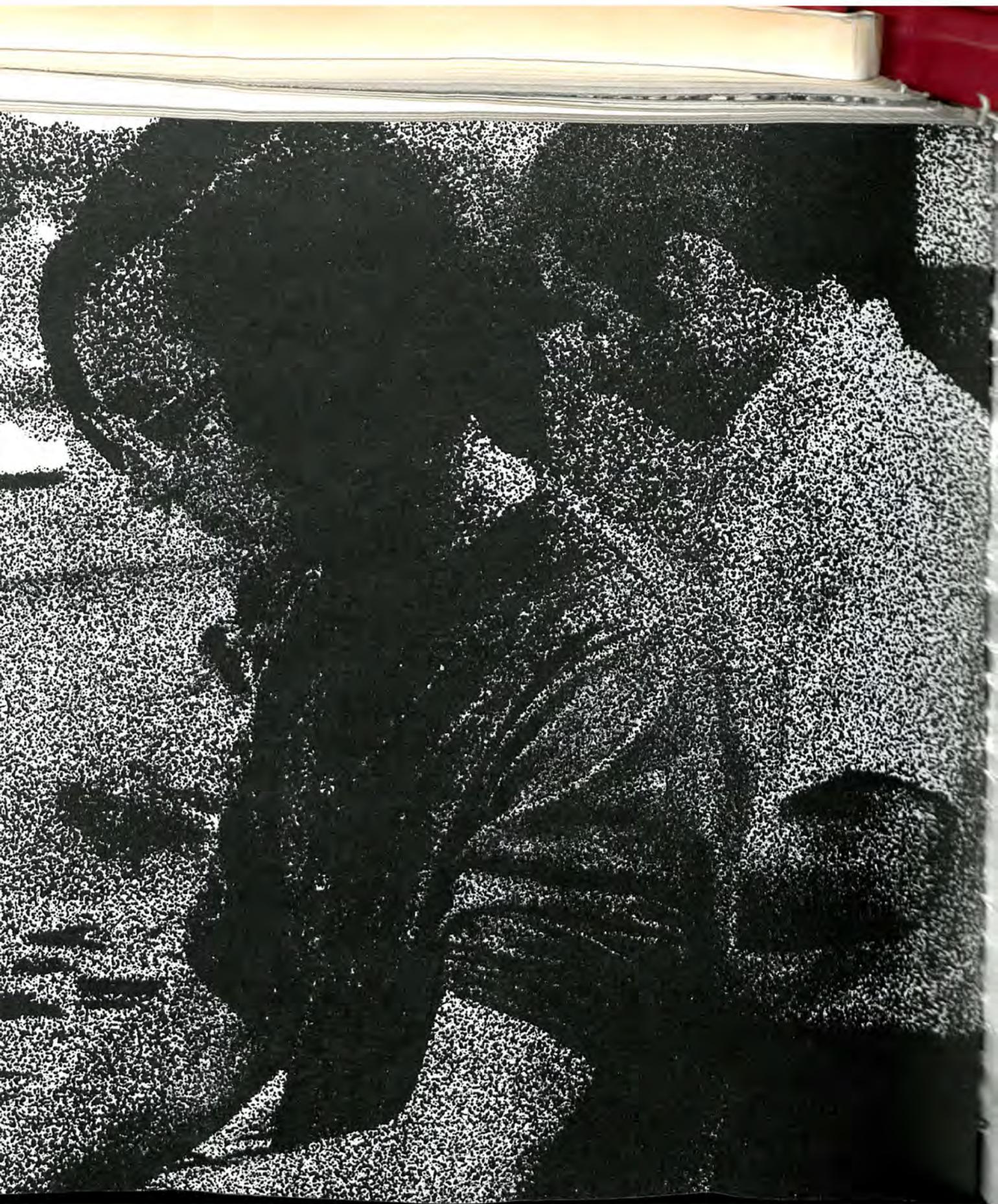
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An Assessment of Child Care Needs in Winston-Salem

Dixon Hanna, John Hitch, Theresa Raper

In establishing planning guidelines for a comprehensive child care program, a quantitative study of certain existing social and economic conditions was required. The study team in conjunction with the Learning Institute of North Carolina (LINC), the agency responsible for the development of the comprehensive program, collected and analyzed data which were used for recommendations for action and specific suggestions for county-wide child care coordination and community child care centers.

The analysis of the child care programs in Winston-Salem and Forsyth County developed into six basic studies. They were as follows: 1) number of children in the county under six, 2) number of children under six being served by some type of child care center and location of centers, 3) analysis of the social and economic conditions in Winston-Salem Community Renewal Program (CRP) neighborhoods which have a relationship to the need for outside-the-home child care services, 4) identification of the neighborhoods having a high priority of need for expanded child care services, and 5) coordination and training resources presently available in Forsyth County for child care.

Number and Location of Children Below the Age of Six

Since up-to-date census data was not available, estimates of the number of children below the age of six were figured on the basis of extrapolations from earlier census data, live birth rate estimates, and first grade public school attendance information. The figure determined was 23,000 children, of which thirteen to fifteen thousand live within the corporate limits of Winston-Salem. (Eight to ten thousand live in the county area outside the corporate limits.)

Additional information concerning the numbers of children is contained in Table I which shows the estimated live births in the twenty Winston-Salem neighborhoods from 1964 through 1969 (indicating an approximate number of children in the under six age group). The moderate discrepancy between the total number of children indicated in Table I and the figures for the city which were stated earlier, could be due to suburban out-migration, urban renewal-relocation programs, etc.

TABLE 1 ·

"Best" Estimate of Live Births From 1964 to 1969 in 20 Winston-Salem Neighborhoods

Neighborhood	1964	1965	1966	1967	1968	1969	Total 0 - 5 yr. old in neighborhood
1A	138	143	148	153	158	164	904—
1B	162	168	174	180	186	173	1,043—
2	158	164	170	176	182	188	1,038—
3A	96	99	102	106	109	113	625
3B	101	105	109	113	117	121	666
4	180	186	193	200	207	213	1,179—
5A	177	183	189	196	103	107	955—
5B	93	96	99	102	106	109	605
6A	161	167	173	179	185	194	1,059—
6B	153	158	164	170	176	182	1,003—
7	138	143	148	153	158	164	904—
8	109	113	117	121	125	129	714
9	86	89	92	95	98	101	561
10A	124	128	133	138	142	147	812
10B	124	128	132	137	142	147	810
11A	105	109	112	117	121	125	690
11B	122	126	130	135	140	145	798
11C	70	72	75	78	81	85	461
12	119	123	127	131	136	141	777
13	142	147	152	157	162	168	928
					TOTAL		16,532

Current Provisions for Child Care

Current studies show that there are 43 child care centers operating in the Winston-Salem/Forsyth area. These centers range in enrollment from six to 130 children and serve infants to six-year olds during school hours. (In some cases the centers serve older children after school hours.)

Map 2 shows the location of existing child care centers in the Winston-Salem neighborhoods. While a large portion of the centers are located in the densely populated areas of the inner city, a very small percentage of the children from these areas are actually being served.

Approximately two thousand children are currently enrolled in child care centers in Forsyth County. These children range in age from one month to six years. Approximately two thousand additional four-, five-, and six-year olds are enrolled in kindergartens, Head Start programs, and special projects such as a preschool operated by the Winston-Salem/Forsyth Schools. Thus, of the 23,000 children "eligible" for enrollment in some form of program, only 4,000 are presently being served. It is equally important to note that there is no balance between the density of children and the location of existing centers.

No effort has been made by the study team to evaluate the quality of child care provided by the present centers. It is certain that there is a wide variation in the quality of programs provided. It is felt that there is a significant shortage of infant care capability in the existing programs. Of the fourteen centers licensed by the North Carolina Department of Social Services, none indicate that infant care is provided. Few of the day care centers or kindergarten programs provide any kind of program for the after-school hours for older children. Additionally, it should be remembered that a large portion of the 4,000 children presently being served are in kindergarten programs which operate only three to four hours for five days per week during the school year.

Social and Economic Conditions Relating to the Need for Child Care Services

It was apparent that the needs for additional child care opportunities in the Winston-Salem/Forsyth area are so great that all of them cannot be met in the immediate future. In order to determine the areas of greatest need for expanded child care programs (assuming these areas would receive immediate attention), a study was made of demographic information provided by the CRP report. This information was available for the Winston-Salem area only.

Seventeen demographic variables were studied as a part of the assessment of needs.

The seventeen variables used in this study were: 1) Residential Density, 2) Residential Density at Saturation, 3) Residential Construction, 4) Population Density, 5) Rate of Illegitimate Births, 6) Location of Major Crimes, 7) Location of Major Crime Offenders, 8) Location of Juvenile Crime Offenders, 9) Number of Blue Collar Workers, 10) Blue Collar Workers at the City Rate, 11) Accentuated Middle Income, 12) Families Receiving Aid from Families with Dependent Children (AFDC) Funds, 13) Accentuated Low Income, 14) Accentuated High Income, 15) Number Infant Deaths, 16) Degree of Substandard Housing, and 17) Density of Experienced Unemployed Workers.

The density or degree of these variables for the twenty neighborhoods were analyzed. The magnitude of density of each variable in a neighborhood was rated on a scale of one to five. Each neighborhood was given a sum score based on the total rate or density of all variables considered. From this sum the neighborhoods were given scores and a 1, 2, or 3 "priority" indicating the necessity for immediate action in the neighborhood.

Six of the variables seemed to be more closely related to the need for child care centers. These were given primary importance (a weighted score of double value) and the neighborhoods with the greatest "need" scores were identified. The six variables used for this determination were:

1. Population Density
2. Location of Juvenile Crime Offenders
3. Location of Aid to Families with Dependent Children (AFDC)
4. Low Income Families
5. Location of Experienced Unemployed
6. Blue Collar Workers

Each of these variables has a logical and rational relationship to the need for child care facilities. Population density indicates where the people live. Low income and AFDC families are most likely to need child care in order for both parents of a family or for the female head of a household to be able to work. Location of experienced unemployed indicates where labor is available and where there are potential employees if child care were available. Location of juvenile crime offenders has relevance to the need for opportunity, health and education during the critical value-forming years of childhood and for engagement in productive activity during the after-school hours.

Using this criteria, neighborhoods were designated as "most critical", "next most critical", and "least critical" need for child care centers. Map 3 is a summary of the six variables with the critical degrees shown by tone. Following this summary map are individual Maps 1, 4, 5, 6, 7, 8, and 9 which show each of the primary variables used for identification of the critical need neighborhoods.

Based on the analysis of population estimates, the location and services capability of existing child care centers, and the analysis of social and economic considerations, the primary "target areas" for immediate development of more adequate child care facilities are neighborhoods 1B, 4, 5A, 12, and 13. These areas have in common large populations of children under six, large numbers of economically deprived people, high rates of juvenile crime offenders, and large numbers of families receiving public financial assistance. Perhaps most significantly, four of these neighborhoods have the greatest density of experienced unemployed persons. Substandard housing is most extensive in neighborhoods 1B, 12 and 13, which gives additional weight to the evidence for improved child care capability in these areas. Child care capability at the present time in the "critical" neighborhoods is severely lacking. While there are an estimated 5,000 children below the age of six in these five neighborhoods, three-fourths of the children are not being served by any kind of preschool program. Neighborhoods 4 and 5A are most lacking in such facilities.

The programs in existence probably do not provide total child and family development effort so desperately needed for depressed areas. In such areas, where poor health, poor education, lack of occupational preparation, and lack of a sound base for personal value-building are the consequences of deprivation, "custodial" child care programs for the young are not sufficient to meet the need.

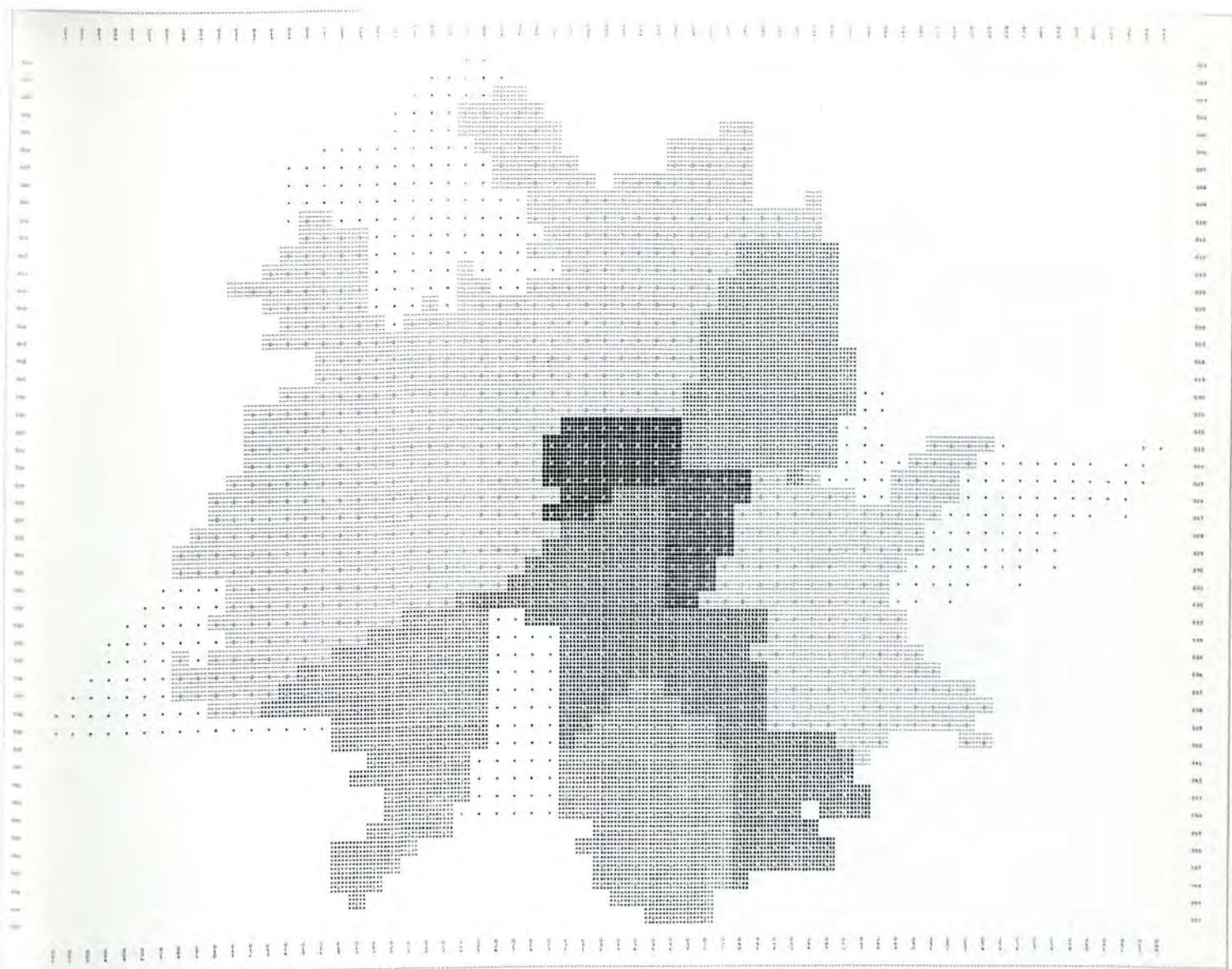
Areas of intermediate need — "next most critical" — are neighborhoods 5B, 6B, 7, 2, 1A, 8, and 3B. These areas are lacking in presently available child care facilities. They have, however, an advantage in terms of the social and economic factors studied. "Least critical" areas in Winston-Salem were identified as neighborhoods 10A, 3A, 6A, 11B, and 11A. Developmental activities for child care in the "next most critical" and "least critical" areas should assume second and third priority status at the present time.

Areas of the county outside the corporate limits of Winston-Salem were not subject-

ed to the same research analysis as those within because of the lack of recent demographic data. Certain areas of the county, particularly those of high population density in the northwest and southern sections, could become priority areas on the basis of additional information following the 1970 census.

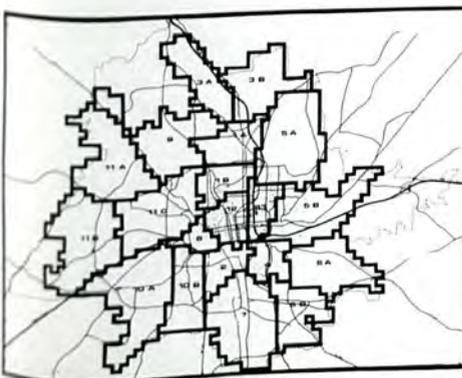
The fact that five "critical need" neighborhoods are identified for immediate action should not indicate a lack of need for expanded child care capability in all areas of Forsyth County. Local planning and development should begin immediately so that by 1980 seventy-five percent of the children under six can be served by some type of child care development program.

The trend for mothers of young children to seek gainful employment undoubtedly will rapidly gain momentum. Present research, which indicates the critical importance of good physical and emotional health and intellectual stimulation during the early years, will be continually reaffirmed and strengthened. The concept that early parent-child intervention programs can be a prime means of breaking the "cycle of poverty" and its drastic toll in human productiveness is gaining acceptance. Those factors indicate the urgent need for large scale planning and development through cooperative efforts of public and private interests whose futures are dependent upon productive, available manpower.



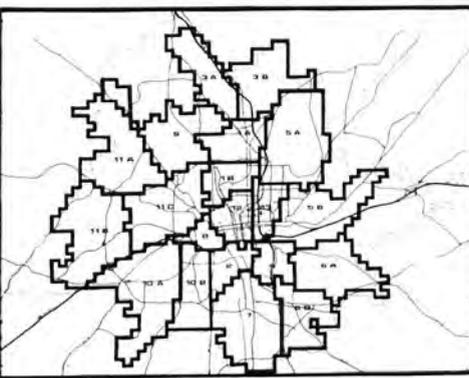
**POPULATION DENSITY
WINSTON-SALEM, NORTH CAROLINA**

SCALE
 DARK LIGHT
 GREATEST DENSITY LEAST DENSITY



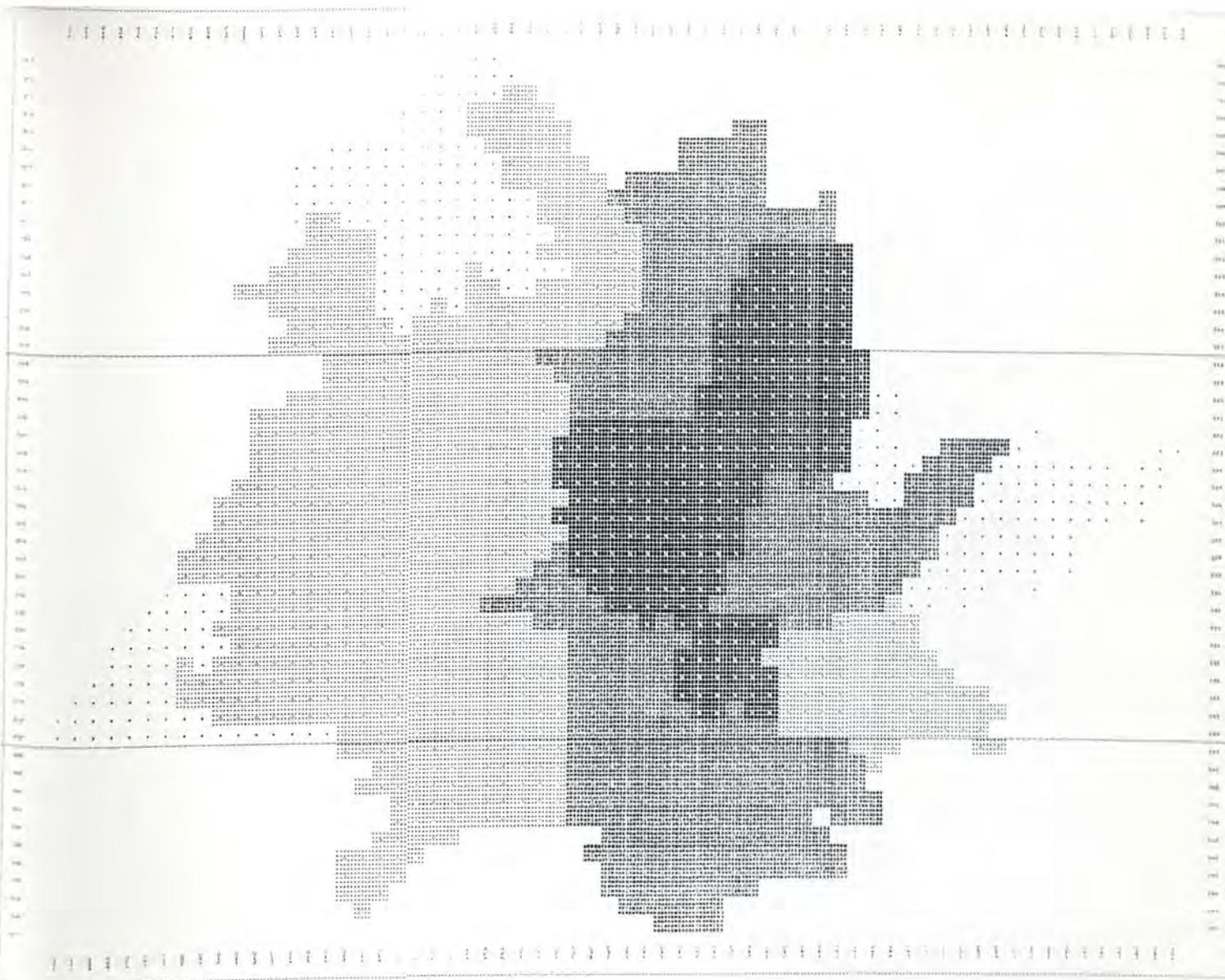


SCALE 1:50,000
 SOURCE: BUREAU OF THE CENSUS, 1960



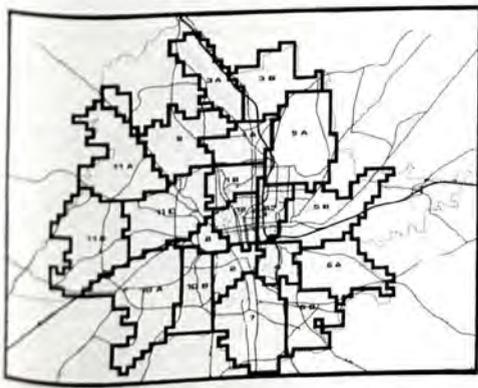
**LOCATION OF PRESENT
 CHILD CARE CENTERS
 WINSTON-SALEM, NORTH CAROLINA**

CENTERS MARKED BY ASTERISK



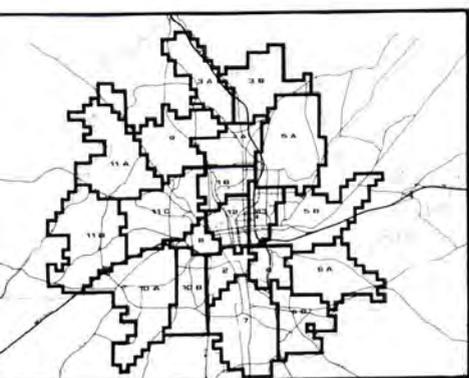
**IDENTIFICATION OF CRITICAL
AREAS FOR CHILD CARE IN
WINSTON-SALEM, NORTH CAROLINA**

SCALE
 DARK LIGHT
 MOST CRITICAL LEAST CRITICAL



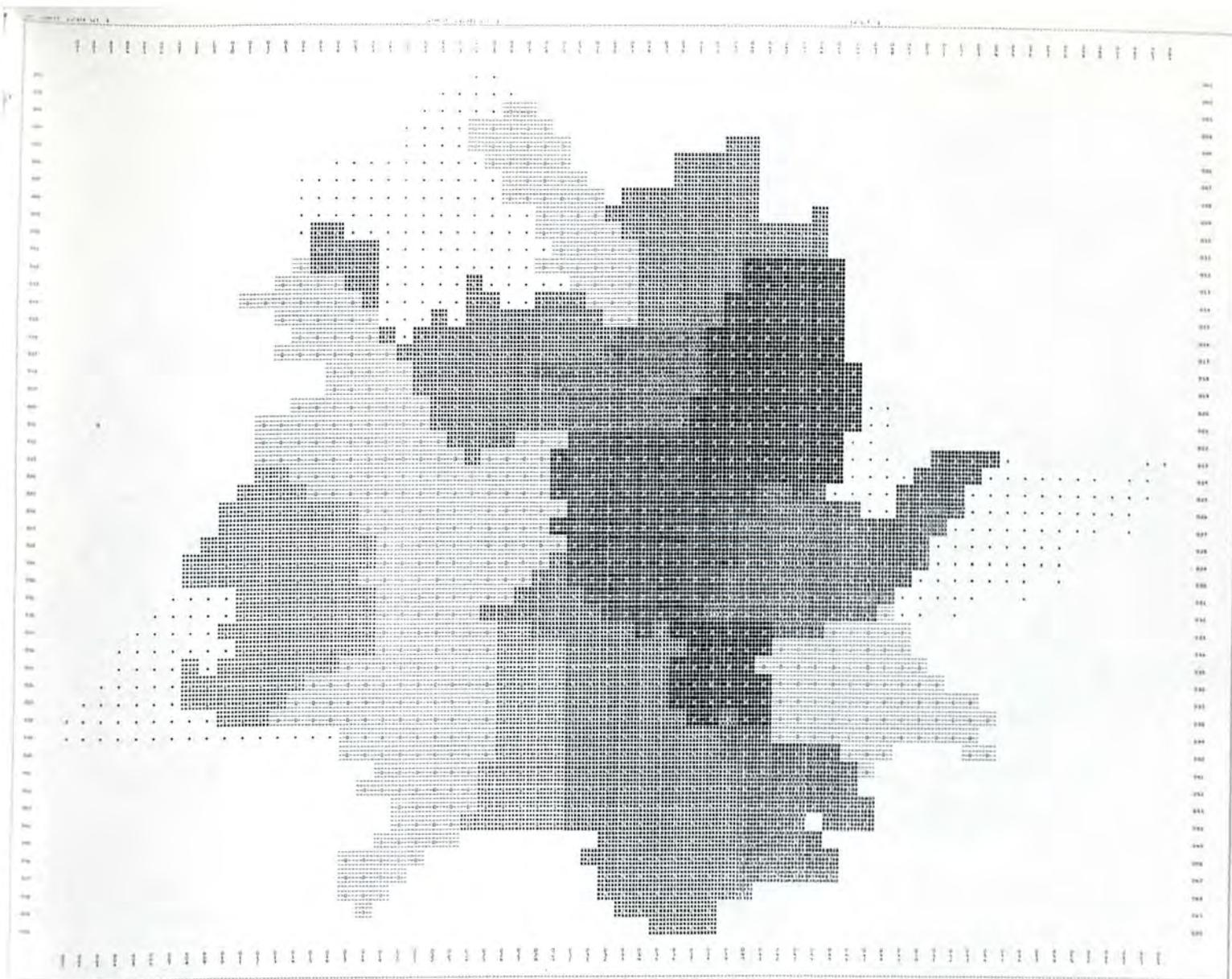


PLANNING
DESIGN INCORPORATED BY TERRY STARK, A

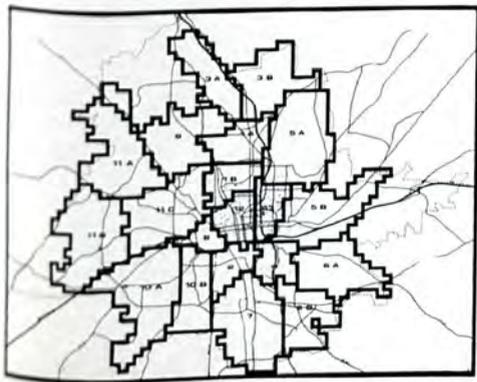


**LOCATION OF JUVENILE
CRIME OFFENDERS
WINSTON-SALEM, NORTH CAROLINA**

SCALE
 DARK LIGHT
 MOST OFFENDERS LEAST OFFENDERS



AFDC 1971
 FIGURE PREPARED BY 1971, 1971



**LOCATION OF AID TO FAMILIES
 WITH DEPENDENT CHILDREN (AFDC)
 WINSTON-SALEM, NORTH CAROLINA**

SCALE
 DARK LIGHT
 MOST AID LEAST AID



Parent-Child Center, Winston-Salem

Dixon Hanna, John Hitch, Theresa Raper

The newly developing concept of an early parent-child intervention program is based on the need for a better understanding of the development of a child's intellect and the effect of poverty on adult family role relationships.¹ While stimulating the child's early intellectual and social development is primary, provision must be made for improving his total environment — the effects of inadequate education, of poor economic base, and of maladaptive parental response.² A parent-child center is an attempt to change this environment by stabilizing and strengthening the family unit through training, stimulated socialization, and new learning experiences with a program incorporating early intervention for the child and an opportunity for training, social contact, and marketable employment skills for the parent(s). The basic objective of the program for such a center may be stated as follows:

1. "To stimulate the intellectual and social development of the children through early social and environmental intervention and experiences which are cognitively stimulating.
2. "To strengthen the familial role relationship.
3. "To reinforce the skills and the self-image of the mother and father.
4. "To seek to bring about sounder economic achievement through education; and
5. "To generate data through research and evaluation which will be useful for future programming of early childhood service centers."³

The strength of the parent-child program lies in its attempt to intervene, over a realistic period, and positively affect the entire family. The reinforcement of familial roles will yield significant behavioral changes (and more normal intellectual development) in the offspring by providing adult attention and intellectual stimulation during the period of growth.⁴

The division of activities outlined to achieve the objectives of the parent-child program are the nursery training program, the assisting mothers program, and the fa-

thers program.⁵ The child along with his mother is involved in a group experience — the nursery program — in a new environment designed to foster growth and intellectual development. The assisting mothers program is intended to develop her roles as wife, mother, and homemaker so that she may feel a positive attitude in her personal and parental (and professional) life. The fathers program is designed to develop and strengthen his role as bread-winner, head of the household, husband, and father.

The parent-child program admits the child (and family) at his first birthday. Thus, new admissions are distributed through the year causing minimum disruption and age distribution within the center and allowing steady, slow rate of selection and recruitment.⁶ As the child enters his program, parents enter into adult training or control conditions. The child at about 3 years of age will transfer to a center in or near his neighborhood for the remainder of his development program. The mother then chooses (1) to accept employment, if qualified, as a child education aide in public school or elsewhere, (2) to transfer as an aide to the child's new center, (3) to enter other training of her choosing, or (4) to return to full-time home-making.⁷ By directing the family to its neighborhood center, it would be hoped that the parents' training and counseling could be comfortably transferred.

The family's move to the neighborhood center should have a viable effect on its neighborhood. The family could remain involved in the neighborhood center where the results of the first two years of training can be put to use most realistically and serving as an example and incentive to other families. When the (experimental) child is five years old, he would go to a kindergarten. By this time his mother should have attained a relatively permanent vocation.⁸ Parents are encouraged at this time to meet with local school officials in order to make proper preparations for their child.

Nursery Training Program

The primary theme of the parent-child program is to realize the potential of children from low income families through pre-school training. The program is based on the hypothesis that "mental maturation is a consequence of a suitable array of experiences."⁹ Through direction in a stimulating environment, the child may gain in

social, emotional, and cognitive (visual, auditory, and verbal) development during his very important early years. The simultaneous parents' program encourages the development of the home environment and familial relationships.

The goals of the early intervention program are described in terms of the child's behavioral patterns and characteristics:

1. The development and fulfillment of the individual

"The child is encouraged to become self reliant, to learn a sense of achievement, motivation, and to develop a positive self concept. The child's goals become the ability to learn to channel energy constructively, to develop skills, to be self reliant, to respect his peers and the physical surroundings, and to express his own desires and individual needs."¹⁰ Thus, he will become able to effectively handle regulation of his world at each developmental level.¹¹

2. Social development and concept of social group

The child is encouraged to participate in group settings. His environment is seen as a small model society and he is learning to participate in the culture. Cooperation and the feelings of others are emphasized in this socialization effort.^{12,13}

3. Intellectual development

A stimulating environment must have as its impetus the qualities of the involved individuals. Guidance by positive reinforcement and direction to new experiences cannot be overstated as means of promoting development in a young child. Equipment conducive to stimulation of creative growth, manipulation, and maturation will be used in helping the child learn to deal with his world and surroundings.¹⁴ Expression of an appropriate orientation in reality and constructive use of fantasy is developed.¹⁵

The environment of the child's program must have certain attributes and offer a variety of possibilities conducive to self exertion and learning experiences. The development of a young child is fostered by

1. "... the deliberate provision of a learning environment that is both stimulating and conceptualized as encompassing the interpersonal, the experimental world. There should be a great deal of clear and deliberate stimulation for learning; but at the same time many opportunities are provided for the child to select experiences which he in some way needs or favors at a given moment.
2. "... an optimal level of need gratification. Teacher vigilance is the most critical element in identification at this level. (Each child must have the opportunity for a one to one relationship with the teacher.)

3. "... a positive emotional climate in which the child learns to trust others and himself. (He should even be able to retreat for a period of solitude.)
4. "... an environment containing a minimum of unnecessary restrictions on his early exploratory attempts but a supply of natural restrictions that provide valuable feedback data is helpful in retaining movements and actions.
5. "... the provisions of rich and varied but interpretable cultural experiences . . .
6. "... a physical environment that separates figure from ground and contains modulated amounts and varieties of sensory input, color, shape, texture, sound patterns, etc . . .
7. "... access to certain kinds of play materials.
8. "... the introduction of new experiences that provide an appropriate match for the child's current level of cognitive organization."¹⁶

There is frequent verbal communication and maximum stimulation from adult contact. The relationship and involvement with the child's own mother and classmates' mothers, along with the teacher, maintains a minimum 1 : 2 ratio in the nursery. Other personnel who come in direct contact with the children include two verbalizers (college-trained adults serving as language models in the nursery and having one-to-one contact with the children), the cook-instructor, the physical plant men, the testers, and the nurse.¹⁷

The program guidelines are designed not only with respect to the child's development in the nursery, but also to create an awareness within the assisting mothers:

1. "Objectives must be stated as a series of specific tasks.
2. "Teaching presentation to child and mothers must conclude from objective tasks.
3. "Concept analysis needed for successful performance.
4. "Clear definition of concept is needed.
5. "Training in perceptual discrimination has to be developed.
6. "A feedback of information must be designed as to the performance of the child attained.
7. "Planning of the program will take in consideration the National Planning Opportunities.
8. "Sensory motor stimulation needs to be developed.
9. "For the successful performance of tasks, the appropriate language skills must be developed to the extent to which information is successfully transmitted from teachers to pupils and among the pupils of different backgrounds...

Assisting Mothers Program

The mothers program is designed to offer learning experiences through example, observation, and practice, which will strengthen the mother in her familial role. The major functions served are (1) assessment of the mother's current knowledge and practice in home economics related areas, and (2) development of a scheme of activities which are obviously relevant to the mother in her daily role and provide a natural opportunity for direction and supervision.¹⁹

Areas of training are designed to strengthen the mother's role in daily public and private life as a homemaker or employee, as well as enriching her appreciation in executing the tasks involved.

1. The role of the mother

"It is the verbal environment and, more specifically, the mother's language behavior that mediates the educability of the child. If the mother fails to inject sufficient cognitive meaning into a task, she may structure a situation in which the child not only fails to learn, but also develops a negative response to the learning experience."²⁰ Hence, the mother's interaction with program personnel is designed to provide model learning and skill-developing situations especially in the development of verbal communication and a wholesome, fulfilling relationship with her child. The mother will observe teachers and trainers and gradually take on increased responsibility working with her child thus building self confidence as well as her capabilities day by day.²¹ Her increasing awareness and skills with the children become a part of her home life and the lives of her family.

2. The role of the homemaker

In addition to involvement with her child, the mother's program concentrates on homemaking skills. A practical approach is taken toward the organization of her household and family considerations.

3. The role of the wife

The constant accumulating of skills which build the mother's self esteem and confidence also has an effect on her role as a wife. Her competence and satisfaction in execution of daily tasks are increased. There is an opportunity for discussion groups and counseling, similar to the father's program, which exposes the mothers to general family problems and how to cope with them.²²

4. Employment

The mothers are employed at the center five mornings per week at the federal minimum wage.²³ This is mostly an incentive pay; it is foreseen that the mother as well as the father will probably work in order to support the family's aspirations. Compensatory education and occupational training are available in conjunction with the mother's program. Having gained experience in pre-school training, some mothers may seek advanced training and go on to regular employment as aides.

The mothers program each day consists of time with the (mother's) supervising teacher and with the children under guidance of the nursery teacher, experience in preparing the noon meal under guidance of the cook-instructor,²⁴ and basic training and education courses. Each mother is assigned (through rotation) to various duties in the morning schedule and is also expected to remain in the centers some afternoons each week (without pay). One mother (in rotation) is assigned to the kitchen each day. The remaining mothers are divided into two groups; one is engaged in the nursery program and the other in the mothers training program.²⁵

The mother's training program features special practical activity elements besides those in conjunction with the nursery:

1. Sewing

Sewing instructions and pattern use, necessary equipment and maintenance, personal fashion analysis and color coordination, fabric selection, design and pattern making, fitting and alterations (which may be developed as an at-home occupation), home decorating (curtains, etc.).

2. Home management, family economics and consumer buying

Budgeting, price comparison, credit buying, loan arrangements (sources of assistance and interest rates, etc.).

3. Personal and family relations / Child development and guidance

Special discussion groups and private counseling and assistance for social and medical services, observation and evaluation of "target-child" at home and at the center.

4. Housing, home furnishings, and equipment

Types and costs of housing (rental, utility bills, landlords), locating housing or moving, decorating (flower arranging, centerpiece design, furniture and room arrangements), maintenance and repairs, home services extension.

5. Food and Nutrition

Cooking in the center, meal planning and preparation, balanced diet and proportionate servings, food selection and purchasing (field trips), canning and making preserves.

6. Special interests

Art, music, crafts, writing (publishing a newsletter), reading (special courses will be provided if desired).

7. Field trips

Course-related (*i.e.*, to a grocery store or to buy fabric or price furniture), or exhibits and activity locations.

Fathers Program

Through social and economic frustration, the low income father may have acquired tendencies to be unreliable and unconcerned toward his life, job, and family. Unable to support his family financially and emotionally, his esteem drops; overwhelmed by an intolerable domestic climate, he ultimately leaves his family. By default the family becomes a matriarchal unit.^{26,27} The parent-child program attempts to change this cycle of instability and poverty. The father's program is designed to strengthen the role of the father as provider, husband, father, and head of the household.

The elements of this program include (1) cooperative counseling,(2) human relations training, (3) educational and vocational training,²⁸ and (4) participation with his child.

1. Cooperative counseling

A joint effort between the participant father, the family service worker, and the father's program consultant must be made in order to assess and direct each father toward occupational and educational goals.²⁹ This is done in order to provide a path orientation for the father as well as a meaningful relationship with the program staff. Cooperative counseling also refers to "crisis counseling"; the father may come to discuss problems of health, finances, job loss, and placement, marital relations, etc.³⁰

2. Human relations training

The basic goal of this element of the program is for a man to develop the ability to communicate with his fellows,³¹ initially in a relaxed and informal atmosphere. As a group matures more concrete problems may be introduced for discussion. Also, the goals of this program may become more refined—increased self awareness, sensitivity to the behavior of others, increased understanding of group processes, increased action skill, and learning how to learn.^{32,33}

3. Educational and occupational training

Educational and occupational training, recommendations, and placement is part of the effort to assist fathers (and mothers) in improving their salable personal qualifications. Various community agencies and programs will offer vocational and technical courses, college preparatory courses, pre-technical, pre-vocational, adult high-school and enrichment courses.³⁴ Self improvement and realistic upward mobility are the goals of this training effort.

4. Participation with his child

The father is asked to cooperate with the pre-school training of his child in science study. (The science curriculum is considered appropriate to the masculine role and admirable in the context of contemporary society.) A science training consultant works over assigned project material with the father and child and helps the father to evaluate the effect on the child's mental development.³⁵ The process of learning should be interesting and valuable to the father as well as the child. In addition the father becomes participant in the development of his child and receives personal response for his efforts.

Particular activity elements of the father's program are designed to help the father increase his skills, interests, and self confidence. Developing grounds for communication in a comfortable and encouraging situation is essential. The Center is not a refuge; it is a resource for opportunity, information, and stimulated socialization.

Some participating fathers may become staff members as family aides, physical plant men, etc. Fathers are encouraged to participate in workshops for making toys and equipment for the Center or the home. They may learn effective care of the home and home improvements (including carpentry, appliance repairs, etc.). Car repair is another possible communication medium. Counselors are constantly aware of emerging skills and fortes and encourage hobbies and occupational skills. Model building and sports (basketball, baseball, bowling) provide an opportunity for interaction and even instruction, especially with older children. Through these "non-occupational" activities, fathers become leaders as well as participants, taking on increasing responsibility for generation of their own programs (as in the mothers program).

Family Services Program

The goal of the Family Services Program is to strengthen family life by strengthening the individual family members in their respective roles. This program element, the service staff, works with the entire family in a variety of activities "to improve the level of family functioning and capitalize upon every opportunity for positive change."³⁶ (The basic assumption of the Family Services Section of the Parent-Child Center Program "is that the family unit itself is the chief agent responsible for the shaping and developing of those values and norms which contribute to the goals and achievements of individual family members and of the family as a whole."^{37,38})

Activity Patterns: Nursery Training Program

The activities within the nursery area are varied; each child is free to move, explore, and manipulate this environment at his own pace. The schedule is flexible to the needs of each child and his interaction patterns. Although the day is divided into activity periods, individual involvement is not rigid. Group activities are planned but on a free-choice basis. The characteristics of the major activity patterns which will influence the physical form are:

Arrival and Entering. The major entrance to the nursery should be clearly visible and distinguishable from entrances to other facilities. It should have a character which invites the child to identify it as "mine." The entrance area (with generous circulation space and ample storage) will be a place of reception, orient-

ation, and direction for arriving children, mothers, and visitors. A warm welcome from the teacher and/or staff should usher each child, along with his mother, into the center and into the day's routine. (The process of entering into this ordered and open environment is an important aspect in the sensory development of a child whose home environment may be somewhat crowded and chaotic.) Incoming children will go to their classroom for storing personal possessions (coats, sweaters, boots, smocks, blanket, and small private items) in a place identifiable as their own.

Health Checks and Medical Facilities. Morning health checks by the teacher or staff nurse screen entering children to assess those who require rest and examination. Treatment and periodic visits by a pediatrician determine more permanent isolation for sick children.

Transitional Play. The early arrivers will go outdoors from their classrooms or engage in "transitional play" activities indoors. These activities will be planned for comparatively short duration and individual occupation. When everyone has arrived, the mothers assist the children with breakfast in the classrooms.

Eating. Eating is a learning experience. Infants are fed in high chairs by assisting mothers; they eat together, with one mother feeding each child. Older children eat in small groups at tables; they set the tables, serve food, and clean up. (Meals and snacks are brought to the classroom in prepared trays from the central kitchen.) The assisting mothers clean up after meals, wash bibs, etc. After the children finish their meal, they are channeled into various indoor play activities by the teacher and/or assisting mothers.

Food Preparation and Service. Meals are planned and prepared by a dietician and the assisting mothers in a central, commercial-type kitchen. Food storage and delivery are integrally related to food preparation.

Indoor Play Activities. Children disperse to a choice of various planned activities (often relating to a common subject or theme). Each type of activity has a center—an interest area—where selected, relevant objects and materials are accessibly displayed to arouse the child's interest and curiosity. Adults are available to guide and instruct individuals or small groups.

Constructive use of all classroom media is critical to develop social, conceptual, and cognitive skills and to enhance the child's self image. Variation in scale and texture

can channel enthusiasm along appropriate paths. Sensory development must be continually encouraged, aroused, and stimulated with various materials, sizes, shapes, and light conditions. There must be spaces for noise and quiet, for play and contemplation, for groups of differing sizes, and for privacy.

The range of activities and available interest areas offered on any day, at any time is variable. It includes:

1. Physical media (block building, climbing, wheel toys)
2. Creative unstructured media (painting, clay modeling, water, sand)
3. Structured, symbolic media (games, puzzles, letters, numerals)
4. Imaginary play (household, dress-up, dramatic play)
5. Music (songs, rhythm instruments, records, tapes, dancing)
6. Browsing (books, pictures, audio-visual aids, animals, plants)

Outdoor Play Activities Activities designed for developing self awareness of the child's surroundings will extend to the outdoor spaces; they are an exterior extension of the classroom (learning) experience. Included in these outdoor activities are:

1. Large muscle coordination and development (slides, swings, monkey bars, tricycles)
2. Small muscle coordination and development (digging, pushing and pulling toys)
3. Hand-eye coordination (throwing, building, climbing)
4. Spatial relations (running)
5. Imaginative play (toys, games, etc.)

The outdoor area requires protection from vehicular traffic and older children and provision for observation from indoors. There should be a variety of textures and surface finishes outside—hard and soft, sand and grass, flat and mounded, sun and shade. A covered terrace provides an extension of the classroom; a hard surface permits control of movable equipment from indoors to outdoors. Outdoor storage is easily accessible.

Quiet Time. After an active play period, the children clean up and rest before lunch is served. This is a time for "winding down." Each child takes a mat to a place where he may lie quietly; he may take a toy or book with him. The room should be darkened and all organized play activity ceased. Meanwhile the assisting mothers make preparations for serving lunch.

Departure. Departure involves preparing the child for the transition back to his home environment. The child is wrapped by his mother or another assisting mother. His personal articles are assembled in his personal storage location and his creative work of the day is bundled for his easy carrying. The same careful direction which welcomed the child's arrival at the Center accompanies his departure when he is called for.

Assisting Mothers in the Nursery. The assisting mothers virtually become teacher's aides-in-training in the nursery. The youngest children require special attention and aid in learning self-feeding, getting ready for outdoor play, cleaning up after play, etc. Toddlers take on more structured play activities requiring adult guidance. Maximum personal contact and instructional situations are implemented so that the mothers may better realize "why" things are done and develop a sensitivity for the proper time and best method of intervention. The mothers gain in the ability to provide stimulating experiences indicated by the developmental progress of the children; they learn to keep records for individual children in terms of a child's functioning in language, perception, concept-formation, etc. as well as physical, social, and emotional development.³⁹ Non-participant observation and evaluation (from an unrestricted vantage point) allows the mothers to study the nursery environment and activities without disturbing the children's privacy.

Activity Patterns: Assisting Mothers and Fathers Program

The adult participant program activities are formulated to give maximum flexibility in accordance with the needs and interests of the individuals. Activity elements include regularly scheduled classes for practical training, as well as a variety of informal situations designed to encourage communication and generate discussion among the participants and staff. The adult programs become a changeable pattern of loosely structured activities interspersed with instructional sessions.

The assisting mothers program emphasizes development of domestic skills, practical interest, and hobbies, in addition to efforts relating to the nursery training program. The fathers program offers relaxed situations after work hours for individual skill development and group socialization in a "men-only" setting and for personal counseling. Parents and families join in large group activities, *e.g.*, discussions, picnics, ball games

Group Study and Exploration. Regularly during the course of a day, a formal collection of participants is arranged for discussion of a topic such as home management, personal and family relations, or health and hygiene. Such sessions involve instruction by the staff or a visiting speaker followed by discussion among members of the group. These sessions also provide a focus for various training activities and informal conversations.

"Human relations training" is a special component of the group exploration activity. The fathers are brought together with the objectives of self-awareness, communication, and socialization. Beginning as a loosely structured discussion session, these meetings cause the group to coalesce into the functional representative governmental unit of the program.

Sewing. Sewing classes meet periodically during the week to study aspects of dress-making, material and pattern selection, and home decorating. Group discussion, directed by a staff member, usually precedes a work period. Sewing tables, a large cutting table, ironing boards, etc., and generous storage for materials, equipment, and individual projects are provided. An individual may also use the equipment independently.

Cooking and Nutrition. The mothers assist the dietician in the preparation and serving of all snacks and meals. One mother, in rotation, devotes her entire day to working with the dietician—meal planning, food preparation, etc. Special class sessions focus on nutrition, family meal planning, food selection, etc.; the central kitchen becomes a laboratory for introduction to and experimentation with new recipes. Buying trips stress the importance of shopping for the best quality and quantity values. An extension program stimulates continuation of training projects at home.

Taking a Break. Taking a break from planned activities permits staff and participants to relax and socialize, recoup their energy, or gather their thoughts. Comfortable chairs and coffee in an area removed from structured activity provide for a staggered flow of those seeking an informal moment.

Hobbies, Arts and Crafts. Instruction and materials for various arts and crafts (painting, needlework, sculpture, etc.) are provided to stimulate the development of creative expression and achievement by the participants. Since such activities

are undertaken after training program hours and sometimes independently, work sessions are sporadic and often of short duration; therefore, generous and easily accessible storage for materials, equipment, and individual projects is provided.

Construction and Repair Work. The development of utilitarian skills is emphasized, particularly in the fathers program, as a practical hobby (with masculine role identity) as well as a possible training orientation. With staff direction, fathers engage in furniture building and refinishing, building alterations, appliance and automotive repair projects. These projects are participant-motivated, providing maximum personal involvement and interest, still relying heavily on staff reinforcement for added stimulus and pride in accomplishment. Materials and equipment are kept safely away from children and arranged for comfortable access to the work area at any time.

Guidance and Counseling. A formal, administrative effort is made in orienting participants toward progressive vocational educational goals. A confidence is established between staff and participant to encourage the participant to feel that he will always receive assistance in any perplexing or crisis situation (financial or marital problems, job loss, etc.)

Sports and Recreation. A variety of participant and spectator sports is organized both for team and group socialization and as an energy outlet. Fathers become teachers; siblings become a significant force in the visible activity of the group. Since competition promotes self identity and performance development, other constructive hobbies (kite and model building, etc.) are also encouraged for father-son teams.

Picnics and other group get-togethers are planned for staff and participants.

Activity Patterns: Administrative Services

A technical advisory committee, a representative board, and the director comprise the primary administrative units of the parent-child center. The technical advisory committee (including the director, selected members from the fields of social services, child development, education, etc.) advises the director on administering fiscal, public relations, and policy programs. The representative board, made up of members of the participant families, selected advisors, and the director, functions

as a grievance committee, lobbying delegation, and political nucleus for the participants' interests in the administration of their program. Cooperative endeavors, such as bulk buying, equipment purchasing, are enacted through this assembly. The director has authority in all policy and program planning, coordination, and administration, including family services, research, documentation, home extension, and processing of staff and participant applications. The number of staff personnel varies with the number of participants, the scope of the programs housed in the center itself, the extent of involvement of service agencies, and the money available for personnel. Typically, the full time "in-house" staff may include:

- director (1)
- receptionist/secretary (1)
- dietician / nutritionist (1)
- plant man (1 with at least 1 assistant)
- nurses (1 or 2 registered nurses or 1 RN with 1 or 2 aides)
- family service workers (1 per 20-25 families)
- teachers (3-5) for assisting mothers program,
2-5 for nursery training program)
- 1 teacher per 5 children below 1 year of age
- 1 teacher per 10 children below 2 years of age
- 1 teacher per 15 children below 3 years of age
- 1 teacher per 3-4 assisting adults

Planning and Evaluation. The "front line" staff (teachers, aides, nurses) meets daily to review, develop and improve program content and curriculum and to discuss participant performance. Constant evaluation and change occur in response to observed development and expressed wishes of the participants. The director conducts weekly, full-staff meetings to coordinate the variety of programs underway simultaneously and share in assessment of the overall effectiveness of the project. The staff has responsibility for continuity from the center to the home environment, participant progress, and planning of special projects. Planning and coordination of the use of the facilities, the extension program, and its relation to the neighborhood and community are the duties of the director in conjunction with the technical advisory board.

Observation and Visitors. Observation in the parent-child center is either semi-isolated, non-participant or participant. (Isolated, non-participant observation results in subject sensitivity, especially in adults of ethnic minorities. ⁴⁰) Observation requires full audio and visual access to the subject; in a semi-isolated situation provision is made for audio amplification and easy viewing. Semi-isolation, in this case, implies that an adult be able to recognize the observer's presence, (not feeling "lurked", he proceeds with his activity) while a child is unaware of the observer. This is especially important if there are large numbers of visitors who may, by their intrusion into the nursery area, disrupt the children's activities. Participant observation is desirable for some types of research, in-service training, and staff evaluation; one or two people may enter a work or play space and remain comfortably without interrupting the participants. The adult participants take the responsibility of conducting and assisting visitors; nevertheless, the number of visitors is controlled by the receptionist.

Research and Testing. The quantity and subject of research and testing of participants in the parent-child program is tightly controlled and coordinated by the director. Effective testing, coupled with observation, is a significant tool in the evaluation of program participants. Each participant is matched with a control subject; both are tested by special, impartial personnel for certain developmental qualities under identical situations. (Thus, comparative testing must occur outside the participant's usual environment.) Some research projects will be initiated from institutions other than the center itself. Efficient design of these and all other projects must emphasize minimum staff and participant inconvenience and program disruption. Projects may be synthesized with curriculum design or carried out through participant or non-participant observation.

Home Extension The purpose of the extension program is to encourage continuation of center-initiated activities and studies in the home, *i.e.*, home improvements, food purchasing and nutrition, consumer buying, etc. The family services worker visits each family at least once a week to aid all family members to adjust to individual change and mutual development, especially other children of the family. Through the family services worker, the participant family has a liaison with community agencies for housing, welfare aid, employment, and assistance in crisis situations (financial, unemployment, physical illness, etc.). The transmission of the influence of the center to the home provides positive reinforcement to the entire

family; the feedback from home extension is vital in evaluation and modification of the program.

Activity Analysis

The range of molecular activities occurring in the Nursery Training Program, Assisting Mothers and Fathers Programs, and Administrative Services has been identified as a technique for defining the basic program. These molecular activities are grouped into activity areas (and given symbolic representation) with respect to the similarity and/or compatibility of their behavioral characteristics. Selected environmental attributes (in pairs of bipolar opposites) used to qualify physical responses to the particular activity area are operationally defined as follows: ^{41,42}

Communality/Privacy describes the degree to which the user must share a setting with others. Thus, privacy is the absence of unwanted human stimulus and surveillance within a setting; it may be achieved by (1) a sense of enclosure or insulation from other people or (2) a sense of distance from other people (including such signals as sight, sound and smell).

Sociopetality/Sociofugality indicates whether a setting encourages or discourages social interaction. Sociopetality, then, is achieved by the presence of elements in a setting which suggest and support the interaction of people. A setting is highly sociopetal if (1) there are fewer formal activities than people, (2) many of the activity elements comprising the setting are conducive to lingering, (3) if the "normal" distance between people is between two feet and nine feet and they are facing each other with no barriers to interaction between them, and (4) if a setting is (or is open to) the intersection of paths that connect many activity areas or ones highly and often utilized.

Formality/Informality is a characteristic of a setting that conveys whether or not the use of that setting is prescribed by behavioral rules. Thus, formality is where activities or behaviors are highly predetermined by the setting; it may be achieved by (1) a specific, or relatively fixed furniture arrangement, (2) precisely fitting shape and space allocation to the activity, participants, and furniture, (3) designing the sensory environment to be responsive exclusively to the particular activity.

Ambiguity/Legibility is the characteristic of a setting that makes clear or vague the intended use(s) for which the setting has been provided. Legibility is achieved through (1) a high degree of spatial cues clarifying the use, (2) direction of movement, and (3) location of the setting in relationship to other settings, geophysical elements, or climate.

Diversity/Homogeneity describes a setting according to the number of activities which may coexist within the particular setting. Diversity is a characteristic of a setting which suggests and supports number of similar or mutually compatible activities.

Adaptability/Fixity describes the capacity of a setting to be adapted to change. Adaptability is a measure of the resources (man hours and skill level) which must be expended to adapt a setting to support new activities.

Stimulation/Relaxation indicates that a setting promotes or discourages the individual user to participate in the activities provided. Stimulation, then, is achieved through the presence of visual elements and a responsive sensory environment which suggest and support individual participation.

Complexity/Simplicity is a visual characteristic of a setting which conveys the level of intricacy of the visible components of the setting. Complexity is the presence and/or degree of intricate formation of visual elements within a setting.

Certain environmental characteristics are applicable to all activity areas. These include:

Familiarity indicates to the user that the setting is one of a class within which he has operated before. Familiarity is achieved through the presence of familiar objects in a setting familiar to the user and may describe the relationship of building to site, the historic style of building, the materials used, the shapes, the sequences of spaces, and the type and placement of furniture, equipment, and information devices, etc.

Accessibility is an indication of the relative ease with which a user approaches or enters a setting. Accessibility is achieved through minimizing expenditure of the user's energy in reaching a destination and maximizing his motivation; it is directly proportional to distance, time, and physical obstacles en route.

Comfort is the sum of those physical characteristics of environment, furniture, and equipment which affect the physical performance of an activity by a participant. Comfort is the ability of a setting to pass human engineering standards tests which define a "comfort zone" for users engaged in activities. A setting is considered comfortable if it can pass tests in the following two categories: (1) sensory—supply and control of thermal qualities, illumination, acoustic qualities, and air quality and (2) physical—equilibrium and anthropometric "fit" (shape, size, surfaces, position).

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On the following pages, activity areas will be described in terms of objectives, participants, molecular activities, and environmental attributes. Participants are defined as:

(C) children

(1) under one year of age

(2) under two years of age

(3) under three years of age

(4-6) under four to six years of age

(M) mothers

(F) fathers

(S) staff

(V) visitors

(M/S) assisting mothers and/or staff

For each activity area (setting), the bipolar pairs of environmental attributes are rated on a scale of five increments:

extremely slightly neutral slightly extremely
warm _____ : _____ : _____ : _____ : _____ cool

If a setting is described ideally as closely related to either attribute, the scale is marked in the corresponding "extremely" increment. If the setting is equally related to both attributes, or if the setting is unrelated to the scale, the mark is placed in the center space.



Reception Area



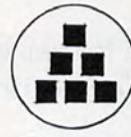
Health Area



Wrapping Area



Eating Area



Block Area



Sleeping Area



Art Area



Water Play Area



Manipulative Toy Area



Concept Formation Area



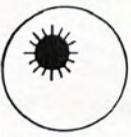
Dramatic Play Area



Listening Area



Science Area



Open Area



Swinging Area



Climbing Area



Sand Area



Group Learning Area



Individual Learning Area



Reading Area



Sewing Area



Cooking and Nutrition Area



Group Social Area



Arts and Crafts Area



Physical Fitness Activity Area



Repair and Construction Area



Consultation Area



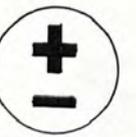
Conference Area



Clerical Area



Observation Area



Research Area



Individual Work Area



Lounge Area



Objectives:
welcoming
orientation
environmental transition

RECEPTION AREA

Participants:					Molecular Activities:
C	M	F	S	V	
x	x	x	x	x	entering
				x	greeting
				x	unwrapping/wrapping
				x	waiting
x	x	x	x	x	watching
				x	mingling
	x	x	x		directing
	x	x	x		escorting
x	x	x		x	identifying locations
x	x	x	x	x	going to other areas
x	x		x		health screening
x	x	x	x	x	talking

Environmental Attributes:

communality	X	:	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	:	sociofugality
formality		X	:	:	:	:	:	informality
ambiguity		:	:	:	:	:	X	legibility
diversity	X	:	:	:	:	:	:	homogeneity
adaptability		:	:	:	:	:	X	fixity
stimulation		X	:	:	:	:	:	relaxation
complexity		X	:	:	:	:	:	simplicity



Objectives:
health maintenance
acquisition of information
first aid training

HEALTH AREA

Participants:					Molecular Activities:
C	M	F	S	V	
x	x		x		nursing
x			x	x	examining
x			x	x	medicating
x	x		x		administering first aid
x	x		x		lying prone
x					sleeping
	x		x		observing
x					dressing/undressing
x	x		x		toileting
	x		x	x	first aid instruction
				x	keeping records

Environmental Attributes:

communality		:	:	:	:	:	:	X	privacy
sociopetality		:	:	:	:	:	:	X	sociofugality
formality	X	:	:	:	:	:	:		informality
ambiguity		:	:	:	:	:	X		legibility
diversity		:	:	:	:	:	X		homogeneity
adaptability		:	:	:	:	:	X		fixity
stimulation		:	:	:	:	:	X		relaxation
complexity		X	:	:	:	:	:		simplicity



WRAPPING AREA

Participants:		Molecular Activities:			
M/S	1	2	3	4-6	
x	x	x	x	x	taking off/putting on wraps
x		x	x	x	carrying personal items
x			x	x	storing personal items
x			x	x	handling parcels
x	x	x	x	x	talking
		x	x	x	waiting
x				x	helping

Environmental Attributes:

communality	X	:	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	:	sociofugality
formality		:	X	:	:	:	:	informality
ambiguity		:	:	:	:	:	X	legibility
diversity		:	:	:	:	X	:	homogeneity
adaptability		:	:	:	:	:	X	fixity
stimulation	X	:	:	:	:	:	:	relaxation
complexity		:	X	:	:	:	:	simplicity



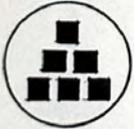
EATING AREA

Objectives:
 concept formation
 sensory and perceptual acuity
 eye-hand coordination
 socialization

Participants:		Molecular Activities:			
M/S	1	2	3	4-6	
x			x	x	setting up high chairs, tables and chairs
x			x	x	serving food
x	x	x	x	x	feeding/self-feeding
	x	x	x	x	drinking
x					preparing bottles
	x	x			throwing food
	x	x	x	x	spilling
x					washing children, bibs
x			x	x	cleaning up

Environmental Attributes:

communality	X	:	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	:	sociofugality
formality	X	:	:	:	:	:	:	informality
ambiguity		:	:	:	:	:	X	legibility
diversity		:	:	:	:	:	X	homogeneity
adaptability		:	:	:	:	:	X	fixity
stimulation	X	:	:	:	:	:	:	relaxation
complexity		:	:	:	:	X	:	simplicity



BLOCK AREA

Objectives:

- concept formation
- large/small muscle development
- self-expression

Participants:

1	2	3	4-6
x	x	x	
x	x	x	
x	x	x	
x	x	x	
x	x	x	
x	x	x	
	x	x	
		x	

Molecular Activities:

- building
- stacking
- arranging
- throwing
- taking out/putting away equipment
- hammering
- sawing
- drilling

Environmental Attributes:

communality	X	:	:	:	:	:	:	privacy
sociopetality	:	X	:	:	:	:	:	sociofugality
formality	:	X	:	:	:	:	:	informality
ambiguity	:	:	:	:	:	:	X	legibility
diversity	:	:	:	:	:	X	:	homogeneity
adaptability	:	X	:	:	:	:	:	fixity
stimulation	X	:	:	:	:	:	:	relaxation
complexity	:	:	:	:	:	:	:	simplicity



SLEEPING AREA

Participants:

M/S	1	2	3	4-6
	x	x		
	x	x	x	x
x				
			x	x
x				
x				
	x	x	x	x
x	x	x		
	x	x		

Molecular Activities:

- sleeping
- napping
- setting up cots
- getting mats
- making up cribs
- storing linens
- taking toys
- rocking

Environmental Attributes:

communality	:	:	:	:	:	:	:	X	privacy
sociopetality	:	:	:	:	:	:	:	X	sociofugality
formality	X	:	:	:	:	:	:	:	informality
ambiguity	:	:	:	:	:	:	:	X	legibility
diversity	:	:	:	:	:	:	:	X	homogeneity
adaptability	:	:	:	:	:	:	:	X	fixity
stimulation	:	:	:	:	:	:	:	X	relaxation
complexity	:	:	:	:	:	:	:	X	simplicity



ART AREA

Objectives:

- sensory and perceptual acuity
- eye-hand coordination
- small muscle development
- self expression

Participants:

1 2 3 4-6

	x	x	x
	x	x	x
		x	
		x	
	x	x	
	x	x	
x	x	x	
x	x	x	
		x	

Molecular Activities:

- finger painting
- brush/easel painting
- collage
- paper mache
- cutting
- pasting
- drawing/coloring
- clay
- cleaning up

Environmental Attributes:

communality	_____	:	_____	:	_____	:	X	:	_____	privacy
sociopetality	_____	:	_____	:	_____	:	X	:	_____	sociofugality
formality	X	:	_____	:	_____	:	_____	:	_____	informality
ambiguity	_____	:	_____	:	_____	:	_____	:	X	legibility
diversity	X	:	_____	:	_____	:	_____	:	_____	homogeneity
adaptability	_____	:	_____	:	_____	:	_____	:	X	fixity
stimulation	X	:	_____	:	_____	:	_____	:	_____	relaxation
complexity	_____	:	X	:	_____	:	_____	:	_____	simplicity



WATER PLAY AREA

Objectives:

- concept formation
- sensory and perceptual acuity
- eye-hand coordination
- small muscle development

Participants:

1 2 3 4-6

	x	x	
	x	x	
	x	x	x
x	x	x	x
x	x	x	x
	x	x	
x	x	x	
	x	x	

Molecular Activities:

- pouring
- floating/sinking
- blowing bubbles
- splashing
- washing
- measuring
- beating
- coloring

Environmental Attributes:

communality	X	:	_____	:	_____	:	_____	:	_____	privacy
sociopetality	X	:	_____	:	_____	:	_____	:	_____	sociofugality
formality	X	:	_____	:	_____	:	_____	:	_____	informality
ambiguity	_____	:	_____	:	_____	:	_____	:	X	legibility
diversity	_____	:	_____	:	_____	:	_____	:	X	homogeneity
adaptability	_____	:	_____	:	_____	:	_____	:	X	fixity
stimulation	X	:	_____	:	_____	:	_____	:	_____	relaxation
complexity	_____	:	X	:	_____	:	_____	:	_____	simplicity



Objectives:
 concept formation
 sensory and perceptual acuity
 eye-hand coordination
 visual discrimination

MANIPULATIVE TOY AREA

Participants:

	1	2	3	4-6
x	x	x	x	x
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	

Molecular Activities:

handling
 arranging
 stacking
 ordering
 combining
 taking apart
 listening

Environmental Attributes:

communality	:	:	:	X	:	privacy
sociopetality	:	:	:	X	:	sociofugality
formality	:	X	:	:	:	informality
ambiguity	:	:	:	:	:	X legibility
diversity	:	:	:	X	:	homogeneity
adaptability	:	X	:	:	:	fixity
stimulation	X	:	:	:	:	relaxation
complexity	:	:	:	:	:	X simplicity



Objectives:
 concept formation
 sensory and perceptual acuity

CONCEPT FORMATION AREA

Participants:

	1	2	3	4-6
x	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	
	x	x	x	

Molecular Activities:

sitting
 handling
 displaying
 taking apart
 feeling
 tasting
 looking
 listening

Environmental Attributes:

communality	:	:	:	X	:	privacy
sociopetality	:	:	:	X	:	sociofugality
formality	:	X	:	:	:	informality
ambiguity	:	:	:	:	:	X legibility
diversity	:	:	:	X	:	homogeneity
adaptability	:	X	:	:	:	fixity
stimulation	X	:	:	:	:	relaxation
complexity	:	X	:	:	:	simplicity



Objectives:
 positive self-image
 language development
 role enactment
 reality/fantasy orientation

DRAMATIC PLAY AREA

Participants:

1	2	3	4-6
	x	x	
			x
x	x	x	
	x	x	
	x	x	
	x	x	

Molecular Activities:

dress-up
 puppetry
 household, i.e. kitchen/laundry or baby care
 hospital
 fire station
 grocery store

Environmental Attributes:

communality	X	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	sociofugality
formality		:	:	:	:	X	informality
ambiguity		X	:	:	:	:	legibility
diversity	X	:	:	:	:	:	homogeneity
adaptability	X	:	:	:	:	:	fixity
stimulation	X	:	:	:	:	:	relaxation
complexity	X	:	:	:	:	:	simplicity



Objectives:
 concept formation
 sensory and perceptual acuity
 language development
 rhythm development

LISTENING AREA

Participants:

1	2	3	4-6
x	x	x	x
	x	x	x
		x	x
x	x	x	x
	x	x	x
	x	x	x
x	x	x	
	x	x	

Molecular Activities:

listening
 watching television
 operating equipment
 singing
 dancing
 jumping
 handling instruments
 taking out/putting away instruments

Environmental Attributes:

communality	:	X	:	:	:	:	privacy
sociopetality	:	:	X	:	:	:	sociofugality
formality	:	:	:	X	:	:	informality
ambiguity	:	X	:	:	:	:	legibility
diversity	:	X	:	:	:	:	homogeneity
adaptability	:	X	:	:	:	:	fixity
stimulation	X	:	:	:	:	:	relaxation
complexity	:	X	:	:	:	:	simplicity



Objectives:
 concept formation
 sensory and perceptual acuity

SCIENCE AREA

Participants:

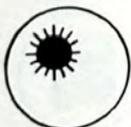
1	2	3	4-6
	x	x	
	x	x	
x	x	x	

Molecular Activities:

reading
 showing slides
 observing and manipulating displays

Environmental Attributes:

communality	:	:	:	X	:	:	privacy
sociopetality	:	:	:	:	X	:	sociofugality
formality	:	X	:	:	:	:	informality
ambiguity	:	X	:	:	:	:	legibility
diversity	:	X	:	:	:	:	homogeneity
adaptability	:	:	:	X	:	:	fixity
stimulation	X	:	:	:	:	:	relaxation
complexity	X	:	:	:	:	:	simplicity



OPEN AREA

Objectives:
 concept formation
 sensory and perceptual acuity
 large muscle development
 positive self-image

Participants:

1	2	3	4-6
		x	x
		x	x
x	x	x	x
x	x	x	x
		x	x
		x	x
x	x	x	x
			x
x	x	x	x
		x	x

Molecular Activities:

- running
- jumping
- crawling
- rolling
- tumbling
- throwing
- riding
- rope jumping
- pushing/pulling toys
- cooperating

Environmental Attributes:

communality	X	:	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	:	sociofugality
formality		:	:	:	:	:	:	X informality
ambiguity		:	X	:	:	:	:	legibility
diversity	X	:	:	:	:	:	:	homogeneity
adaptability	X	:	:	:	:	:	:	fixity
stimulation	X	:	:	:	:	:	:	relaxation
complexity		:	X	:	:	:	:	simplicity



SWINGING AREA

Objectives:
 concept formation
 large/small muscle development
 positive self-image
 personal courage

Participants:

1	2	3	4-6
		x	x
			x
x	x	x	
x	x	x	
x	x	x	
		x	x
			x
x	x	x	
x	x	x	
		x	x

Molecular Activities

- jumping
- pushing
- pulling
- stretching
- balancing
- imagination
- hanging
- sliding
- falling
- cooperating

Environmental Attributes:

communality	X	:	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	:	sociofugality
formality		:	X	:	:	:	:	informality
ambiguity		:	:	:	:	X	:	legibility
diversity		:	:	:	:	X	:	homogeneity
adaptability		:	:	:	:	X	:	fixity
stimulation	X	:	:	:	:	:	:	relaxation
complexity		:	:	:	:	X	:	simplicity



CLIMBING AREA

Objectives:

- concept formation
- eye-hand coordination
- large muscle development
- personal courage

Participants:

	1	2	3	4-6
	x	x	x	x
	x	x	x	x
			x	x
	x	x	x	x
				x
	x	x	x	x
			x	x

Molecular Activities:

- reaching
- stretching
- climbing
- balancing
- hanging
- falling
- imagination

Environmental Attributes:

communality	x	:	:	:	:	:	privacy
sociopetality	x	:	:	:	:	:	sociofugality
formality	x	:	:	:	:	:	informality
ambiguity		:	:	:	:	x	legibility
diversity	x	:	:	:	:	:	homogeneity
adaptibility		:	:	:	:	x	fixity
stimulation	x	:	:	:	:	:	relaxation
complexity	x	:	:	:	:	:	simplicity



SAND AREA

Objectives:

- concept formation
- sensory and perceptual acuity
- large/small muscle development
- positive self-image

Participants:

	1	2	3	4-6
		x	x	x
		x	x	x
	x	x	x	x
	x	x	x	x
		x	x	x
		x	x	x
	x	x	x	x
	x	x	x	x
			x	x
	x	x	x	

Molecular Activities:

- bending
- squatting
- crawling
- digging
- carrying
- lifting
- touching
- sitting
- measuring
- forming

Environmental Attributes:

communality	x	:	:	:	:	:	privacy
sociopetality	x	:	:	:	:	:	sociofugality
formality		x	:	:	:	:	informality
ambiguity		:	:	:	:	x	legibility
diversity	x	:	:	:	:	:	homogeneity
adaptibility		:	:	:	:	x	fixity
stimulation	x	:	:	:	:	:	relaxation
complexity		x	:	:	:	:	simplicity



Objectives:
 intellectual development
 communication ability
 concept formation

GROUP LEARNING AREA

Participants:				Molecular Activities:
M	F	S	V	
x	x	x	x	lecturing
x	x			asking questions
x	x	x	x	seminar
x	x	x	x	operating audio/visual equipment
x	x	x	x	displaying visual material
x	x			problem solving

Environmental Attributes:

communality	x	:	:	:	:	:	:	privacy
sociopetality	x	:	:	:	:	:	:	sociofugality
formality	x	:	:	:	:	:	:	informality
ambiguity	:	:	:	:	:	x	:	legibility
diversity	:	:	:	:	:	x	:	homogeneity
adaptability	:	x	:	:	:	:	:	fixity
stimulation	x	:	:	:	:	:	:	relaxation
complexity	x	:	:	:	:	:	:	simplicity



Objectives:
 intellectual development
 educational achievement
 positive self-image

INDIVIDUAL LEARNING AREA

Participants:				Molecular Activities:
M	F	S	V	
x	x			thinking
x	x			reading
x	x			writing
x	x			learning to read/write
x	x	x	x	tutoring/being tutored
x	x			using programmed learning materials
x	x			concept formation
x	x			problem solving

Environmental Attributes:

communality	:	:	:	:	:	:	:	x	privacy
sociopetality	:	:	:	:	:	:	:	x	sociofugality
formality	:	x	:	:	:	:	:	:	informality
ambiguity	:	x	:	:	:	:	:	:	legibility
diversity	:	x	:	:	:	:	:	:	homogeneity
adaptability	:	x	:	:	:	:	:	:	fixity
stimulation	x	:	:	:	:	:	:	:	relaxation
complexity	:	x	:	:	:	:	:	:	simplicity



READING AREA

Objectives:
 intellectual stimulation
 acquisition of information

Participants:

M F S V
 x x
 x x
 x x
 x x
 x x
 x x

Molecular Activities:

reading
 browsing
 relaxing
 sitting
 isolating oneself
 manipulating auto-tutorial materials

Environmental Attributes:

communality ___ : ___ : ___ : **X** : ___ privacy
 sociopetality ___ : ___ : ___ : ___ : **X** sociofugality
 formality ___ : ___ : ___ : **X** : ___ informality
 ambiguity ___ : **X** : ___ : ___ : ___ legibility
 diversity ___ : ___ : ___ : **X** : ___ homogeneity
 adaptability ___ : **X** : ___ : ___ : ___ fixity
 stimulation ___ : ___ : ___ : **X** : ___ relaxation
 complexity ___ : **X** : ___ : ___ : ___ simplicity



SEWING AREA

Objectives:
 achievement motivation
 homemaking skills development

Participants:

M F S V
 x
 x
 x
 x
 x
 x
 x
 x
 x x
 x x
 x x
 x x
 x x x
 x x

Molecular Activities:

cutting
 fitting/altering
 making patterns
 modeling
 sewing
 knitting
 ironing
 studying materials, use of equipment
 decorating
 storing projects, etc.
 cleaning up
 displaying
 teaching
 asking questions

Environmental Attributes:

communality ___ : **X** : ___ : ___ : ___ privacy
 sociopetality ___ : ___ : ___ : ___ : **X** sociofugality
 formality **X** : ___ : ___ : ___ : ___ informality
 ambiguity ___ : ___ : ___ : **X** : ___ legibility
 diversity **X** : ___ : ___ : ___ : ___ homogeneity
 adaptability ___ : **X** : ___ : ___ : ___ fixity
 stimulation **X** : ___ : ___ : ___ : ___ relaxation
 complexity **X** : ___ : ___ : ___ : ___ simplicity



Objectives:
achievement motivation
self-expression

ARTS AND CRAFTS AREA

Participants:
M F S V

x	x		
x	x		
x	x		
x			
x	x	x	
x	x	x	
x	x	x	x
x	x	x	x

Molecular Activities:

painting
drawing
sculpting
flower arranging
cleaning up
storing projects, materials, etc.
displaying projects, visual materials
instructing

Environmental Attributes:

communality	x	:	:	:	:	privacy
sociopetality	x	:	:	:	:	sociofugality
formality	:	:	:	:	x	informality
ambiguity	x	:	:	:	:	legibility
diversity	x	:	:	:	:	homogeneity
adaptability	x	:	:	:	:	fixity
stimulation	x	:	:	:	:	relaxation
complexity	x	:	:	:	:	simplicity



Objectives:
positive self-image
health maintenance

PHYSICAL FITNESS ACTIVITY AREA

Participants:
M F S V

x	x	x	
x	x	x	
x	x	x	x

Molecular Activities:

exercising
weight watching
sports

Environmental Attributes:

communality	x	:	:	:	:	privacy
sociopetality	x	:	:	:	:	sociofugality
formality	:	:	:	:	x	informality
ambiguity	:	x	:	:	:	legibility
diversity	:	:	:	x	:	homogeneity
adaptability	:	x	:	:	:	fixity
stimulation	:	x	:	:	:	relaxation
complexity	:	x	:	:	:	simplicity



Objectives:
 achievement motivation
 socialization
 skill development

REPAIR AND CONSTRUCTION AREA

Participants:

M	F	S	V
x	x		
x	x		
x	x		
x	x		
x	x	x	
x	x		
x	x		
x	x		
x	x		
x	x		

Molecular Activities:

- carpentry
- refinishing
- small appliance repair
- automotive repair
- instructing
- relaxing
- snacking
- drinking
- listening to radio

Environmental Attributes:

communality	X	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	sociofugality
formality		:	:	:	:	X	informality
ambiguity	X	:	:	:	:	:	legibility
diversity	X	:	:	:	:	:	homogeneity
adaptability	X	:	:	:	:	:	fixity
stimulation	X	:	:	:	:	:	relaxation
complexity	X	:	:	:	:	:	simplicity



Objectives:
 personal consultation
 staff/participation involvement
 problem solving

CONSULTATION AREA

Participants:

M	F	S	V
x	x	x	
x	x	x	
x	x		
		x	
		x	
x	x	x	

Molecular Activities:

- interviewing
- screening
- waiting
- using records
- telephoning
- smoking

Environmental Attributes:

communality		:	:	:	:	X	privacy
sociopetality	X	:	:	:	:	:	sociofugality
formality	X	:	:	:	:	:	informality
ambiguity		:	:	:	:	X	legibility
diversity		:	:	:	:	X	homogeneity
adaptability		:	:	:	:	X	fixity
stimulation		X	:	:	:	:	relaxation
complexity		:	:	:	:	X	simplicity



Objectives:
 communication
 interaction of participants

CONFERENCE AREA

Participants:

M	F	S	V
x	x	x	x
x	x	x	x
x	x	x	x
x	x	x	x
x	x	x	x
x	x	x	x

Molecular Activities:

lecturing
 asking questions
 seminar
 displaying visual material
 operating audio/visual equipment
 smoking

Environmental Attributes:

communality	X	:	:	:	:	:	privacy
sociopetality	X	:	:	:	:	:	sociofugality
formality	X	:	:	:	:	:	informality
ambiguity	:	:	:	:	:	X	legibility
diversity	:	:	:	:	X	:	homogeneity
adaptability	:	:	:	:	X	:	fixity
stimulation	X	:	:	:	:	:	relaxation
complexity	:	X	:	:	:	:	simplicity



Objectives:
 personnel direction
 document handling
 program coordination

CLERICAL AREA

Participants:

M	F	S	V
		x	
		x	
		x	
		x	
		x	
		x	
		x	

Molecular Activities:

dictation
 typing
 filing
 bookkeeping
 mailing
 reproduction of documents
 telephoning

Environmental Attributes:

communality	:	:	:	:	X	:	privacy
sociopetality	:	:	:	:	:	X	sociofugality
formality	X	:	:	:	:	:	informality
ambiguity	:	:	:	:	:	X	legibility
diversity	:	:	:	:	:	X	homogeneity
adaptability	:	X	:	:	:	:	fixity
stimulation	X	:	:	:	:	:	relaxation
complexity	:	X	:	:	:	:	simplicity



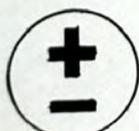
Objectives:
nonparticipant view of
children's activity area

OBSERVATION AREA

Participants:				Molecular Activities:
M	F	S	V	
x	x	x	x	viewing
x	x	x	x	listening
x		x	x	writing
		x	x	taking pictures
		x	x	operating audio/visual taping equipment
x	x	x	x	talking

Environmental Attributes:

communality	:	x	:	:	:	privacy
sociopetality	:	:	:	:	:	x sociofugality
formality	x	:	:	:	:	informality
ambiguity	:	:	:	:	:	x legibility
diversity	:	:	:	:	:	x homogeneity
adaptability	:	:	:	:	:	x fixity
stimulation	:	:	x	:	:	relaxation
complexity	:	:	:	:	:	x simplicity



Objectives:
subject testing
planning and evaluation

RESEARCH AREA

Participants:					Molecular Activities:
C	M	F	S	V	
			x		studying
			x		reading
			x		writing
			x		keeping records
			x	x	designing experiments
x	x	x	x	x	testing
	x	x	x	x	instructing
			x	x	discussing

Environmental Attributes:

communality	:	:	:	:	x	privacy
sociopetality	:	:	:	:	x	sociofugality
formality	:	x	:	:	:	informality
ambiguity	x	:	:	:	:	legibility
diversity	:	x	:	:	:	homogeneity
adaptability	x	:	:	:	:	fixity
stimulation	x	:	:	:	:	relaxation
complexity	x	:	:	:	:	simplicity



Objectives:
highly concentrated activity
independence

INDIVIDUAL WORK AREA

Participants:

M	F	S	V
		x	
		x	
		x	
		x	
	x	x	
		x	

Molecular Activities:

- studying
- reading
- writing
- keeping records
- consultation
- telephoning

Environmental Attributes:

communality	:	:	:	:	X	privacy
sociopetality	:	:	:	:	X	sociofugality
formality	:	X	:	:	:	informality
ambiguity	:	:	X	:	:	legibility
diversity	:	:	X	:	:	homogeneity
adaptibility	X	:	:	:	:	fixity
stimulation	:	:	X	:	:	relaxation
complexity	:	X	:	:	:	simplicity



Objective:
socialization

LOUNGE AREA

Participants:

M	F	S	V
x	x		
x	x		
x	x		
x	x		
x	x		
x	x		

Molecular Activities:

- chatting
- relaxing
- sitting
- snacking
- drinking
- smoking

Environmental Attributes:

communality	X	:	:	:	:	privacy
sociopetality	X	:	:	:	:	sociofugality
formality	:	:	:	X	:	informality
ambiguity	:	X	:	:	:	legibility
diversity	X	:	:	:	:	homogeneity
adaptibility	:	X	:	:	:	fixity
stimulation	:	X	:	:	:	relaxation
complexity	:	X	:	:	:	simplicity

Design Development

The physical design of the parent-child center is based on proximal grouping of the individual activity areas according to programmatic activity patterns: Nursery Training Program Areas (Figure 1), Adult Participant Program Areas (Figure 2), and Administrative Services Areas (Figure 3). As a requirement of and focal point for participant, staff, and visitor activities, "Reception" is hypothesized to be the unifying (area) element common to all (Figure 4).

The strength of the proximal relationship is indicated by the number of lines joining any two areas:

slight 

moderate 

great 

In Figure 5, compatible activity areas are combined schematically into common spaces; connecting lines denote frequency of circulation. *Comprograph 2*, a systems space allocation routine, was utilized as a technique relating proximal relationships and (programmatic) spatial definitions. The resulting diagrams (Figures 6, 7, 8, and 9) are characteristic of this analysis procedure in terms of assumed physical area. Next, schematic diagrams of major areas were developed (Figures 10, 11, and 12). These represent a synthesizing of program concept and analysis. The design development drawings and model photographs (Figures 13, 14, 15, and following pages) are an expression of a physical solution for a proposed facility in Winston-Salem, North Carolina.

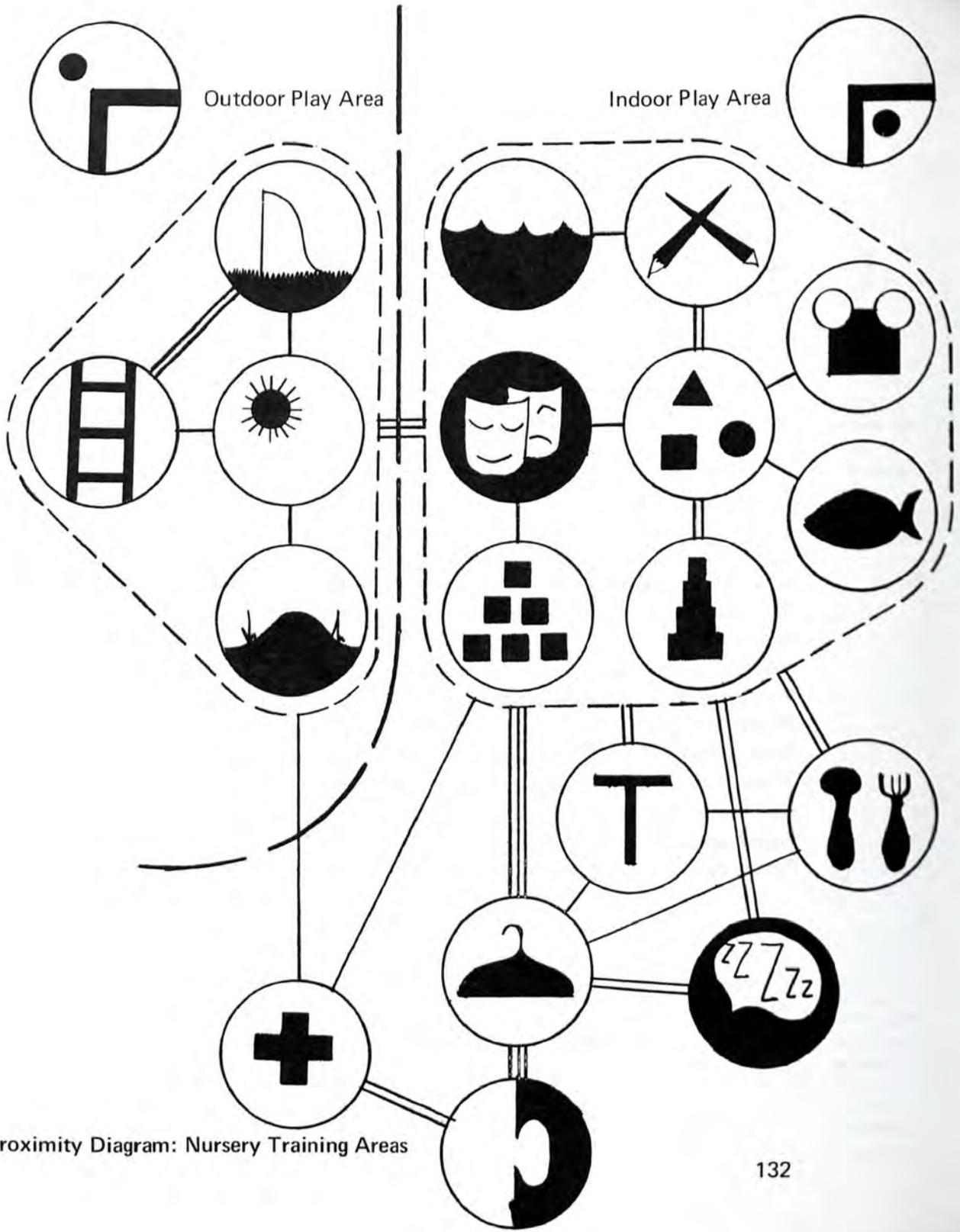


Figure 1. Proximity Diagram: Nursery Training Areas

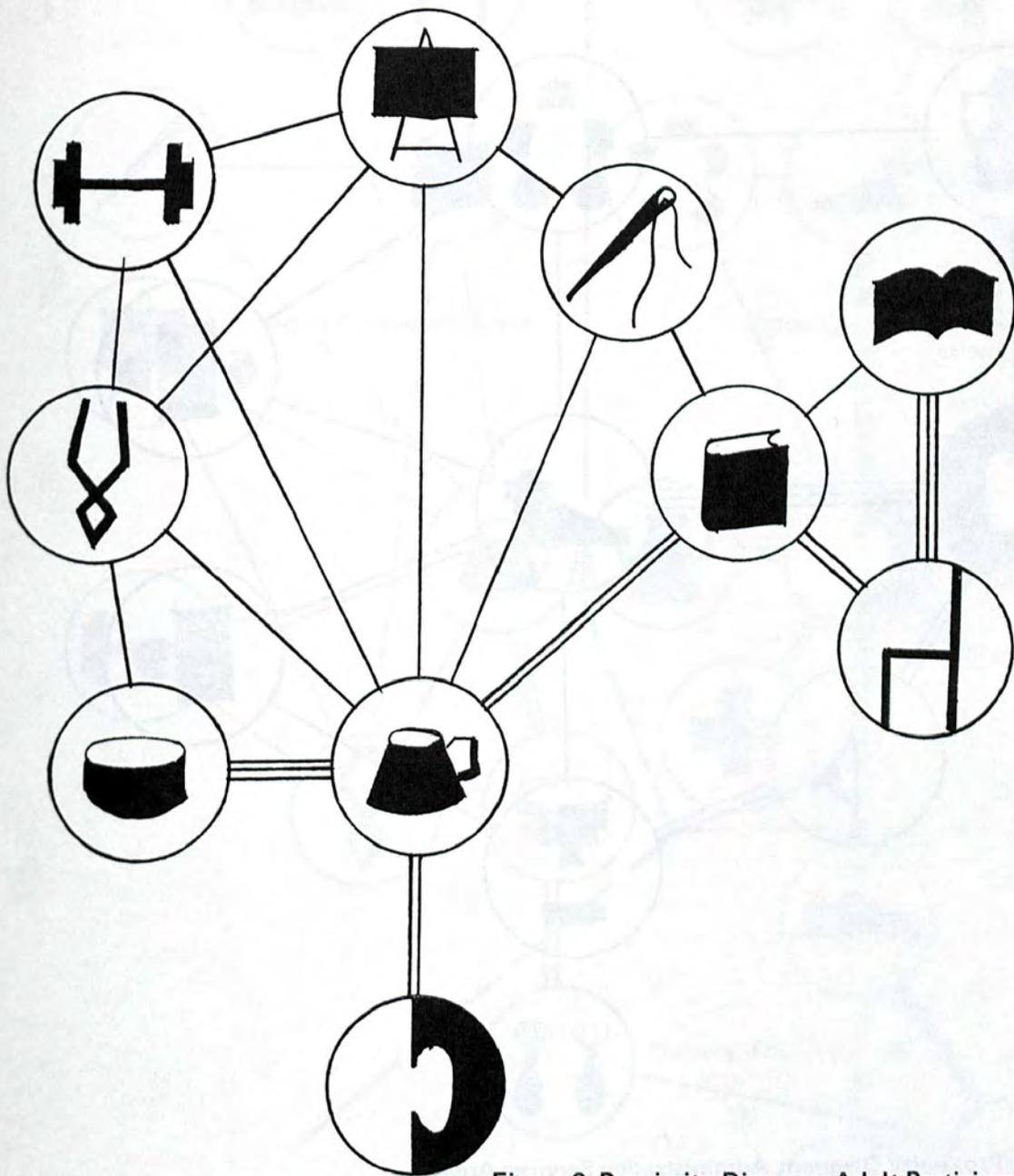


Figure 2. Proximity Diagram: Adult Participant Areas

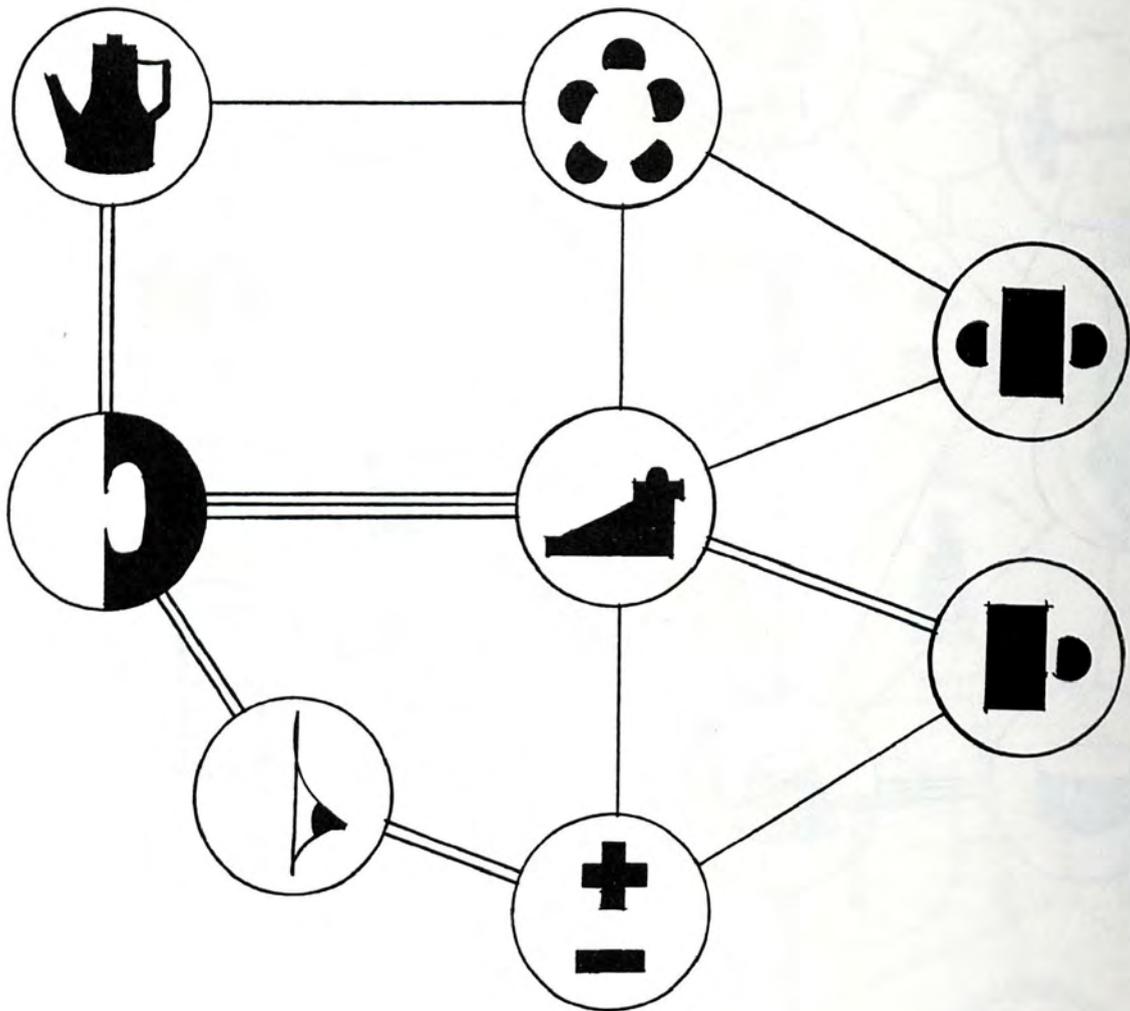


Figure 3. Proximity Diagram: Administrative Services Areas

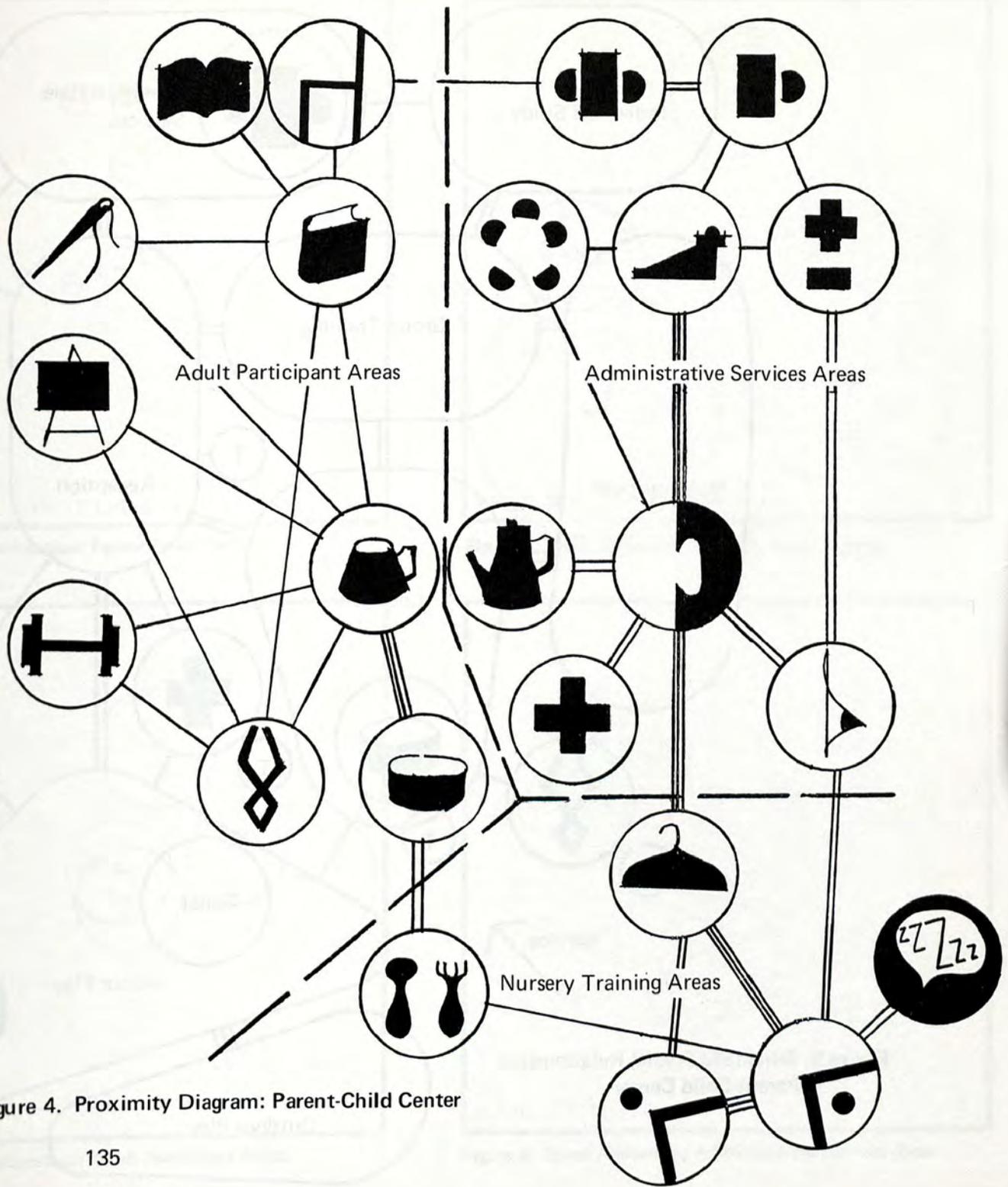


Figure 4. Proximity Diagram: Parent-Child Center

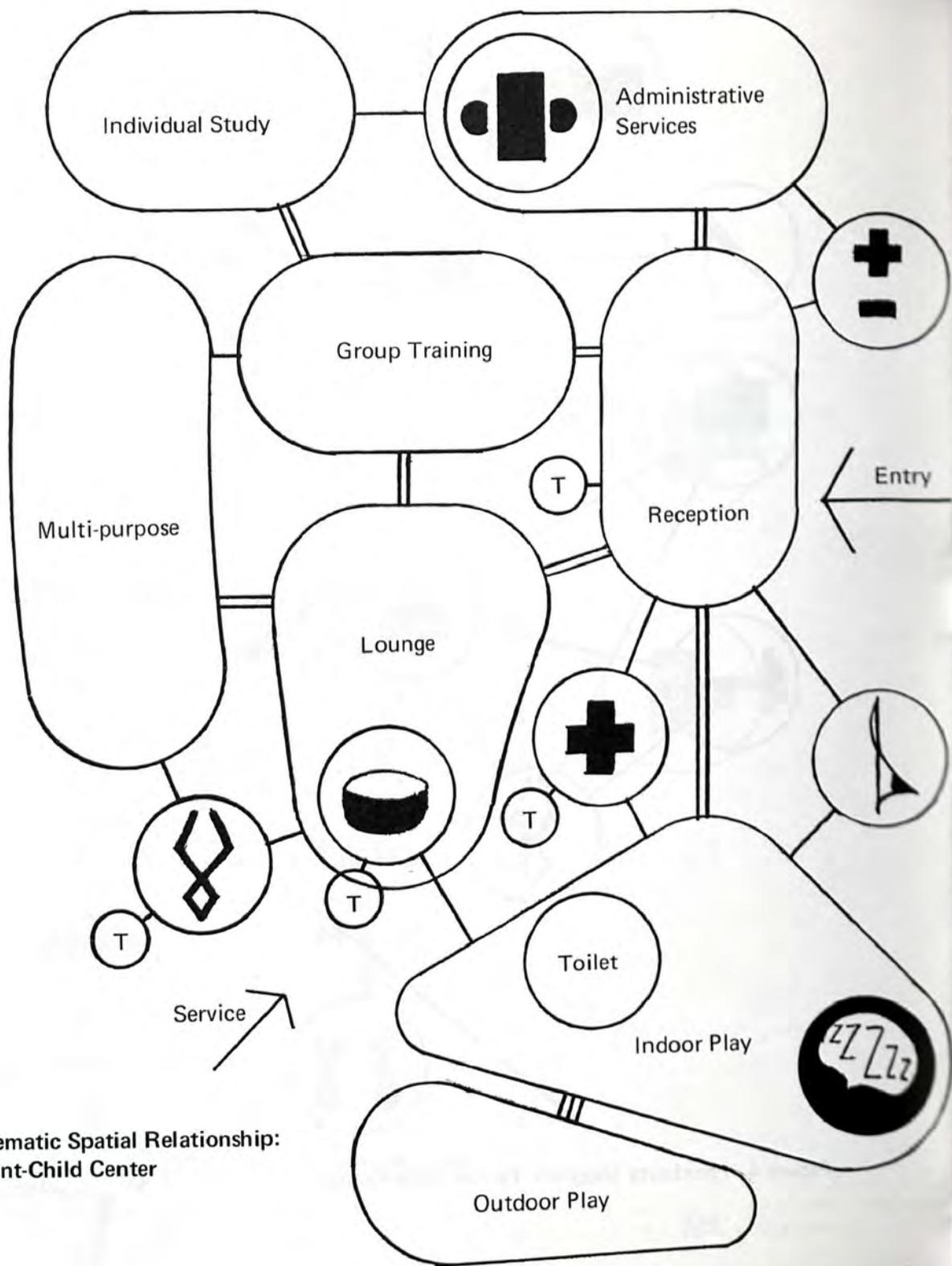


Figure 5. Schematic Spatial Relationship: Parent-Child Center

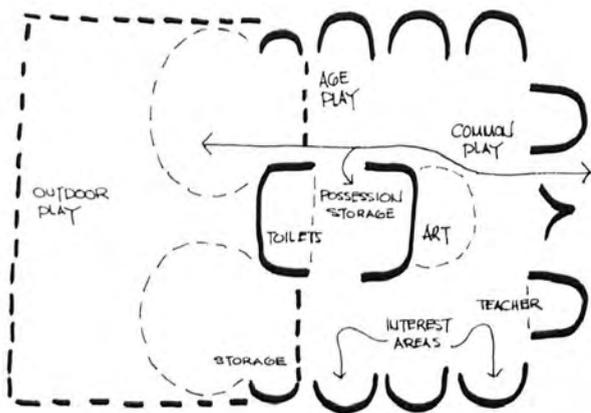


Figure 10. Diagram of Nursery Training Area

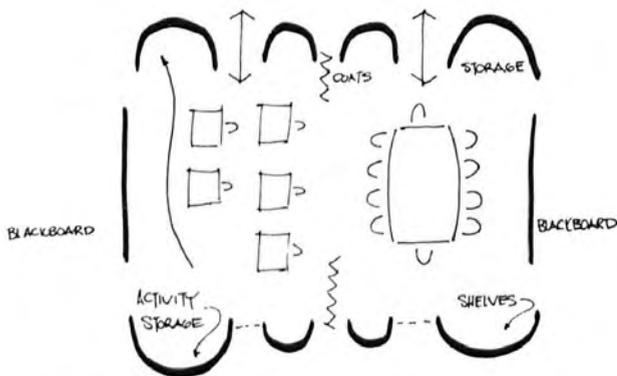


Figure 11. Diagram of Mother's Training Area

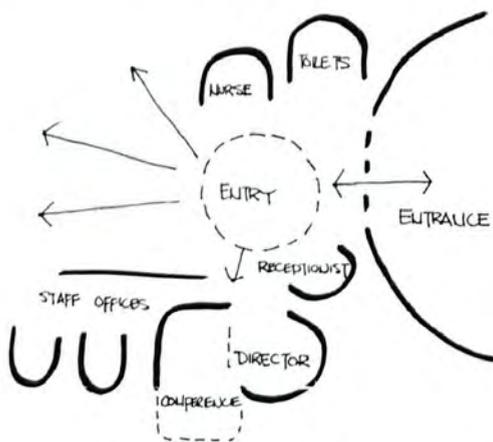
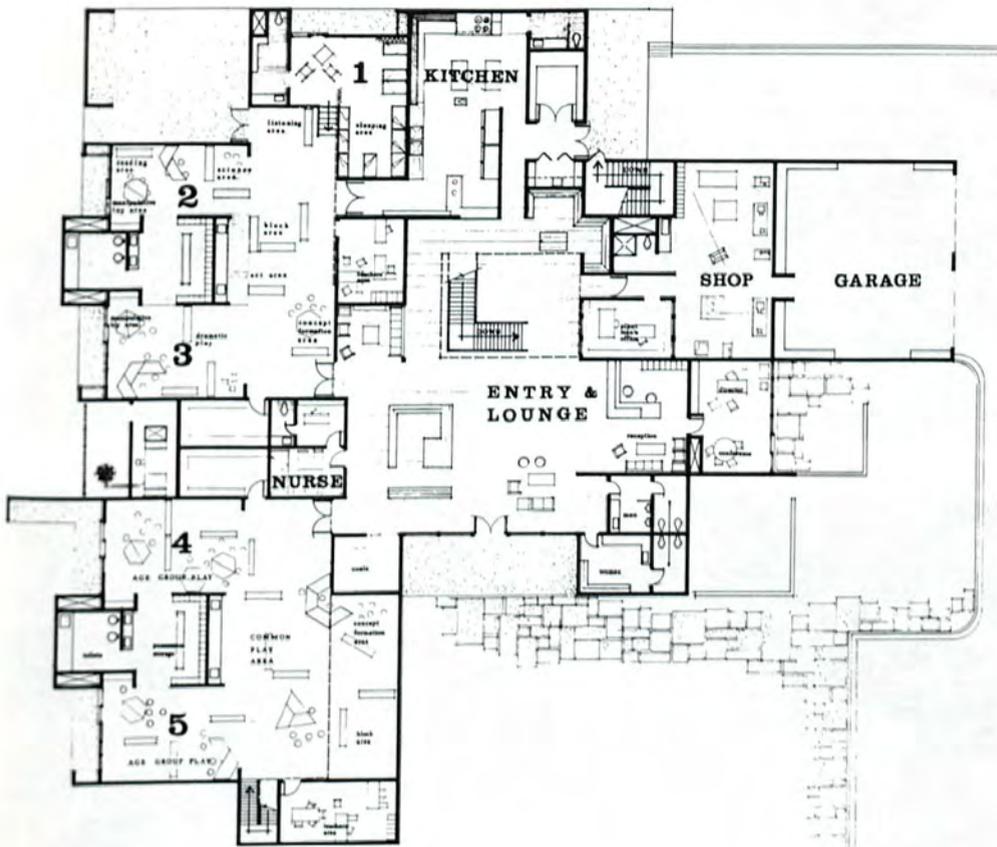
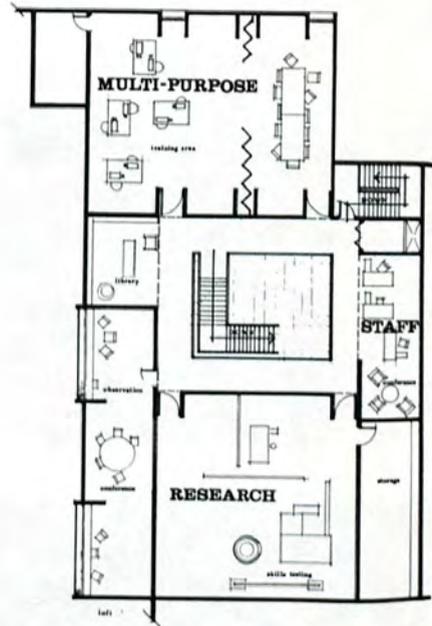


Figure 12. Diagram of Administrative Area



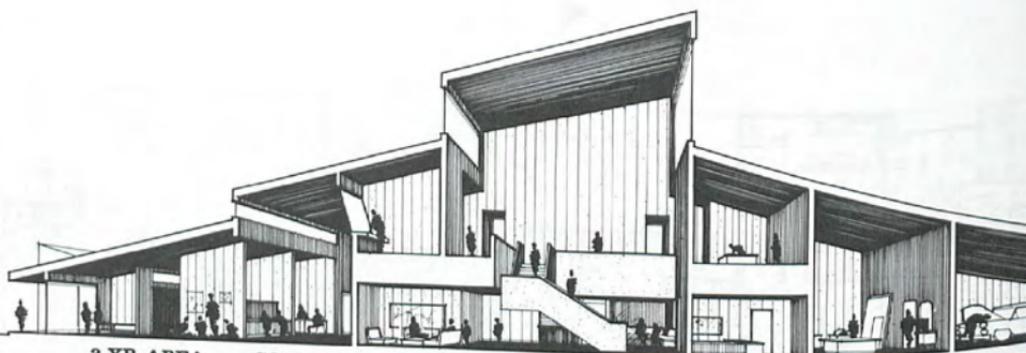
GROUND FLOOR PLAN

SCALE 10 FEET



FIRST FLOOR PLAN

SCALE 10 FEET



3 YR AREA

COMMON

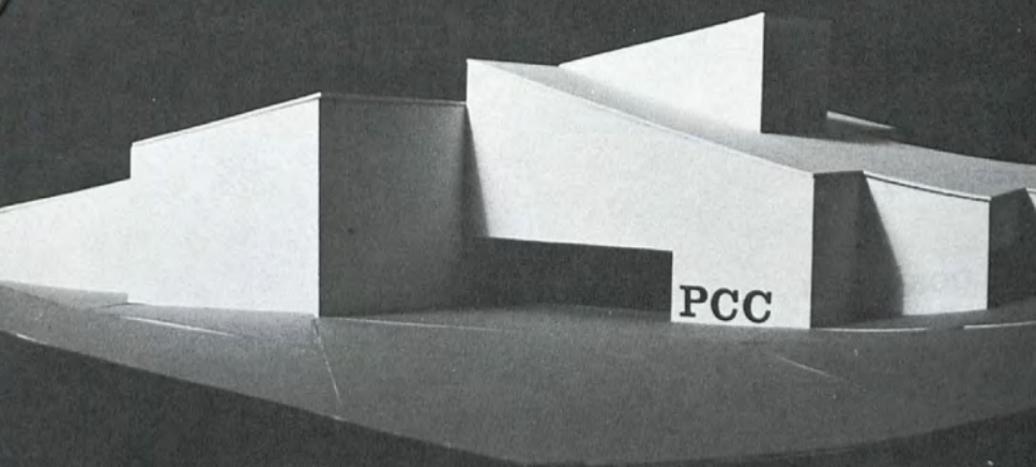
ENTRY & LOUNGE

PLANT
OFFICE

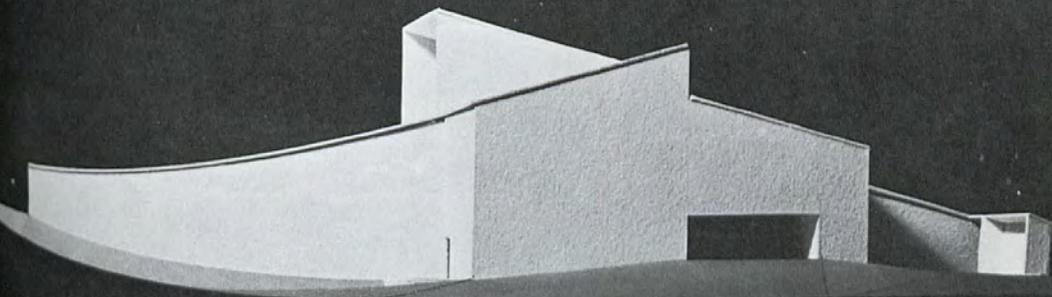
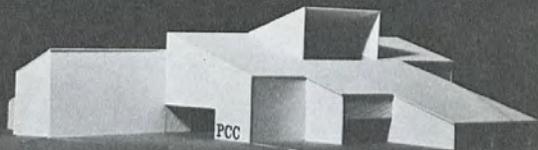
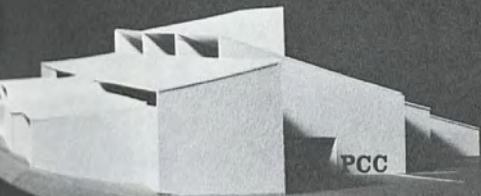
SHOP

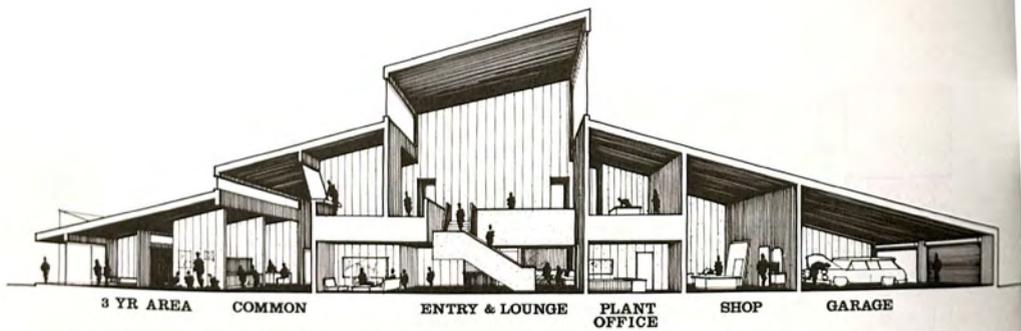
GAR

TRANSVERSE SECTION

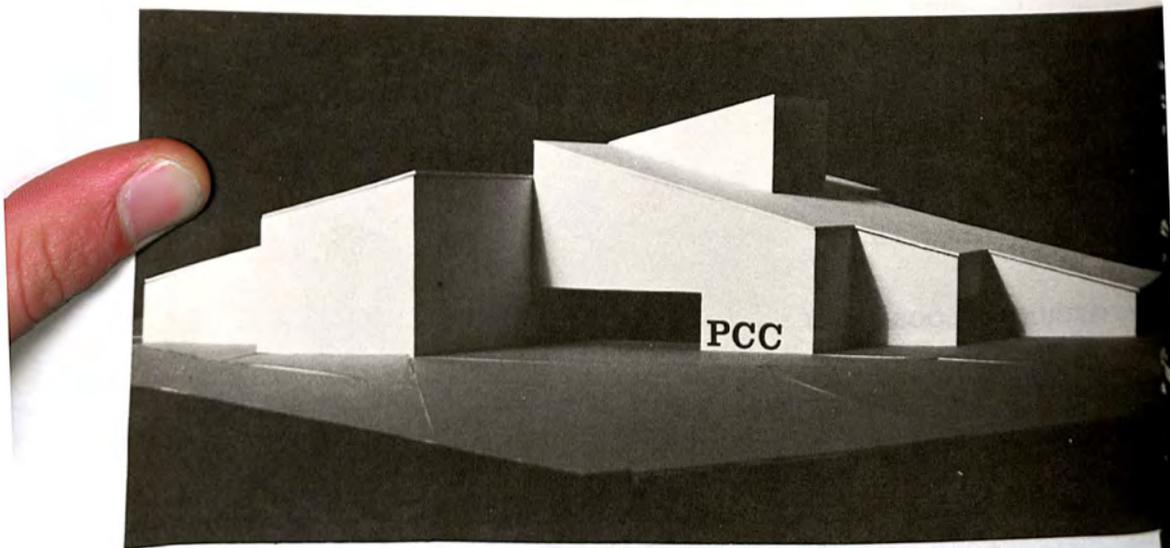


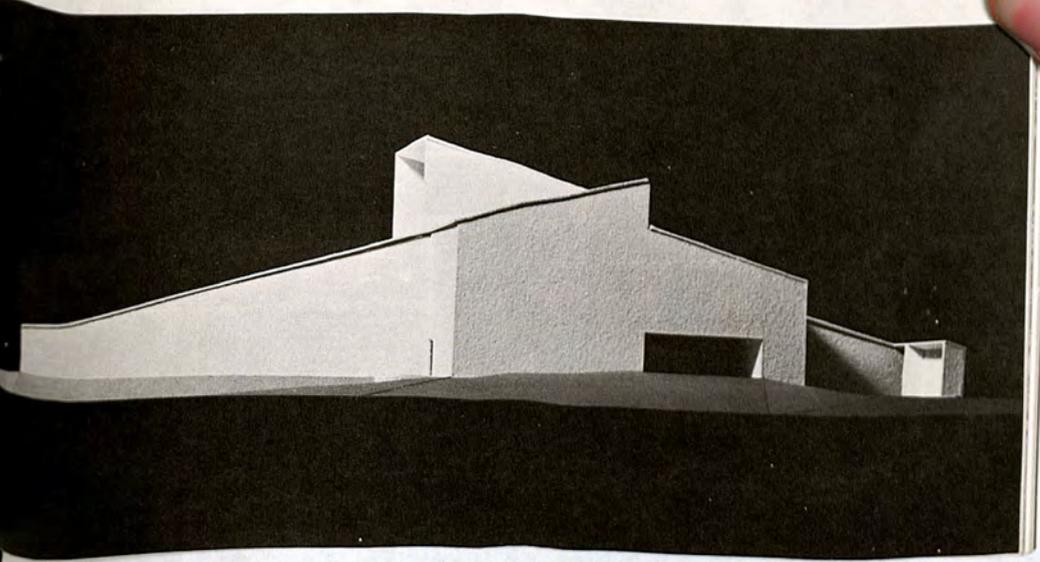
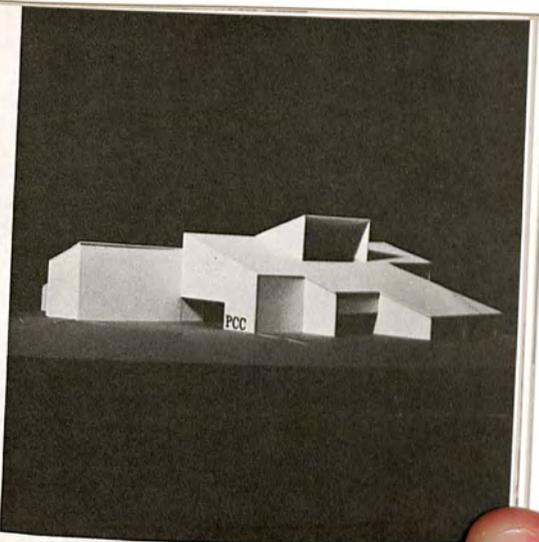
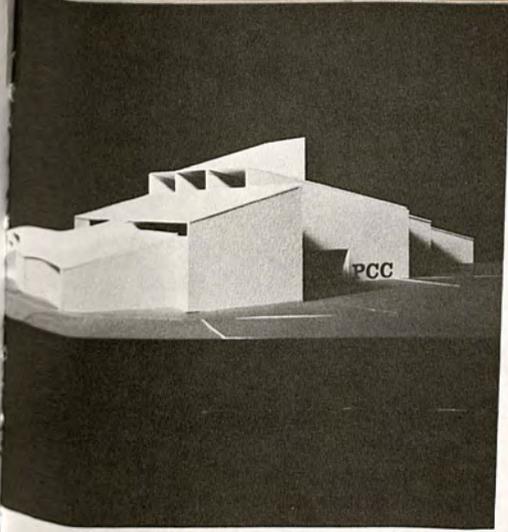
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TRANSVERSE SECTION







Community Participation in Child Development

Donald Cohen, Robert Lauricella, Daniel Ross, Joan Sanoff

The emergence of early learning in America today is being advanced for two main reasons. First, research psychologists like Bloom, Deutsch¹ and others have demonstrated by their experiments that a child's intelligence is not fixed at birth, but in fact, can be dramatically affected by the child's experiences and his environment, especially in the very early years. Secondly, growing awareness of the influence of poverty and environmental deprivation on a child's intellectual development has given these findings an urgent practical application. Early learning is essential if environmentally deprived children are to have any real chance for a successful school experience.

The most damaging aspect of poverty is its continuing cycle. The cycle begins with a lack of income which prevents the children from being reared in a suitable environment; the environmentally deprived child enters school, fails because of his background, and drops out of school as soon as possible; he returns to his slum, with its frustrations, crime, mental illness, and unemployment to raise the next generation—to repeat the same cycle. The first step out of the cycle of despair is to provide the mother with the opportunity to become a wage earner. When there is no support the opportunity to become a wage earner would give a sense of independence and self-worth. In families where there is a father, her income would be welcomed. Thus, the goals of a Child Development Program are two-fold: to provide an opportunity for the mother to recognize her own self-worth and to provide the child with an environment which will help him acquire sufficient fundamentals of social and intellectual functioning so that both may help break the continuing cycle of poverty.

One of the major objectives of the Child Development Program is to help children develop a positive self-concept.² Children, particularly those in minority groups, are forming negative self-concepts by the age of three or four. When a child lives in an environmentally deprived home, the problems of difference are compounded. He may not have enough to eat or wear. His family is likely to be larger than most and it may be headed by defeated adults. If the father is in the family, his position may be insecure; perhaps he cannot guarantee support for his wife or food for his family. The mother is often more likely to obtain employment which takes her out of the home with no one to replace her and no labor-saving devices to ease her work. The defeat of the adults is passed on to the children. A tired, worried mother has little time or energy left to give to her child, regardless of how much she may love him. Thus, the child development program concentrates on improving the child's self-concept in the school environment by accepting and appreciating individual differences the child brings to the center. The positive aspects of the child's culture are stressed and opportunities to help spark the child's pride in his heritage are stressed.

Over a period of time educational and economic gains can help compensate for many factors in our society that cause a negative self-image among so many, especially those who belong to minority races. Ultimately, people will move beyond mere tolerances of racial, cultural, or religious differences to a point where they will value diversity as an asset. However, we have not arrived at that point. That is why the development of a positive self-image is one of the two major goals of a Child Development Program.

Intellectual development, the second major goal, includes the development of the senses and perceptual acuity, language ability, problem-solving ability and concept formation ability. Sense development and perception are important because the senses are the sources of the data for the intellectual process. Probably all children would benefit from learning experiences that would help them develop their senses. There is considerable evidence that because of their environment, children from poverty level homes need special help to learn to make use of their senses. The significance of language development is obvious for communication and as a necessary prerequisite to the development of the thought process. Most of these children have developed a useable language for communicating with their families and peers but it is not the same as the more precise language that is needed in reasoning. Their home

language usually requires a common background by speaker and listener for mutual comprehensibility. It involves the use of gestures. The structure is simple and predictable, but the language needed for the abstract thought process cannot depend upon a common background or on gestures and reflections to carry the meaning. There is a distinction made between two types of concepts: specific concepts such as over, under, behind, beside, and concepts that are categories in a classification system. These latter concepts provide for generalizing and delimiting at the same time. Such concepts as fruits, vegetables, foods, color and shape are examples. Although the ability to use concepts is crucial in the thought process, many children from poverty situations rarely have the ability to use even the simpler ones. Problems are classified as physical, interactional or affective.⁵ A physical problem is one that involves an individual and his physical environment. Problems in arithmetic and mathematics are examples. Interactional problems involve two or more individuals. The distinction is that the individual deals with or manipulates his physical environment; it does not manipulate him; but in an interactional problem, he manipulates others and they also manipulate him. A physical problem is highly predictable, but in an interactional problem, the action-reaction is continuous and less predictable. The more emotional overtones a problem has, the less predictable its outcome and the more affective it becomes. Children must learn to solve all three problems. It is not only essential to solve academically oriented problems but, equally important, he must learn to cope with his environment in the city or country-side.

In order to achieve the two basic objectives of the Program the emphasis needs to be upon the child as a learner rather than upon the teacher as a dispenser of wisdom. The task is to create an environment rich in learning possibilities and then to enable the child to explore it freely and make his own discoveries. The child should be free to explore and free to use anything he can reach. A child can remain with an activity as long as he likes, leave it when he pleases, or reject it altogether at the outset. The environment should be arranged so that the child is likely to make a series of interconnected discoveries about his physical and social world. Toys that are self-correcting are used wherever possible.

Michael Harrington³ suggested that despite their abundance, the poor in our society were really invisible – invisible not because they were not everywhere in evidence but because we refuse to see them. In the past few years social legislation for social

action has increased our awareness but in so doing has high-lighted the disabilities as to cause them to be seen even when they do not exist. Therefore, it may be stated somewhat ironically, that one of the objectives of the concept of Child Development Program is to decrease the visibility of the poverty level child by helping him acquire sufficient fundamentals of social and intellectual functioning so that he will be less a burden than a joy to the teachers he will later encounter.

Description of Community

The Little River Community of which Zebulon is the principle township is primarily a farming community with a total population of 5,718 of which 3,343 are non-white. The principal crop produced is tobacco which means hard seasonal labor from August, peak in September, dwindling until December. Only 14.3% of the population work off the farm. There are two principal industries in Zebulon: one a knitting mill employing 40 women and a tool and dye factory employing 90 men and 10 women.

A survey conducted by the Little River Community Action Center revealed that out of 1,350 families there were 737 who had an income of less than \$3000. Of this 74.2% are non-white. In this predominately low and marginal income concentrated area there are 366 married couples with their own children under 6 years of age. There are 103 married women, with husbands present who are in the labor force.

With the level of income so low it is imperative that jobs become available to raise incomes above poverty level. With the availability of jobs for women the demand for child-care increases. Yet, in spite of this demand there is one kindergarten and no day-care listed for the Little River Community. Out of 650 families surveyed there are 103 women with children under six who worked — of these 76 had to have relatives or neighbors care for their children. In response to the question, "Would you like a Day Care Center?" 286 out of 320 answered yes. In response to the question "If there were such a center to care for your children would you like to go to work?" 147 out of 200 answered yes. The need was apparent for the establishment of a center as a setting for children that would be as stimulating as possible as well as to reinforce the parent's role and give insights in child-development and how they contribute to this development.

Parent Participation

The Parent-Child Development Center, Inc.⁴ was formed in November 1969 by the Little River Community Action Center, Zebulon, North Carolina, under the supervision of Daniel Ross. The primary purpose of the center was to aid those families in the community who are burdened and frustrated by poverty. The center would permit mothers of young children on ADC or of very low income to take a job or enter a training program. It would also give support and vision to parents as to what is good education and care of children as well as provide trainees in the New Careers Program who are usually welfare recipients or are of very low income.

Prior to the formal establishment of this organization several meetings were held with interested parents and members of the CAC. The parents who attended the meetings indicated that such a program would mutually benefit the children who could profit from a pre-school educational experience as well as the mothers who would be able to seek or sustain employment to supplement the family income. Since funding from outside sources was unavailable, it was agreed that the parents, with the assistance of CAC and CDG would establish their own center supported by their own efforts. The Board of Directors of the Wakefield Baptist Church at a meeting in November 1969 agreed to provide the church basement to house the children's center.

Applicants were interviewed for the position of director of the center as well as two teacher's aids who were employed through the New Careers Job Development Program, Wake Opportunities. All the staff were residents of the community and the director holds a Masters Degree in Elementary Education.

The next phase of development included a fund raising program organized by the parents committee which included a teenager's dance and a soul food barbeque from which sufficient funds were raised to begin the purchase of building materials.

In February 1970 renovation of the church basement had commenced. Designers from the CDG provided solutions for a physically enriching environment for a child development center. Together with the residents of the community and industrial art classes of the local high schools the center was painted, furniture constructed, spaces organized, toys constructed and donated for a March 1 opening.

Several industries in the Zebulon area were contacted for financial support for the center since they employ a large percentage of women. Recognizing that the success of a children's center would help to stabilize their work force, both Naomi Mills and Norwich Mills provided substantial support.

Parents will be expected to give some time to the center in the way of making toys, repairs, cleaning, etc., in addition to attending meetings to discuss the children's work, the center's objectives and to work toward common progress between home and school. Parents will also help pay the weekly tuition for their children on a gradual basis. The assumption of responsibility of the parents for them to become a real part of the center insofar as possible is the major goal.

The Child Development Center is both a concept and a community facility. In concept it represents the drawing together of all those resources: family, community and professional, which can contribute to the child's total development. It has long been recognized that there should be a great deal of interaction between parents and those who care for their children away from home. Working together, they can reinforce each other's efforts to help the child develop. Without cooperation neither can be fully effective.

Involvement of parents from poverty areas in pre-school programs requires special effort. Direct personal contact is necessary to bring favorable response from parents whose previous attempts to secure the better things of life have encountered scorn or rebuff. Parents will respond with integrity and responsibility when made to feel wanted, needed and accepted. This can be done by involving the parents actively in the program. There must be a willingness on the part of each group to accept the sincere interests, good intentions and competence of the other. Parents are encouraged to participate in the program as part or full time employees or as volunteers. They can do whatever they feel most competent with, provide transportation, serve as aides, maintain and repair the building. Every effort should be made to capitalize on the skills, talents and unusual experiences of parents by sharing them with the children of the group, and in some cases with parents at a group meeting. Every community has unique and interesting people and resources unknown to many children and often to adults, though they are readily available. To professional workers the parents and the community can become a rich source of curriculum

materials, making their task easier and more rewarding.

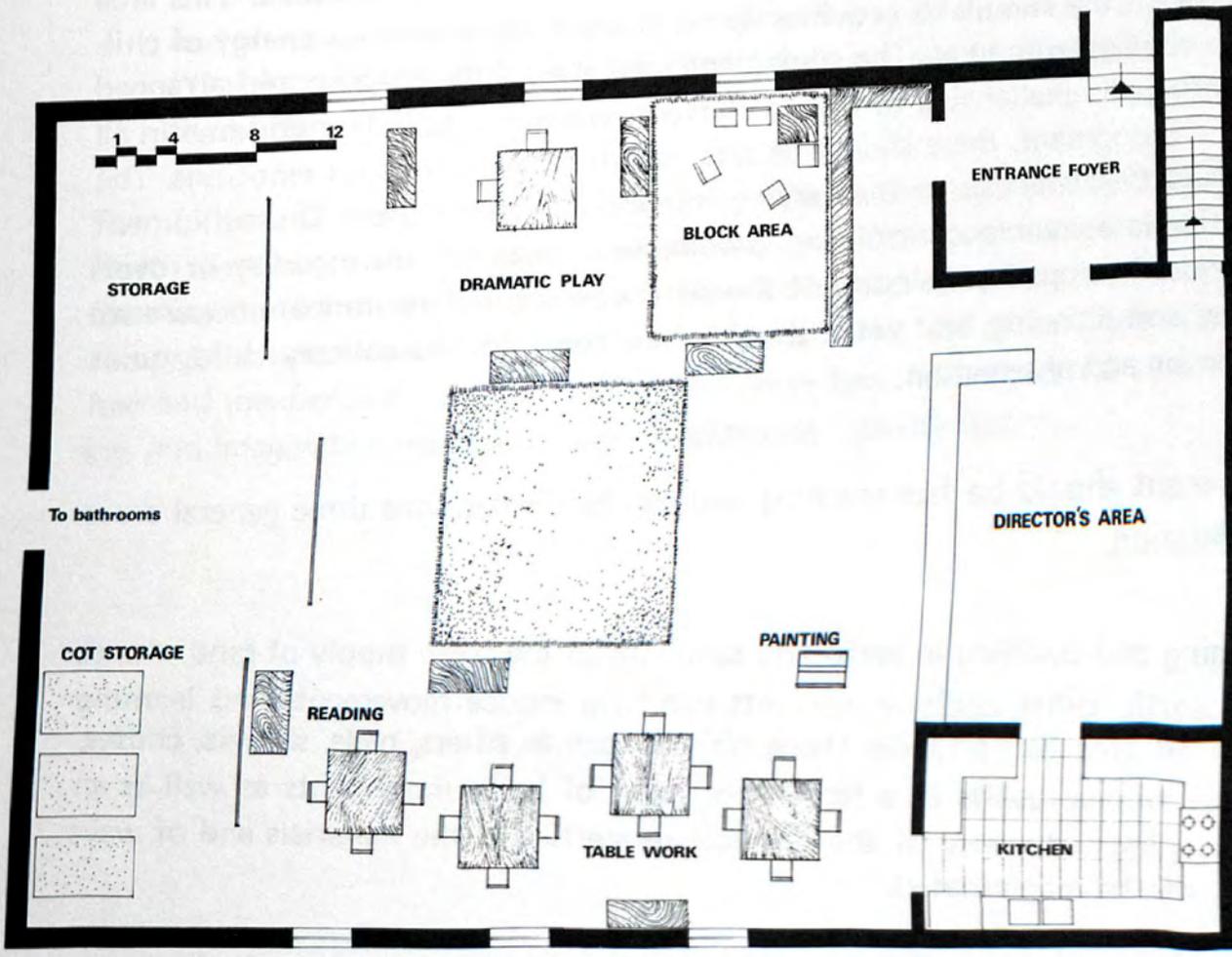
A long range objective of the Parent-Child Development Center is the development of an education program for parents of young children coupled with a toy-lending library that the parents can use to aid the intellectual development of their children. These can be toys used in the classroom that is used by the staff in teaching learning episodes. Each toy will be accompanied by simple written instructions in their use and will help children develop their senses, their language skills and their concept formation and problem-solving abilities. In addition to the written instructions, a series of parent meetings will be held over a period of time to demonstrate to the parents how the material is used.

Joan Sanoff

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Deutsch, Martin "The Disadvantaged Child in the Learning Process," in *Education in Depressed Areas*, A.H. Parrow, ed., pp. 163-179. New York: Columbia Teachers College Press, 1963.
- 2 Nemnicht, Glenn and Orahe McAfee, John Meier, *The New Nursery School*. New York: General Learning Corporation, 1969.
- 3 Harrington, Michael, *The Other America*. Baltimore: Penguin Books, 1962.
- 4 Incorporation of the PCDC permits a tax exempt status and eligibility for reimbursement for food from the State School Food Services as well as the Food Surplus Program.
- 5 Anderson, A.R., "Some Principles for the Design of Clarifying Educational Environments," in *Handbook of Socialization Theory and Research*, D. Goslin, ed. Chicago: Rand McNally and Company, 1968.





THE PLAYGROUND

Everyone accepts the idea of a playground for a children's center, but too seldom do we stop to reason why there should be one, other than the obvious answer that the children need fresh air and exercise. A playground provides much more than that.

It is a learning center which should be safe, well-planned, and bounded. This area should provide the stimuli to activities which channel the enormous energy of children into vital growth areas. The equipment used should be designed and arranged to be continually challenging to a child's inventiveness and skill. For children in all stages of development, there should be safe, constructive outlets for emotions. The areas should be attractive to the varying interests of the children. The equipment should stimulate muscle control and development without endangering or overtaxing underdeveloped physiques. It should encourage self-assurance, cooperative social play and planning, and yet it should allow room for the solitary child, quiet play, thinking and observation.

All equipment should be fact-teaching and can be divided into three general areas of consideration.

1. **Digging and building in earth and sand.** Given the basic supply of sand, stones and earth, other additive elements can help induce movements and learning such an area can provide. Using objects such as sifters, pails, shovels, chutes, dump trucks results in a large assortment of body movements as well as an awakening awareness of the physical properties of the materials and of ways they can be manipulated.
2. **Climbing equipment.** Climbing equipment should not be geometric. The child learns the pattern quickly and the challenge is then gone and the equipment is then useless to stimulate the movement needs it is capable of providing. Assymetrical, irregular apparatus which has a variety of climbing sections to be mastered provides a continual challenge. These parts will change as the child matures in size and skill so that the piece maintains its interest. Provide a variety of materials to climb as each gives a different experience, e.g., rope which forces the child to cope with a constantly changing situation.

3. **Imaginative play.** "House" and construction materials should provide enough structure to stimulate ideas and activities but not to limit or govern them. A structure can be anything from an igloo or a skyscraper, but there should be a good supply of building materials to provide for these ideas. Boxes, outdoor blocks, boards and a tarpaulin work well for these do-it-yourself projects. Much planning, problem solving, cooperative and social play is inevitably incorporated into this area. Fact-learning comes from handling of various size and shape materials and from the engineering problems which must be solved. "Quiet corners" with just a box or a bench are good for imaginative play for the solitary child.

The following outdoor play of the Parent-Child Development Center, Zebulon, North Carolina, was a project undertaken by a first year Design class at North Carolina State University School of Design under the leadership of Rick Kattenburg. It suggests various ways to develop an outdoor area, and shows methods of using free and inexpensive materials. It uses the three basic activity centers (sand, climbing, and imaginative play) and develops additional activity factors.

Wakeneid Bajajuste CA

Cemetery

rotating tires

rotating see-saw

log swing

rotating swing

tire web

High Activity

dirt mounds

rope climber

balance beam

enclosure

flat spool

tires

observation tower

coil toys

Wooded Area

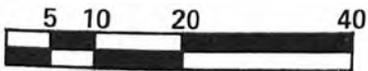
Low Activity

sand

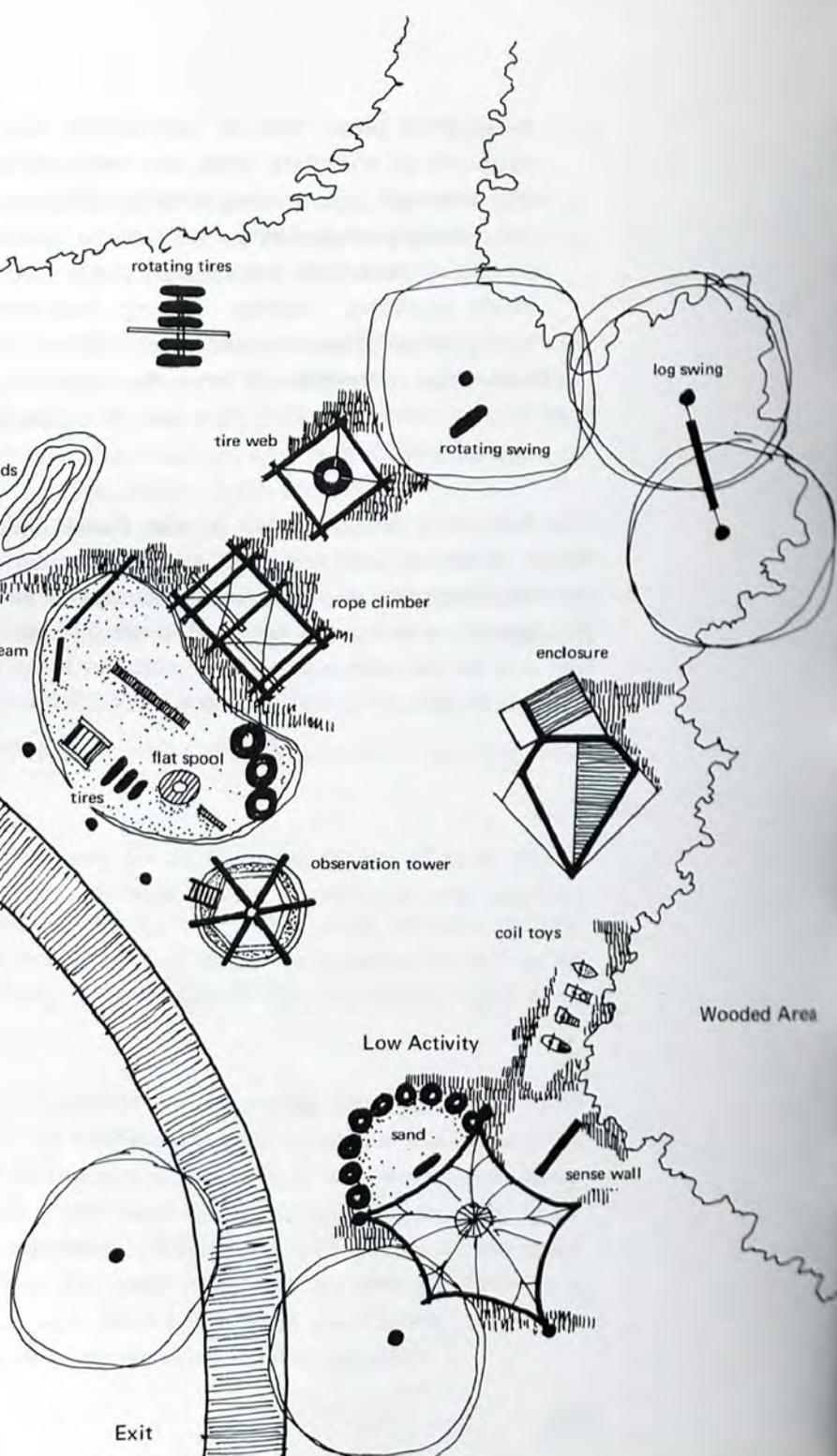
sense wall

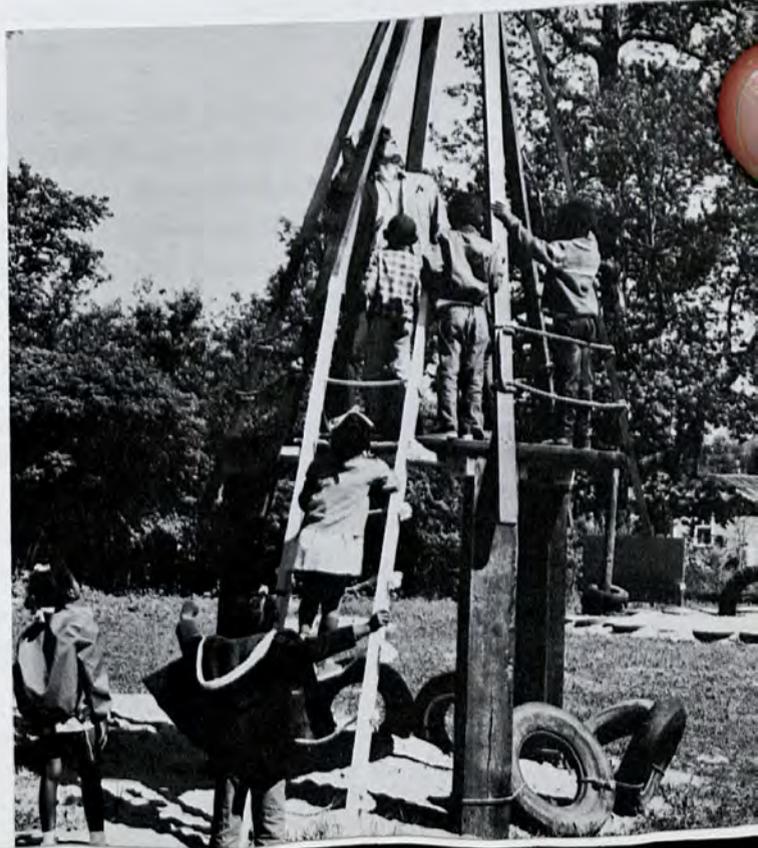
PLAYGROUND
ZEBULON PARENT-CHILD CENTER

Scale



Exit





EVALUATION CHART: ZEBULON PARENT CHILD CENTER PLAYGROUND

Activity	Area														
	open	observ. tower	enclosure	log swing	see-saw	run & balance	rotating swing	sand	dirt mounds	rotating tires	tire web	sense walls	coil toys	rope climber	
jump	+	+	+			+			+		+			+	
bend	+	+	+			+		+	+		+		+	+	
squat	+	+	+		+	+		+	+		+		+		
stretch	+	+	+	+	+	+	+	+	+	+	+			+	
pull	+		+	+	+		+	+	+	+			+	+	
push			+	+	+		+	+	+	+			+		
swing	+			+	+		+			+				+	
run	+		+			+			+						
climb	+	+	+	+	+		+	+	+	+	+			+	
balance	+	+	+	+	+	+	+	+	+	+	+		+	+	
carry	+	+	+					+							
lift	+	+	+					+							
throw	+														
roll	+								+						
sit	+	+	+	+	+			+					+		
crawl	+	+	+			+	+	+	+	+	+				
hear	+				+		+	+		+		+			
touch	+	+	+	+	+	+	+	+	+	+	+	+		+	
see	+	+	+	+	+		+	+	+	+	+	+	+	+	
dig		+						+	+						
social play	+	+	+	+	+	+		+	+	+	+			+	
solitary play	+	+	+	+		+	+	+	+	+	+	+	+	+	
courage	+	+		+	+	+	+		+	+	+			+	
fact learning	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
imagination	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
cooperation	+	+	+	+	+	+	+	+	+	+	+	+	+	+	

Community Representation in Participatory Design

David Alpaugh, Alan Billingsley, Gary Coates

Advocacy design, as defined by Davidoff, implies opposition of viewpoints in an adversary situation.¹ When that situation involves such clear cut adversaries as a government planning authority versus a well organized citizens' group, the advocate's role is relatively easy to define. When, however, the situation involves unorganized, poor, and frustrated black communities constrained by the different value orientations of a southern bureaucratic government, black communities develop widely disparate opinions concerning goals, strategies, and tactics, issues become confused and the would-be advocate encounters the difficulty of finding a representative of at least a plurality of the community's opinion.

When attempting to solve problems in poor black communities, it is of utmost importance for the advocate to make it known that his services are available, and then wait for the community to invite him to help. Once that contact is made, however, the definition of his role is subject to many considerations. Marshall Kaplan has stated that, contrary to being homogeneous, the black community is in reality many communities, and suggests that programs require a planning process directed clearly toward functional priorities, the participation of the community being sometimes more important than an accurate interpretation of the community's goals. To the community, plans based on ideologies are at best irrelevant, and contention and coalition are strategies, not ends. The "inside advocate" who links himself by choice to a constituency must be aware of the fact that he is not perceived by the community as a representative of their values in any way, but is merely a technical assistant by which that community might achieve its more central priorities; that it is the responsibility of the community to produce a normative definition of the advocate's role, and to define guidelines for both process and

product. His relationship to his constituency must be a legal, not paternal, one.² In black communities, white advocates should not conceive of their role as one which will organize the community toward the effort of developing a unitary design for the achievement of the goals of the entire community, as the complexity of the community prohibits such solidarity³, and because often those goals have not been articulated beyond a common hostility to the "outside". Clearly, some organization must already exist before the advocate can be effective. Lisa Peattie observes that to involve the neighborhood in some previously unrepresented interest, it must take the form of a small organizational beginning which, with time, an intent to broaden its base of operation, and a few successes to make participation seem rewarding, will pick up participants as it goes.⁴ The development of organization and working strategies becomes one of defining the role the advocate will play in the community's realization of their priorities. Once those provisions and guidelines are understood, the advocate then acts as technical consultant on a given problem and helps the community to understand the interrelationships of their specific problem with the peculiar technical problems involved and with the larger systems acting upon them.

South Park Child Development Center: A Case Study

In October of 1969, the CDG was contacted by a community organizer from a Southside, Raleigh Community Action Center about providing adequate child care in a community known as South Park. The South Park Community is bordered by Shaw University, a four lane major access route to downtown Raleigh, and a railroad spur and an industrial area. It has a population of low-income blacks with an annual income range of \$2000 to \$4000, a high percentage of mothers who either work or would like to, and more than 40 children between the ages of 3 and 5 who have no child care facility, or any safe recreation facility available to them in the community. The community organizer provided a contact in South Park who had led a small group of citizens in attempting to organize a child care center, and who had offered the use of a former store attached to her dwelling for such a center. The CDG contacted her and agreed to help the community as technical and program consultants.

The early attempts at developing a child care center had been thwarted primarily by a lack of organization in the community. The reasons suggested by the South

Park woman, however, were hostility and lack of cooperation on the part of various city agencies, and the unavailability of OEO and other federal day care funds. She wanted to avoid any further frustration in the community by keeping the developmental phases of the project relatively secret, encouraging and solidifying the community in the end with a final design presentation. Assuming that the citizens were organized and that they had other issues to deal with, the CDG representatives agreed to this strategy, believing that a viable program and a high visibility success was what the community needed. What was not realized at the time, however, was that the self-styled community leader had very poor communications with the citizens and no concept of a distribution of power, preferring instead to isolate all decisions and problems to herself under the well-intentioned guise of preventing frustration in the community.

Just how isolated her decision-making was did not reveal itself until later in the project. In the meantime, the CDG representatives and the community leader agreed that a child development program was needed before any design renovation could be considered, and that sources of funding should be identified and solicited. The major goals set forth for the program were:

1. To develop a child care program which attempts to normalize the intellectual and social development of the children through early social and environmental intervention and experiences which are cognitively stimulating.
2. To institute a program of family participation which encourages the development of the home environment and familial relationships.
3. To describe a building program which adequately houses the child development activities.

The first two goals developed into the need to:

1. Initiate a pre-school program and center in the community.
2. Initiate participation by parents in their child's development.
3. Develop a positive image and cultural identity about the child and his environment.
4. Develop capacities for appropriate and enduring relationships with people.
5. Develop language skills, problem solving and cognitive skills which will enable the child to handle effectively the regulation of his world at each developmental level.

A proposal for funding was drawn up and submitted to the Urban Crisis League of the Episcopal Church, and local industries were contacted. A tacit agreement was made that the designers from CDG would work with the appropriate city agencies on a design which satisfied state and local day care requirements and that the

community leader would act as community liaison and organizer of contributed building materials, labor, and funds. However, it soon became apparent that the community representative saw her role as more inclusive by acquiring some money, contracting a plumber, and having him rough in his lines without the knowledge of the designers and before any design schemes had been presented to her or the local building department. In spite of late attempts to clarify role relationships, no discernible progress could be made. A final design presentation was quickly prepared and submitted to a small group of South Park citizens in the community leader's home, a final list of funding sources was given to her, and the CDG withdrew from the project.

Prescribed Strategies For Advocate Involvement

The problems encountered in the South Park project might have been avoided had different strategies been used. It is likely that a frank discussion with the OEO community organizer when she first contacted the design group may have revealed some of the real reasons behind the earlier failures. Had that not disclosed anything useful, a cautious investigation of the community's priorities might have given some idea of the degree to which the child development center was a personal project of the community leader and the degree to which it was a centrally desired priority of the community. Once an accurate base of background information had been established, the process of defining roles should have been a deliberate set of recommendations by the group for potentially successful relationships, with the final decision and definition left to the community organization. A quasi-legal adherence to those agreements would then be considered binding, as opposed to the ambiguous understanding which actually followed. In short, procedures for initiating involvement with a community which has solicited help should be:

1. Establish a priority ranking of the specific projects in the community.
2. Ascertain the credibility of the representative in the community.
3. Investigate past attempts by the community to achieve the particular objective.
4. Establish a firm understanding of roles in the working relationship, with responsibilities clearly defined and agreed upon, with a signed agreement if possible.
5. Strictly adhere to those agreements.

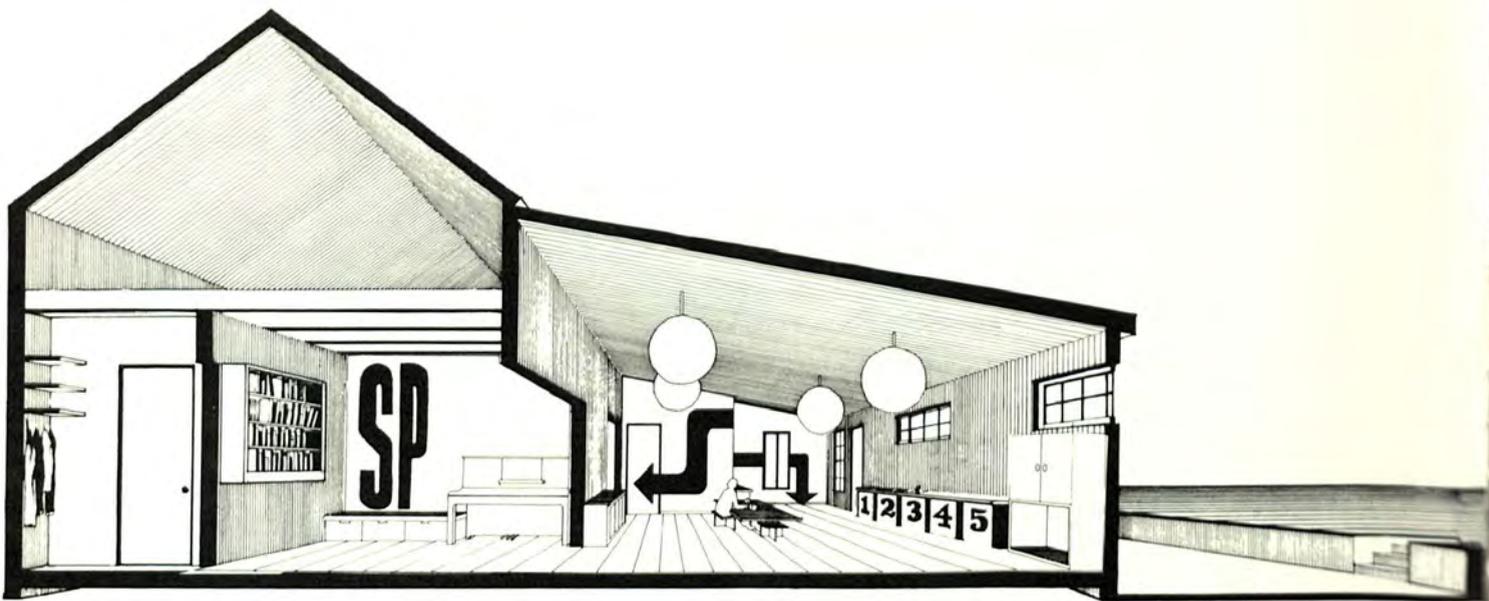
It now appears that the role which would have been most effective for the CDG in the South Park project would have been what Martin Rein has called the role of

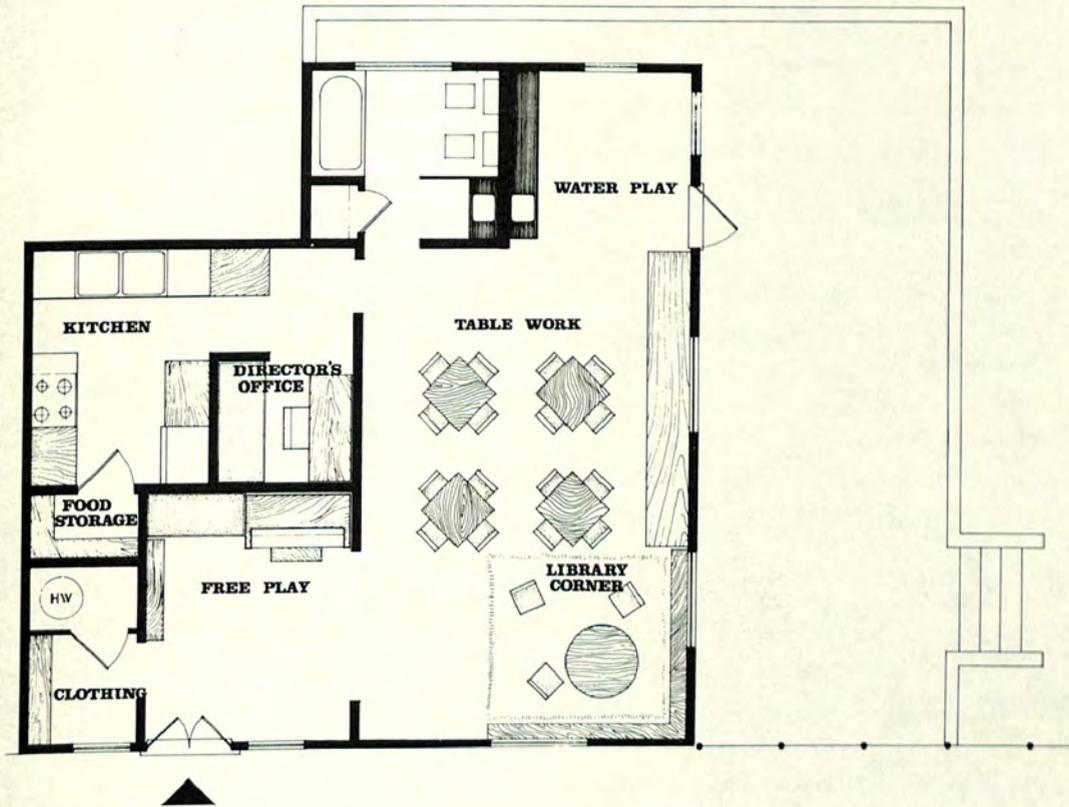
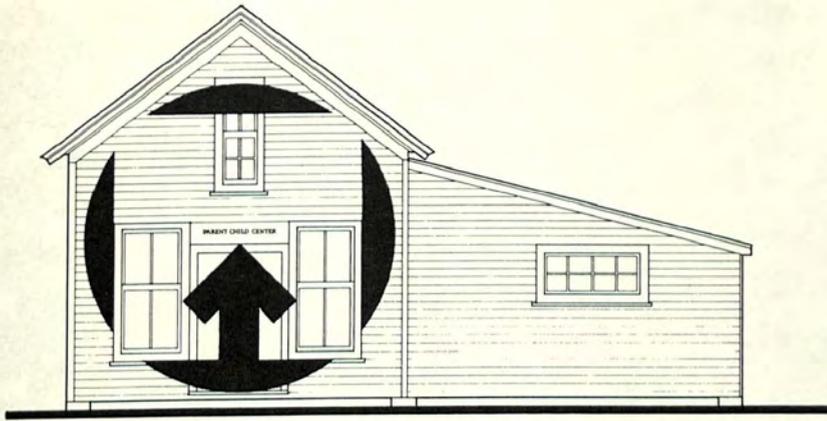
expertise⁵, although he criticizes that role as being one which has authority only to propose, not to achieve. Certainly achievement of the specific objective is the ultimate goal of any project, if only to provide a high visibility success for the encouragement of the community, but a positive self-image can best be advanced if the community has achieved that objective by itself. The community which lacks sophistication in problem-solving processes, however, needs above all an understanding of the strategies for achievement. The advocate, by adapting a value-orientation sympathetic to the community, and by taking advantage of his experience in dealing with problems, can best instruct his constituency toward the goal of self-improvement.

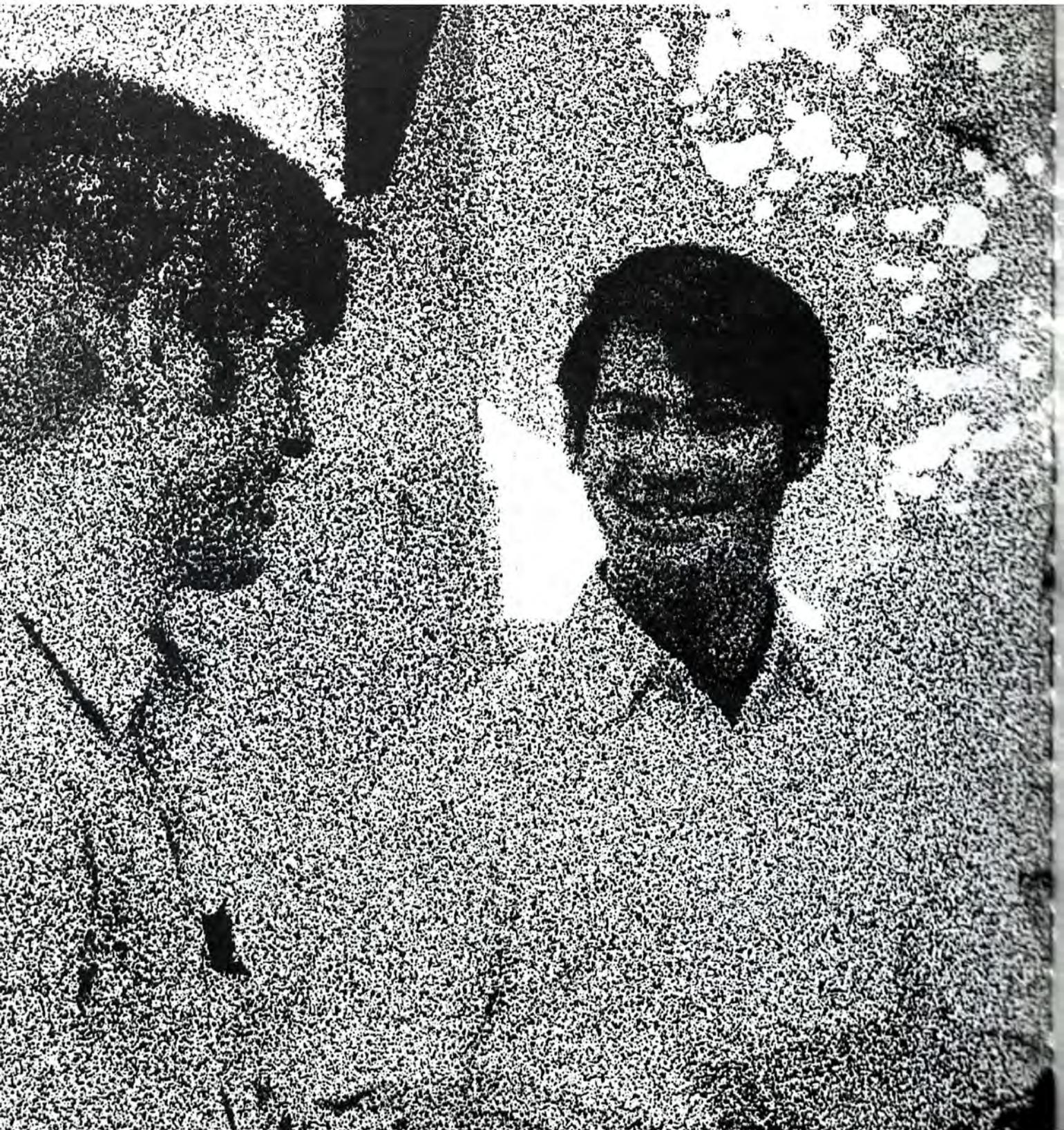
David Alpaugh

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Design Development of a Community Center

Mark Caraccia, John Vassiliades

Tuttle Community Center is a child day care and community facility located at 310 North Tarboro Road, Raleigh, North Carolina. Established in 1930, Tuttle has been serving the black families and organizations in east Raleigh for almost 40 years. As a day care facility involved in preschooling for black children, Tuttle accommodates 80-90 children daily with a total enrollment of 120 children. Children's ages range from 2-5 years in addition to accommodating school-aged children during the summer months. Monday through Friday the child begins his activities at 8:30 a. m. and the school day ends at 6:00 p. m. Tuttle has a staff of seven teachers and assistants, a dietitian and laundress, an executive director, Mary E. Carnage, and Assistant Director Mary W. Peebles. Tuttle has two major administrative bodies: the Board of Directors, and a Building Fund Committee, consisting of three Board of Director Members. Tuttle is the recipient of Federal Food Program funds and receives financial support from the United Fund. Children's fees¹ make up 60% of Tuttle's total yearly income with the remaining 40% from the United Fund and various money raising programs. In addition to child care services, Tuttle functions as a community center for community activities, ranging from teenage dances to a Public Health Clinic once a month.²

Tuttle Day Care Center was established in 1930 after the donation of a wood-framed, two-story house and lot. In 1966 to meet the increasing need for space due to greater enrollments, a concrete block addition was built around the north and east sides of the house. In 1968 Tuttle acquired the adjacent corner lot on the south side of the existing property. Two major problems faced the administrators of the center: first, the large child enrollment and community activities the Center wished to accommodate required much more space than physically existed at the Center.

Second, the two-story, wood-framed section of Tuttle Center was condemned by the City of Raleigh for inadequate plumbing and structure. This fact along with the space shortage led to the loss of Tuttle's state license as a day care facility.

In October of 1969 Mrs. Carnage, Director of Tuttle Day Care Center, contacted Henry Sanoff, Director of the Community Development Group (CDG) at North Carolina State's School of Design, and requested assistance for their building expansion program. Assigned to the project were two CDG members, John Vassiliades and Mark Caraccia to serve in the capacities of project programmers, designers, and consultants.

The Tuttle project consists of two phases: 1) a building to accommodate storage needs for the Center and housing for the Center's caretaker; 2) the destruction of the wood-framed structure to provide for two new classrooms and an auditorium. Three long-range goals were immediately apparent to the CDG members: 1) to fulfill Tuttle Center's space requirements to accommodate present and future needs; 2) to reestablish Tuttle Center as a State licensed day care facilities; 3) to provide the community with a well-designed and attractive facility to promote community pride and identification.

First Phase

The first addition was to meet storage and general use needs (records, files, play equipment, and linen area) as well as an efficiency apartment to house the Center's caretaker and wife. The budget was limited to \$15,000, a contribution by a personal friend of the director, and the floor space needed was estimated at 1,200 square feet.

In the planning and programming phase the CDG members worked closely with the Executive Director and the teaching staff to gather necessary information and clarify the Center's specific requirements.³ Through the use of schematic models, conceptual presentations, and discussion, additional needs and design strategies emerged. Some of these include:

- 1) A meeting space for various organizations in the area such as the Brownie and Cub Scouts, Golden Age Ladies Club, etc.
- 2) A space that would function as an indoor play space for children in inclement weather
- 3) A space that would accommodate school-aged children during the summer months.

After needs and space requirements were established, the CDG members began the design phase of the project. Within the economic limits, structural systems, mechanical systems, building materials considerations, plus physical and psychological needs of the users were studied and evaluated. To help in resolving all the design factors schematic models were again used. Aspects of physical form, interior space, space relationships, light, structure, ventilation and function were studied in scale-model form. As a second source of information, the structural and mechanical problems that emerged were presented to several professional consultants who acted as advisors to the CDG members.⁴

To provide for other present and future needs, it was decided to add to the storage area an inexpensive wood deck, the second level to be used for the record and file storage thus leaving the first level open and unobstructed for the indoor play space requirement. In the apartment area of the unit comfortable living areas within the limits of small square footages were accomplished by combining the two main living areas, the kitchen-dining area and living room, by using an exposed beam sloped ceiling, by providing efficient circulation patterns incorporated as parts of the living areas, and by utilizing a southern exposure for maximum sunlight.⁵

With the completion of the working drawings and approval by the Raleigh City Planning Department for construction, three Raleigh contracting firms were contacted by the CDG members and asked for construction bids. The three firms were:

- 1) Buffalo Construction Co.
- 2) Davidson and Jones Construction Co.
- 3) Inland Construction Co.

In a meeting with the Tuttle Center Building Fund Committee the two CDG members acted as advisors and interpreters of the submitted bids. The estimates were as follows:

- | | |
|-----------------------------|-----------|
| 1) Buffalo Construction Co. | \$ 15,685 |
| 2) Davidson and Jones | 21,000 |
| 3) Inland Construction Co. | 23,000 |

Buffalo Construction was given the construction contract by virtue of their low bid.

REFERENCES

- The children's fee schedule is on a sliding scale related to the family income of \$18-25 per week and charged \$3.50 per child per week for full day care; families with an income of \$175-200 per week are charged \$10 per child.
- The activities held at the community center are described in the table below:

	No. People Registered	No. Meetings	Total No. Attending
Nursery School	100	20	2,000
Day Care of School Age Children	20	20	400
Brownies (2 groups)	80	4	320
Garden Club	25	2	50
Senior Mothers	10	4	40
Teenagers	40	20	800
Parents' Clubs	40	4	160
Parents' Club	75	1	75
Playground - Informal	45	20	900
Conferences	50	20	1,000
Adult Neighborhood	35	2	70
Others Who Are Not Registered	70	4	280
Health Clinic	60	4	240
Programs, Teas, Practices, etc.	300	1	300
Young Adults	30	2	60
Friendship Club (Children from Broken Homes)	20	2	40
Two Neighborhood Church Groups (On Sunday at 6 p.m.)	90	4	360
	1,090	134	7,095

There are many teas, parties, meetings, etc., that are not in this schedule and more requests than can be filled.

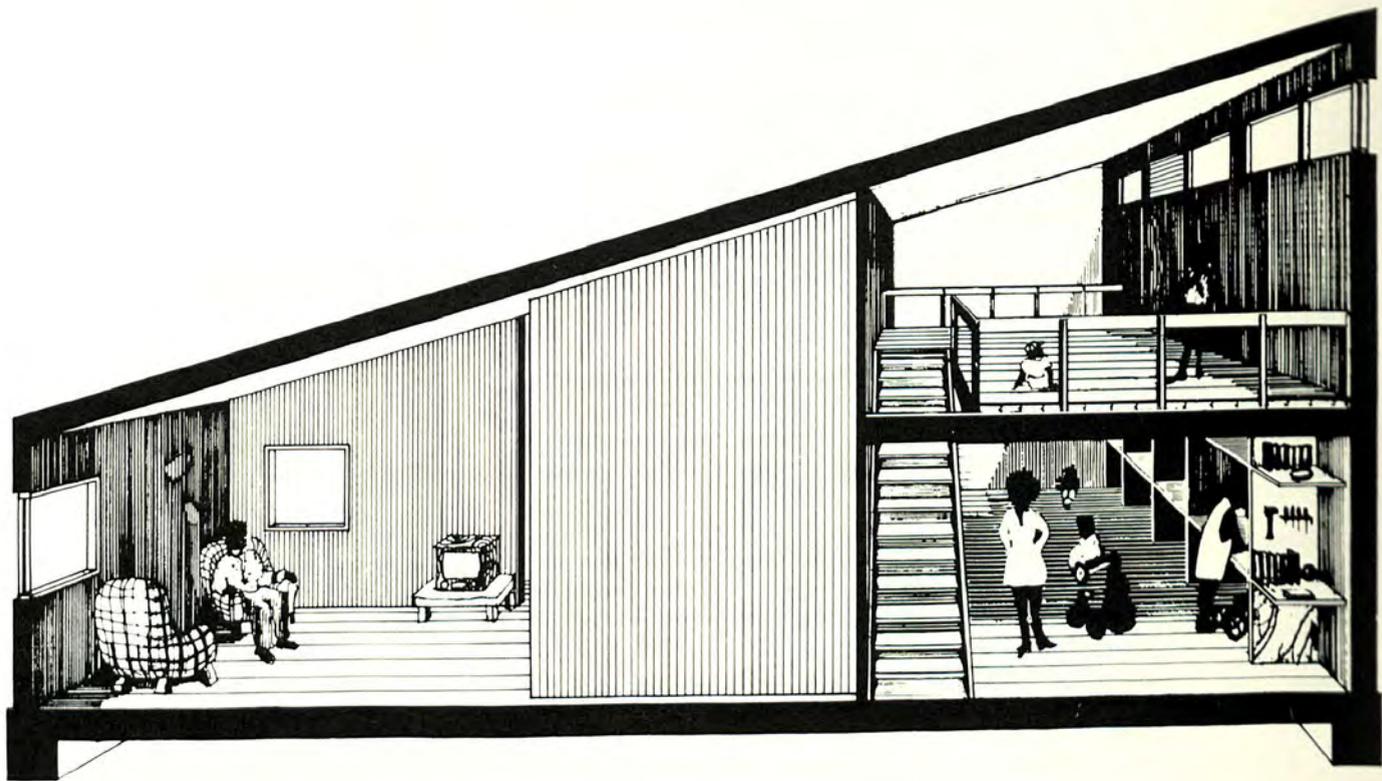
3. The spatial requirements for the building are described in the table below:

	Floor Area sq. ft.	Volume cu. ft.
Living Unit		
Kitchen-Dining Area	168	1344
Living Room	180	1800
Bedroom	140	1400
Walk-in Closet	36	288
Bathroom	45	360
TOTAL	569	5192
Storage Unit		
First Level: toy storage ,teaching supplies, play, linen area	532	
Second Level: files, records, long term storage	322	
TOTAL	854	10492
GRAND TOTAL	1423	15684
TOTAL COST	\$11.03	\$1.00

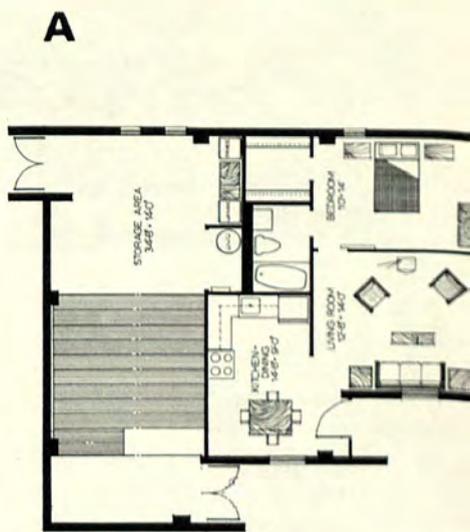
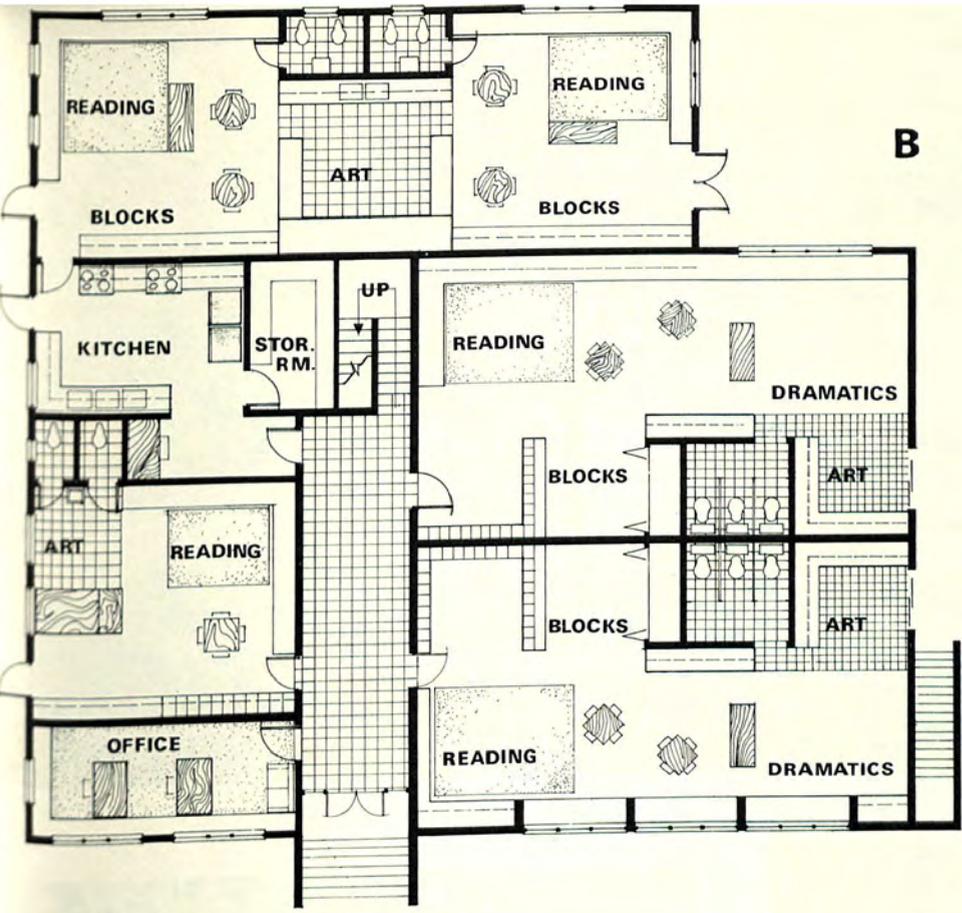
4. Professional consultants to the project were Donald Barnes, Mechanical, and David Hill, Structural.

5. The construction materials for the Center are included below:

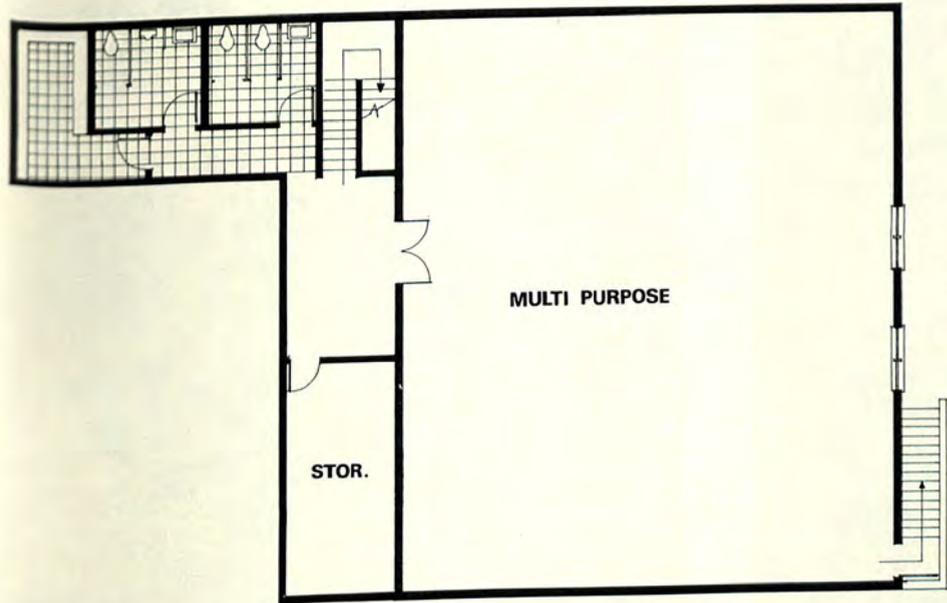
Foundation:	Reinforced concrete slab on grade
Exterior Walls:	8 in. thick masonry block with one coat of sealer and two coats of exterior grade paint.
Interior Walls:	
Living Unit:	Sheetrock on furring strips on the inside surface of the block walls; sheetrock on 2 x 4 wood framing for all interior partitions.
Storage Unit:	Exposed masonry block.
Ceiling:	
Living Unit:	Exposed wood beams in living and bedroom areas; sheetrock above kitchen and bathroom.
Storage Unit:	Exposed wood beams
Roofing:	Asphalt shingles on 2 in. structural insulation board supported by 2 x 10 wood members
Flooring:	Asbestos tile.



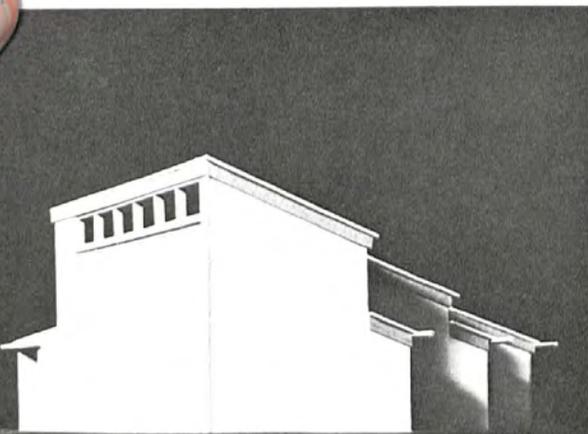
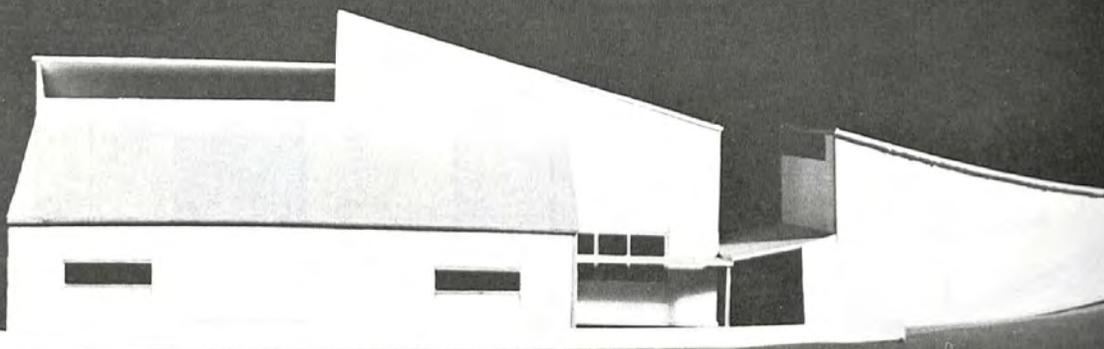
Section Through Stage A

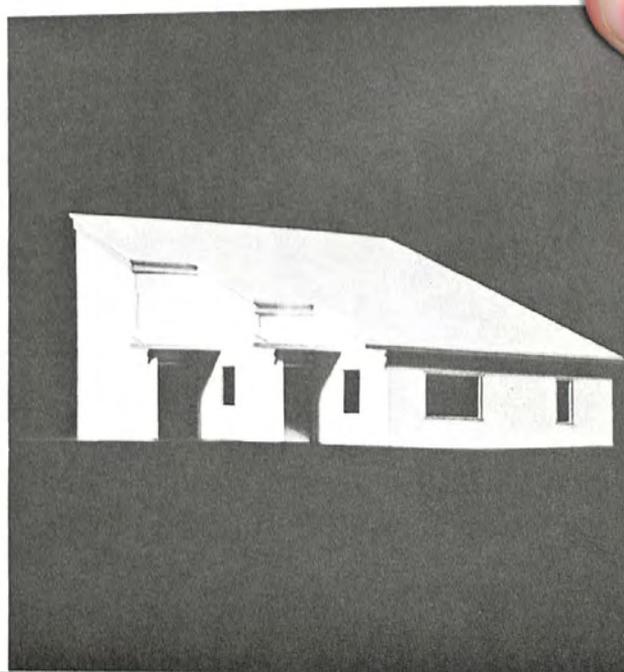
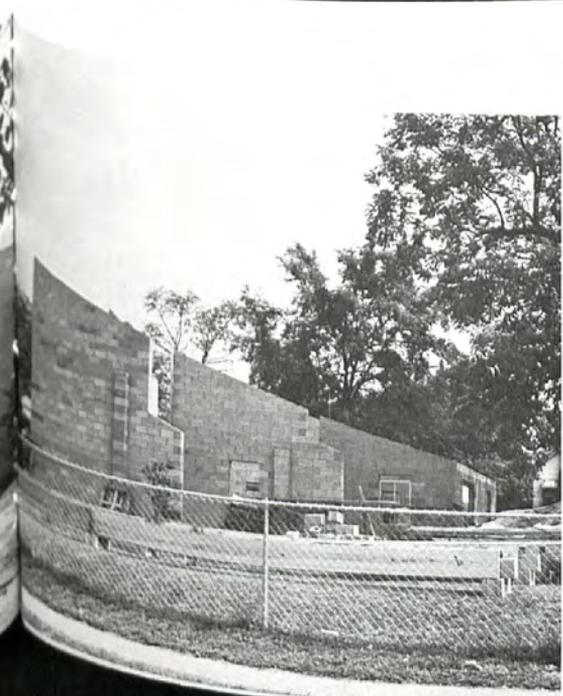
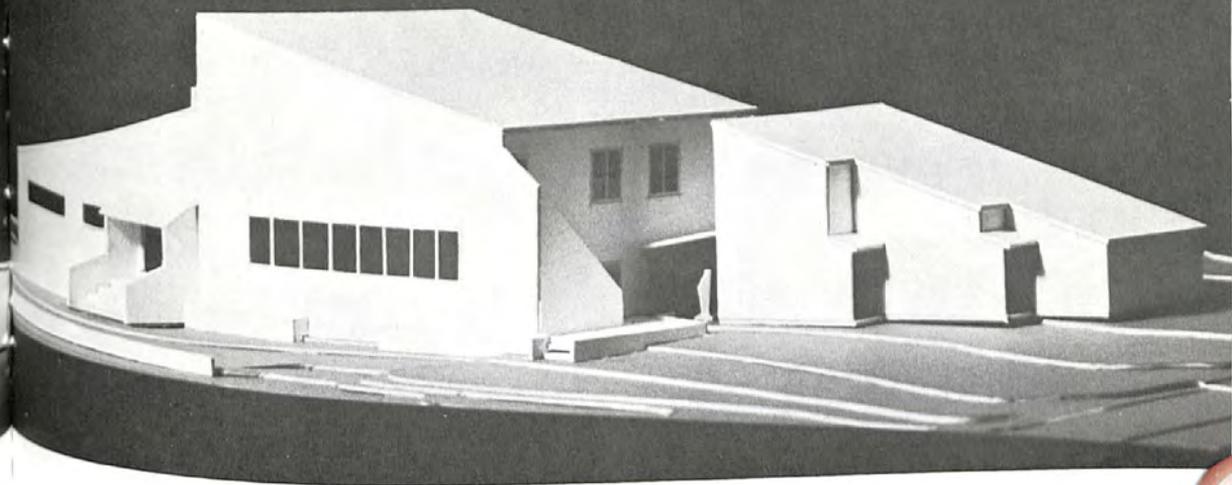


ENTRY



SECOND FLOOR







Craft Center, Boone

Gary Coates, Donald Cohen, Scott Heacock, John Sinnett

As a result of accelerating urbanization and technological change, it is becoming increasingly difficult for non-urban people to make a living by pursuing the skills of the past. This fact threatens to make extinct the craft culture of the descendants of the Scotch-Irish who settled the North Carolina Appalachians before the American Revolution. It is out of concern for the preservation of these skills that the Blue Ridge Hearthside Crafts Association was chartered by the State of North Carolina in August, 1968. This Association grew out of the Mountain Crafts program started by the (OEO) Community Action Agency serving Watauga, Avery, Mitchell, and Yancey counties. It is run by a Board of Directors chosen by the craftsmen from the four counties. Since the summer of 1965, the number of craftsmen involved has grown from 68 to over 450. As a result, many of the older craftsmen, whose arts were in danger of disappearing, have now passed their skills on to a new generation. By creating a market for the traditional crafts of the Appalachian people, the Blue Ridge Hearthside Crafts Association enables these people to earn incomes which might otherwise be unavailable to them.

The rapid growth and outstanding success of the Association has accentuated the need for a centralized facility to promote further growth. The present facility is dispersed and does not meet existing physical needs for inventory, training, or retailing. At present the Association has no permanent location for its regularly scheduled fairs. As a result of existing spatial limitations, planned growth is impossible to achieve. Furthermore, the lack of a permanent centralized facility loses a potentially vast market of vacationers and tourists who take the north-south route via the Blue Ridge Parkway. A year round Crafts facility would serve many of the existing and constantly emerging recreational and tourist activities in the Blue

Ridge Region, such as the booming ski industry. The future growth and effectiveness of the Blue Ridge Hearthside Crafts Association depends largely upon the construction of a Crafts Center in the Blue Ridge region.

The Community Development Group was contacted by the Blue Ridge Hearthside Crafts Association in January of 1970 to assist the Association in the preparation of a funding proposal for a Crafts Center. It was the role of CDG to conduct an exploratory study into the building needs of the Association and to present a preliminary design to accompany the funding proposal being developed by the Association.

Program Development

The initial effort of the members of the CDG was to determine the Association's perceived goals for the Crafts Center. These are identified as follows:

1. To provide a year round centralized facility for the many presently scattered operations of the Association.
2. To provide adequate space, with sufficient flexibility, to accommodate the many diverse existing and projected needs of the Association. Specifically, a Crafts Center should:
 - a. allow the Association to enlarge its warehouse inventory, thus allowing an increasing number of craftsmen to participate in the operation of the Association.
 - b. provide a larger centralized staff office facility, thus increasing the efficiency and comfort of the Association administration.
 - c. provide a year round retail outlet to allow an increase in crafts sales in the Blue Ridge region.
 - d. provide a larger and more efficient training facility to increase the numbers of craftsmen to be trained by the Association.
3. provide a permanent centralized facility for the four annual craftsmen's fairs sponsored by the Association. For many craftsmen, these fairs are the major source of income. As a result of the spatial limitations of the present policy of renting craft fair facilities, many craftsmen cannot participate in these fairs.

Following the statement of goals and objectives, the CDG and members of the Association arrived at a tentative program in terms of activity pattern statements which are summarized by activity pattern diagrams. Square footage requirements were derived from projected needs established by the Association.

Activity Pattern Statements

A. General Background Statements Affecting the Craft Center

1. Craftsmen do most of their work in their homes.
2. The Crafts Association offers members raw goods at wholesale costs and provides them with a year round retail market.
3. This year round outlet is provided by a Crafts Association retail shop and by contract-sale agreements with existing retail shops in other areas.
4. The major source of income occurs during craft fairs which are regularly scheduled four times a year. (Increasing numbers of traveling fairs are being scheduled.)
5. Training in craft skills continually occurs at the central inventory. Once a person is trained, he may return home to work in the tradition of his predecessors.

B. Retail Area

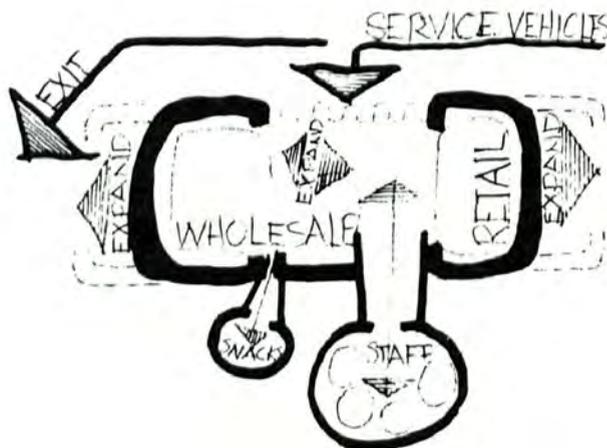
1. The retail area should be flexible in all directions. (Should allow for growth)
2. The many diverse products on exhibit need to be displayed in many different ways. (i.e. quilts need to be seen spread-out, ceramics need to be seen on shelves as well as hung, etc.)



3. Visitors should be exposed to the merchandise as frequently and from as many different vantage points as possible.
4. Exit from the Center should be through the retail area.
5. Retail inventory needs to be adjacent to the display area.
6. The retail area needs a materials supply area adjacent to it. (i.e. wrapping paper, bags, etc.)
7. The retail area needs constant natural lighting.
8. The retail area should invite visitors to enter by making the interior display visible to the outside.

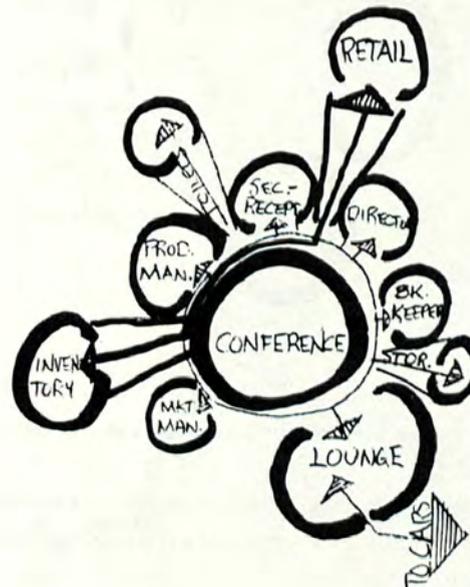
C. Warehouse Area

1. The warehouse area should be flexible in all directions (and it should allow for expansion).
2. Different types of storage arrangements are needed to accommodate the many different types of goods which are kept on inventory (including bulk fabrics, lumber, clay, leather, tools, etc.).
3. Retail goods are also stored here.
4. Delivery service should be provided for without interrupting other vehicular or pedestrian circulation.
5. The warehouse should be linked to the retail display area without passage through any public spaces.
6. The warehouse should be convenient to the staff area (especially convenient to the production manager and staff director).



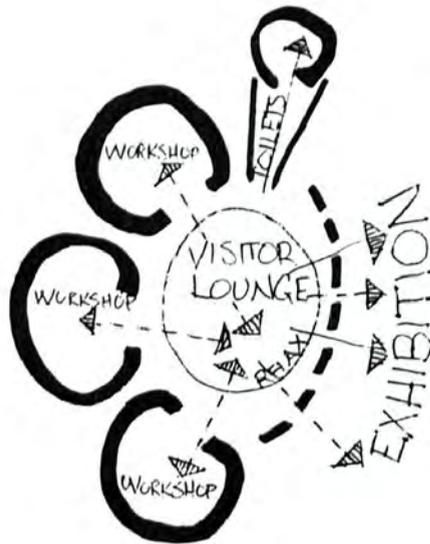
D. Staff Area

1. The production manager needs an office located close to the director's office and the warehouse inventory storage area.
2. The secretary-receptionist area should be adjacent to the director's office and near the production manager.
3. There needs to be a storage room convenient to this secretary-receptionist area.
4. There needs to be a conference room convenient to all of the staff. It should be large enough to accommodate at least 20 persons.
5. The staff should have a private rest area to serve its needs.
6. The staff needs a place to take breaks for relaxation and for informal discussions. This lounge area should be near the rest areas.
7. The market manager needs an office. It should be near to the conference area and the bookkeeper's office.
8. The bookkeeper's office should be adjacent to the secretary-receptionist and the market manager.
9. The staff area should be private from the rest of the center and it should be able to be entered by the staff independently from the other areas.
10. The staff area should be a link between the warehouse and the retail areas.



E. Training

1. To provide for a quality training program it is necessary to have several fully equipped permanent classroom-workshops. These classrooms should provide equipment for wood-working, weaving and sewing, ceramics, leather working, with space to add future areas such as lapidary, and so on.
2. Each classroom should be large enough to accommodate 8-10 craftsmen at work at one time.
3. Each classroom will be open to the public at fair times and will thus allow the visitor to observe the construction of the various products on display.
4. Thus, service and rest areas for the public should be convenient to the training area.
5. When the fairs are not in progress the training center will be open for training purposes.
6. The classroom-workshops should be a part of the exhibition area of the center.



F. Exhibition

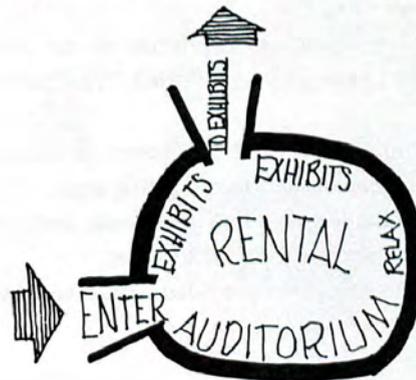
1. Many craftsmen derive their major source of income by displaying their products during the four major fairs.
2. Each craftsman needs a space in which to set up his own display booth.
3. The display booths should be so arranged as to maximize the exposure of each craftsman's products.
4. The visitors' needs for relaxed browsing should be accommodated in the exhibition areas.

5. Exhibition display space should be both indoors and outdoors.
6. Exhibition space should be large enough and flexible enough to accommodate increased numbers of craftsmen.
7. The exhibition display space should encourage the individual arrangement of individual display booths.
8. The exhibition display space should be integrally linked to all other functions of the center and should, in general, encourage visitors to see all of the display booths.



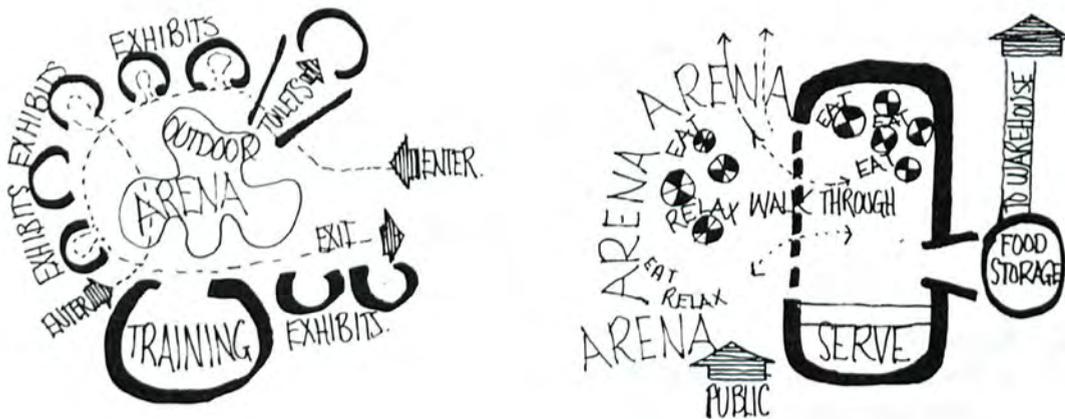
G. Multi-purpose

1. The multi-purpose space should provide sufficient flexibility to meet projected as well as unforeseen needs.
2. Projected needs include craftsmen display booths during regularly scheduled fairs and expansion space for future classroom-workshops.
3. This space should be able to operate as a rented auditorium serving the local community when it is not in use by the Association. Thus, this space should be able to be closed off from the rest of the center, with its own private entrance and exits.



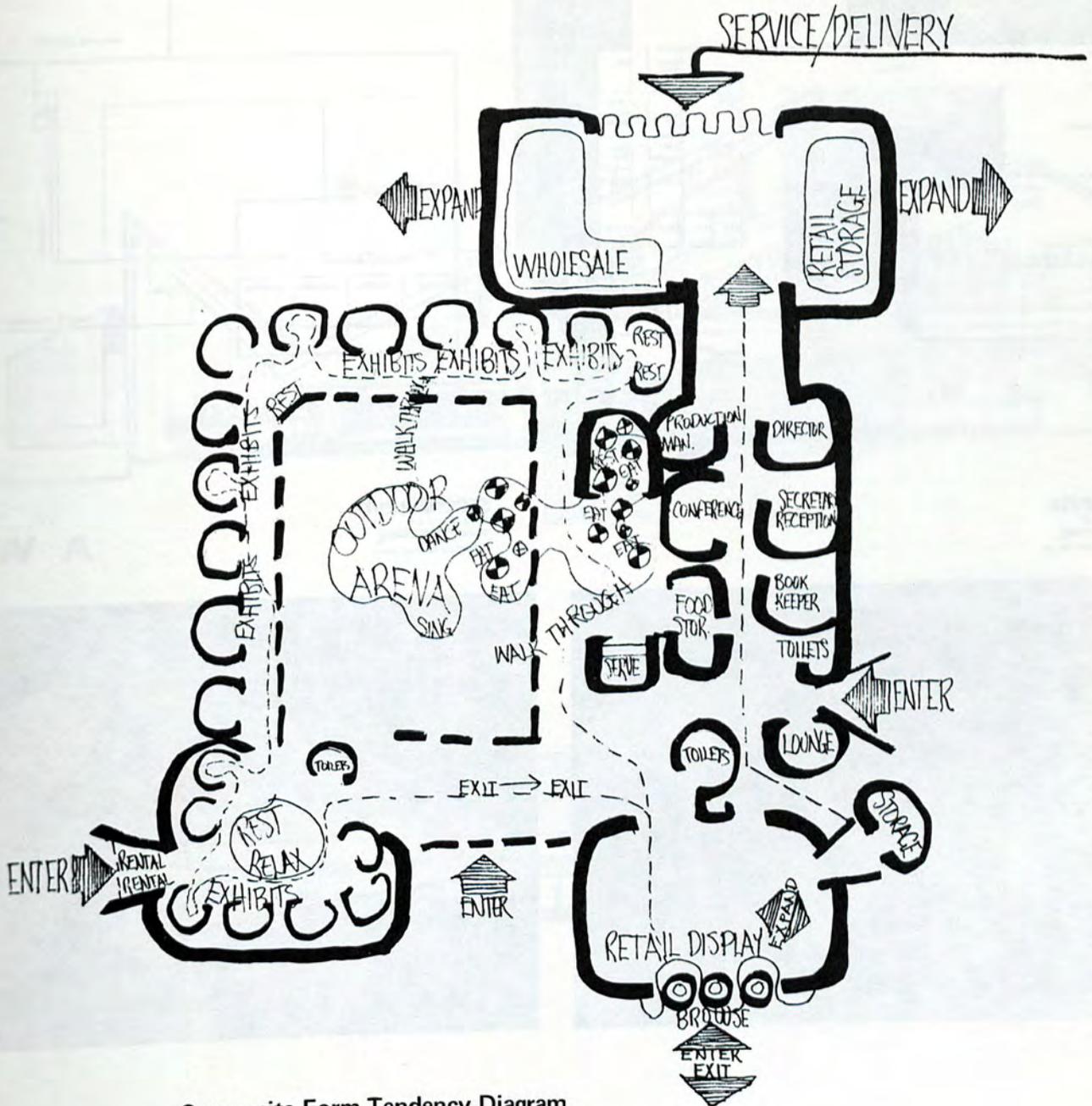
H. Outdoor Arena

1. The outdoor arena should be the focus of the crafts fair activities, providing opportunities for such activities as music and dancing, outdoor eating, outdoor exhibition booths, and so on.
2. The outdoor arena should encourage a feeling of spontaneity and openness, especially during craft fairs.
3. All spaces open to the public should have visual access to the activities taking place in the arena.

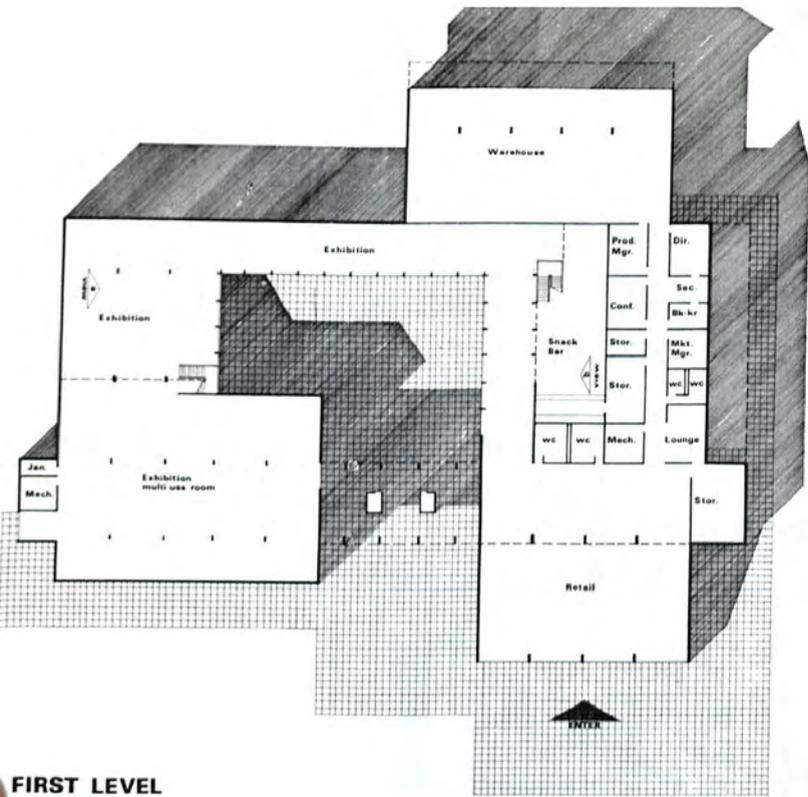


I. Public Service Facilities

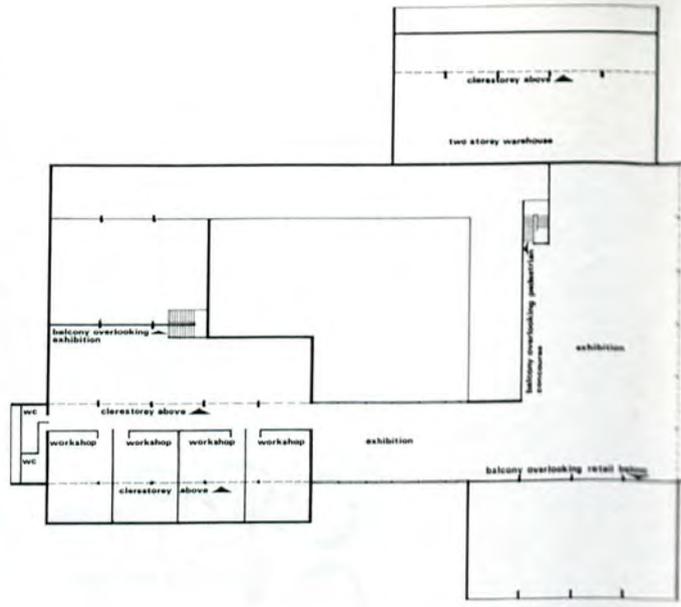
1. All spaces open to the public should be provided with adequate rest room facilities.
2. Tool storage and utility connections should be provided for small snack stands which will be set up during the craft fairs.
3. There should be an adequate space for visitors to eat adjacent to the snack counters.
4. The eating space should be out of the main circulation paths yet should have visual access to the outdoor arena.
5. In good weather, it should be possible for visitors to eat and relax in the outdoor arena.
6. Public rest rooms should be adjacent to the eating areas.
7. Public telephones, mechanical vending machines, and drinking fountains should be conveniently located throughout the Crafts Center.
8. Adequate public parking should be provided within easy walking distance of the Center.



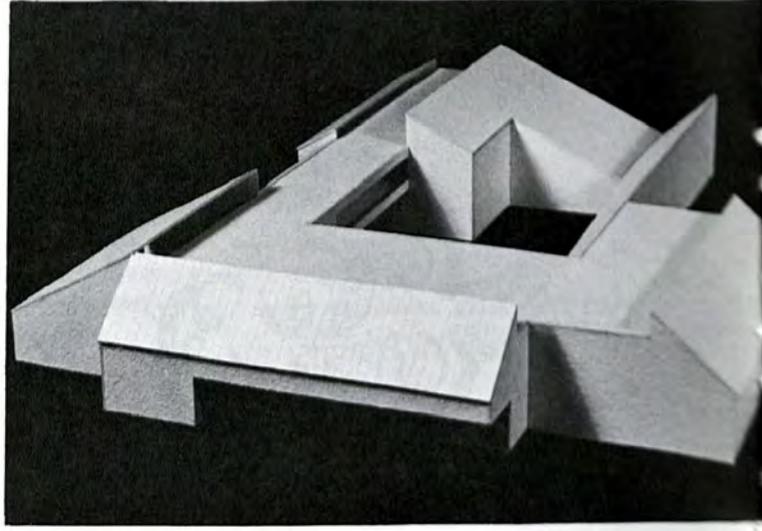
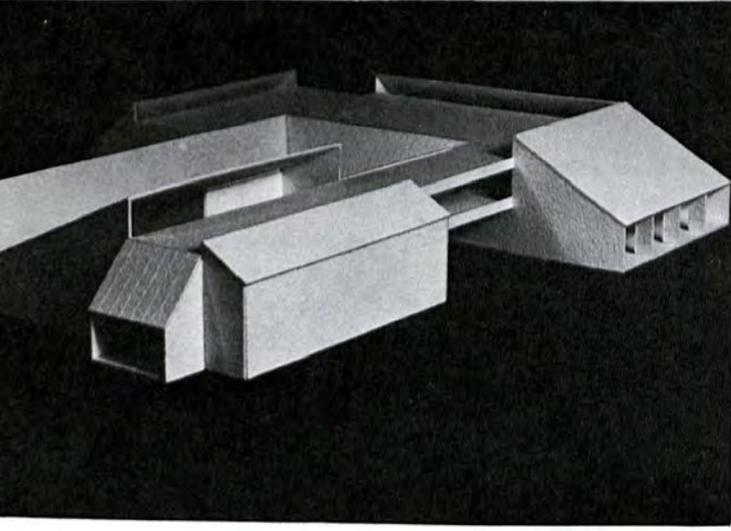
Composite Form Tendency Diagram



FIRST LEVEL
 SCALE 1/16" = 1'-0"
 FIRST FLOOR 30,700 SQ. FT.

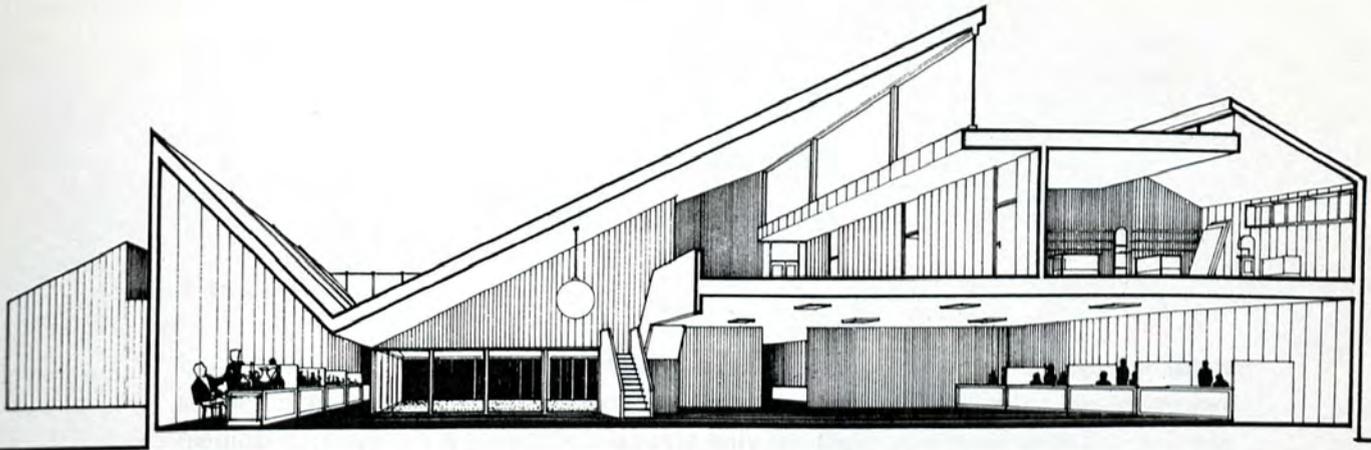


SECOND LEVEL
 SCALE 1/32" = 1'-0"
 SECOND LEVEL 18,600 SQ. FT.

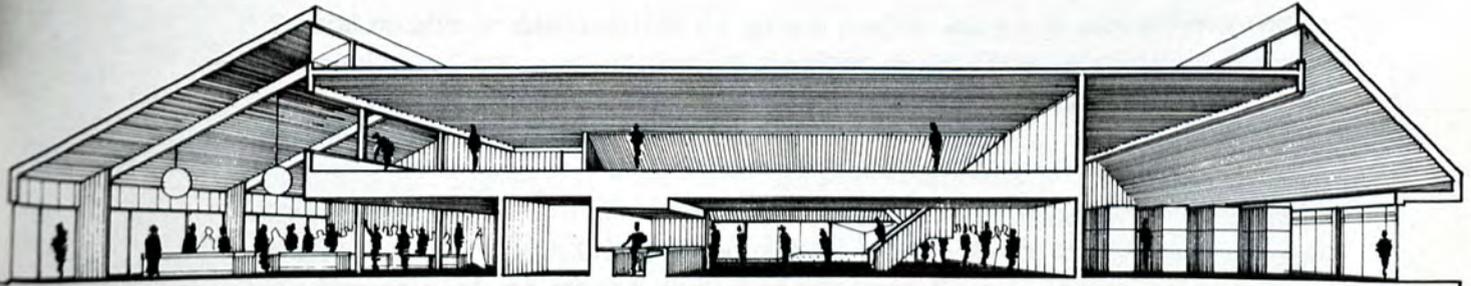


Public House & Community Planning

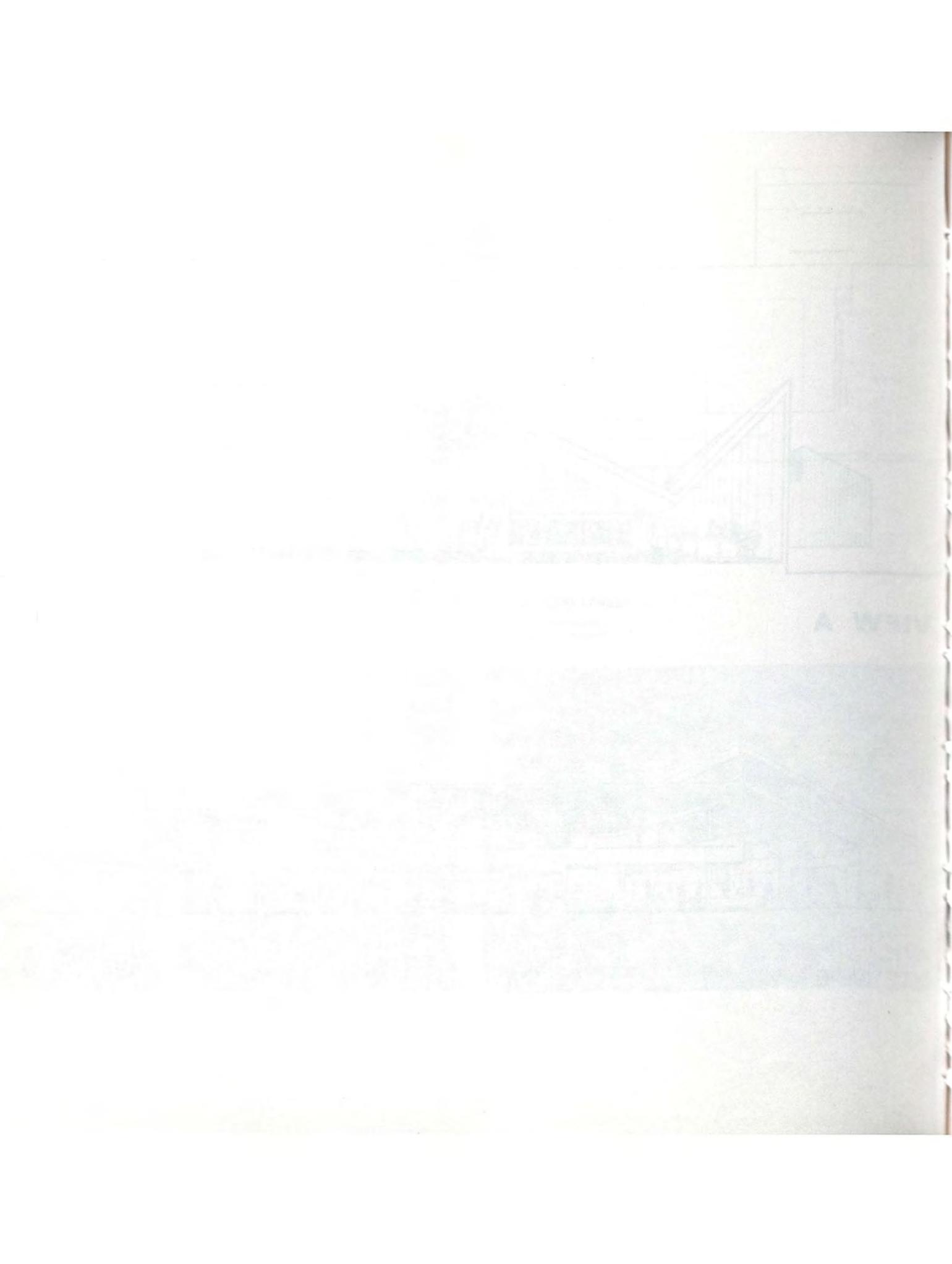
View from the street



VIEW A



VIEW B



Health Care Facilities Planning

Terry Alford, John Valley, C.T. Jackson

Introduction

Lack of adequate health and medical care has become a serious problem for many segments of the population—especially the rural poor. The present fee-for-service medical care system is generally adequate only for those who have both the mobility and means to pay for rendered services. However, those segments of the population that have the greatest need are also those least able to afford the majority of existing services. These groups are usually characterized by below average income, substandard living conditions, large family units, low mobility, and poor diet. In rural areas these difficulties are further complicated by distance and the resultant lack of effective communications.

Several notable problems within the general medical and health care delivery system of rural areas are: specialization of physician skills; little coordination between services, agencies, and both private and public programs; and the sparse distribution, or non-existence, of medical facilities.

One partial solution to the problems outlined above is illustrated by the group practice at the Tarboro Clinic, Tarboro, N.C. The physicians in this clinic represent the sum total of the medical skills in Edgecombe County. The physicians are the staff at the County Hospital and the County Public Health Service. As a result, they are able to coordinate services, more effectively use their varied skills and specialities, and provide follow-up services for the patients in their care.

While the geographical centralization of facilities is an effective tool in health care delivery at that locale, it does not solve the problems that arise from the distances that a patient must travel to receive care. Distance and mobility problems also help to create secondary problems of equal importance. The most obvious difficulty is emergency care. Also, the lack of community oriented facilities and services may serve to alienate prospective patients, preventing them from seeking help until their condition has become critical. In addition there is no guarantee that a patient treated once will return for the necessary follow-up services if that patient has to travel an inordinate distance. Finally, the remoteness of the clinic may prevent the staff from ever correcting some of the conditions that contribute to a patient's poor health.

The concept of a Basic Care Unit, as an extension of the group practice, may help diminish some of these problems. Operating as satellites of the Tarboro Clinic, the Basic Care Units would be smaller, community-oriented facilities providing medical and general health care at a local level. They would provide health screening and evaluation, immunization and vaccination, medical treatment and health education services, and related social services. Combined in one unit, and acting as an administrative entity, social, medical, and related services can be coordinated to deal effectively with the individual patient; the central clinic could provide the necessary back-up with specialized services and treatment.

The Basic Care Unit would be staffed by physicians from the clinic. Two physicians might be responsible for one unit, which they would visit on alternating days. In addition to the physicians, medical students from area medical schools would provide additional services, and specialists would visit the unit on a scheduled basis. The general staff of the facility would be headed by a full time registered nurse. Practical nurses, clinical assistants, technicians, as well as the social services staff would vary with the locale and the exact nature of the services provided for that community. Additional help, paid or volunteer, would be sought in the community.

Assuming that the concept of the Basic Care Unit is valid, and could be a means of attacking the problems outlined above, the following project had two major goals:

1. To develop a design program consisting of a set of design requirements for a prototypical basic care unit.
2. To use the program to design a prototypical Basic Care Unit.

To achieve these goals the following eight objectives were set. The definition and analysis referred to in the first five objectives was conducted in terms of participants, equipment, activity dependency, privacy, and general performance requirements.

1. Define and analyze those activities necessary to provide basic medical treatment services.
2. Define and analyze those activities necessary to provide health screening and preventative medical services.
3. Define and analyze those activities necessary to provide individual and group health education services.
4. Define and analyze those activities necessary to provide social services (as they pertain to health).
5. Define and analyze the secondary activities needed to support the above listed services.
6. Combine the defined activities to form spatial activity sets, and write performance requirements for each spatial set.
7. Describe the relationships between the spatial set, list them, and group the sets into an overall facility spatial set.
8. Design a Basic Care Unit attempting to satisfy each requirement.

The program is presented in three parts. One, a list of general facility requirements including site considerations, orientation, entrance requirements, etc. Two, a list of the primary spatial sets and their functions. Three, a detailed description of each spatial set including its participants, the activities accommodated in that set, the performance requirements for that set, and a diagram representing that set.

The program is not presented as a collection of proven and true statements. Nor is it intended to establish rigid guidelines. Rather, its purpose is to: one, provide a tool to aid in the design of Basic Care facilities by providing a list of conditions that should be satisfied, and, two, provide a checklist for evaluation of the finished facility (and evaluating and correcting the program).

The application of the program to the design of a facility is presented here in the form of a renovation of an unused building in the town of Whitakers in Edgecombe County. The old building is located close to the center of the small business district of Whitakers. It was felt that the renovation of an existing building in a small community would illustrate the usage of the program and also help demonstrate its flexibility. In addition, the renovation might help to establish the facility as a community facility.

Terry Alford
John Valley

For additional information on Primary Spatial Sets 2 (Reception) and 3 (General Patient Interview and Consultation) see *A Pattern Language Which Generates Multi-Service Centers* by Christopher Alexander, Sara Ishikawa, and Murray Silverstein. Berkeley: Berkeley Graphic Arts, 1968. For additional information on Primary Spatial Set 6 (Health Screening and Testing Sequence) see *Relocatable Multiphasic Health Screening* by the Research and Graduate Center, School of Architecture, Texas A&M University, available through the Health Services Research and Federal Health Programs Service, 3100 Wyman Park Drive, Baltimore, Maryland.

Special gratitude is given to Dr. Lawrence M. Cutchin, M.D., of the School of Medicine, U.N.C., Chapel Hill, and the Tarboro Clinic, Tarboro, N.C., for his initial interest and continued support of our effort.

General Facility Requirements

1. The facility shall be placed in the business center of the community in the proximity of both pedestrian and vehicular intersections. (A corner site is preferable.)
2. The public main entrance shall be distinctly recognizable to both pedestrian and vehicular traffic.
3. The public entrance shall also be both visible and accessible from the public parking area.
4. The public entrance shall be screened or covered to provide weather protection.
5. Either extended from, or adjacent to, the main entrance, there shall be an outdoor covered area.
6. A sign shall be placed at the public entrance stating the name of the facility and its hours, as well as the staff names and telephone numbers of persons to contact when the unit is closed.
7. At the public main entrance there shall also be a bulletin board for public information displays and facility news.
8. There shall be an emergency entrance leading directly to the General Medical Treatment Area. If there is no emergency receptionist, an intercom bell system to the Nurses Area must be provided at this entrance.
9. This emergency entrance shall be clearly marked, and have sufficient weather protection to cover vehicles driven to the door.
10. The emergency entrance shall have a sign indicating persons and telephone numbers of persons to contact when the unit is closed.
11. A public telephone shall be provided at the emergency entrance that may also serve as an intercom in requirement eight above.
12. A staff entrance separated from the main public entrance shall be provided. It may double as the emergency entrance.
13. The General Long Term Waiting Area shall be visible from the sidewalk and the main public entrance.
14. There shall be cut-off points between the main areas of the facility (i.e. locking doors) which will permit the closure of a portion or portions alone.
15. All areas designated for prolonged occupation shall have windows whenever feasible.
16. Separate activity areas shall be clustered around a central space rather than arranged along a corridor. When corridors are unavoidable they shall be kept to a minimum length.
17. In public areas, fixed furniture shall be avoided when possible.
18. Steps shall be avoided in areas frequented by the old or crippled.

PRIMARY SPATIAL SETS

1. General Long Term Waiting

The General Long Term Waiting area shall be the major public space in the facility. It shall be a high activity area accommodating more user oriented activities than the usual reading of dog-eared copies of magazines. The major functions of the space will be twofold. First by accommodating as wide a range of patient waiting diversions as possible, it will hopefully make the usually dreary task of waiting more enjoyable. Besides providing for patient usage, it shall also accommodate the patient's family, friends of the patient, non-patients, and individuals present for business activities. The second major function is to help establish the facility as a community facility by emphasizing the display of community interest information, and by being an open public lounge and meeting place.

2. Reception

Reception shall be the major control point for access to the rest of the facility. It is here that appointments will be made, patient records retrieved or initiated, and return appointments arranged. The patient's file is also returned to this area by the patient on his way out of the facility.

The rationale for the reception platform described in the requirements is to attempt to help overcome the tendency of some receptionists to hide from the patient behind a counter and not deal with a patient until it is at their convenience. It is hoped that by placing the receptionist at the patient's eye-level, the receptionist will accommodate the patient as quickly as possible.

3. General Patient Interview and Consultation

This area shall be used by the staff of the facility in recording personal patient information and for counselling the patient about his particular problem. It is necessary that the patient be as relaxed as the circumstances will permit for this activity, hence the requirements that will enhance a sense of private informality. It is also hoped that the booth-type of arrangement will contribute to a type of "neutrality" for the space and not the feeling that the patient is a guest in the private domain of a particular staff member. The space shall accommodate not only the patient and interviewer, but also the patient-associate (wife, mother, husband, etc.).

4. Short Term Waiting

The primary function of the Short Term Waiting Area shall be to provide a space for the patient to use between medical activities and prior to leaving the facility (for example, after the screening and testing sequence, but before seeing the doctor). The patient shall never remain in the short term waiting area for more than a few minutes, and the space functions more as a "rest stop" than a general waiting area.

5. Nurse's Area

The primary function of the Nurse's Area shall be one of control and patient presentation. It is to this area that the patient is referred by the receptionist or medical historian. The patient presents to the nurse (describes why he is there and/or what his symptomatic problems are). The nurse then directs the patient to an examination and treatment room (after recording anthropometric and symptom data) or initiates the screening and testing sequence.

The other major function of the Nurse's Area shall be to provide a semi-private space in which the nurse can consult with and advise the patient about his problem or discuss and explain the results of the various tests with the patient.

Finally it is to the Nurse's Area that the patient shall report after seeing the doctor to receive prescribed medication as part of his treatment therapy.

6. Health Screening and Testing Sequence

The Health Screening and Testing Sequence Area shall be a collection of private and semi-private spaces in which the various testing procedures shall be conducted. Its primary function is to accommodate those activities necessary to form a composite picture of the general health of a patient and to indicate any possible physiological problems with the patient. The area shall accommodate not only testing activities but also ancillary activities such as recording the results in the patient's record, dressing for the patient, laboratory procedures and procuring urine specimens. This area must be visually and acoustically separate from all other activity areas in the facility.

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7 General Medical Treatment

The General Medical Treatment shall be the space in which the majority of treatment activities shall occur (minor surgery, injections, etc.). It shall also be the area in which the nurse shall dispense limited treatment for cuts, etc. It shall serve as an emergency treatment room for automobile accidents and heart attacks, etc. General Medical Treatment Area shall also serve as an examination room for certain testing activities in which an examination table is necessary.

8. Physician's Consultation and Research

The Physician's Consultation and Research Area shall accommodate several activities. First, it shall accommodate physician-patient discussion and consultation, in a private and informal manner (see General Patient Interview and Consultation). Secondly, it shall serve as a reference and resource area for the physician. Finally, it shall accommodate limited staff socializing (before and after hours and lunch). This area shall not be the private domain or "office" of the physician, but rather the space he may use when he is in the facility.

9. Physician's Examination and Treatment

The primary function of the Physician's Examination and Treatment Area is to enclose the activity of examining the patient in an acoustically and visually private envelope.

10. Health Education and Group Conferences

The Health Education and Group Conference area shall serve two functions. First, it shall accommodate health classes (birth control, hygiene, diet education, pre- and post-natal care) conducted in the facility as part of a general program of health education. Second, it shall accommodate all conferences and meetings held by the staff, community groups, or any other group that uses the facility.

11. Records Keeping and Storage

Records Keeping and Storage shall be the area in which all patient records, histories and billing information are kept. In addition, all written information pertinent to the operation of the facility shall be stored in this area.

Primary Spatial Sets

1. General Long Term Waiting

Participants:

- Patient,
- Patient Associate,
- Non-patient and business,

Related and Included Activities:

- Socializing and Lounging,
- Child Play,
- Reading,
- Public Water Closet and Lavatory Using,
- T.V. Viewing,
- Public Information and Community Interest Displays,
- Watching Outside Activities,
- Watching Inside Activities,
- Public Telephoning,
- Coffee and Snacking,

Primary Access and Linkage Requirements:

1. "Reception" shall be visible from General Long Term waiting,
2. General Long Term Waiting shall have physical access to "General Patient Interview and Consultation" Areas,
3. Access to public lavatory shall be visible from General Long Term Waiting,
4. Public lavatories shall be physically accessible from General Long Term Waiting,
5. Entrance shall be visible from waiting area,
6. Nurse's Area shall be visible and accessible from General Long Term Waiting,
7. Reception area shall be within speaking distance of General Long Term Waiting,

Primary Interior Set Requirements:

1. Exterior shall be visible from waiting area,
2. Child play shall be incorporated into, or visually controllable from General Long Term Waiting,



1. General Long Term Waiting
See key to diagrams, page 209

3. Primary seating arrangements should be socio-petal,
4. Limited socio-fugal seating arrangements should be available,
5. Seats shall not be fixed,
6. Seats shall have visual access to at least one of the following inside activities:
 - a. Enter-Leave facility
 - b. Enter-Leave from General Patient Interview and Consultation Area
 - c. Approach and Departure from Reception Area
 - d. Public Information and Interest Displays
7. An area shall be available for coffee and snacks,
8. General Long Term Waiting shall accommodate T.V., games, card-playing, and other waiting diversions,
9. Tack boards shall be available for public use (lost and found and "For Sale" items),
10. A public telephone shall be available in General Long Term Waiting,

2. Reception

Participants:

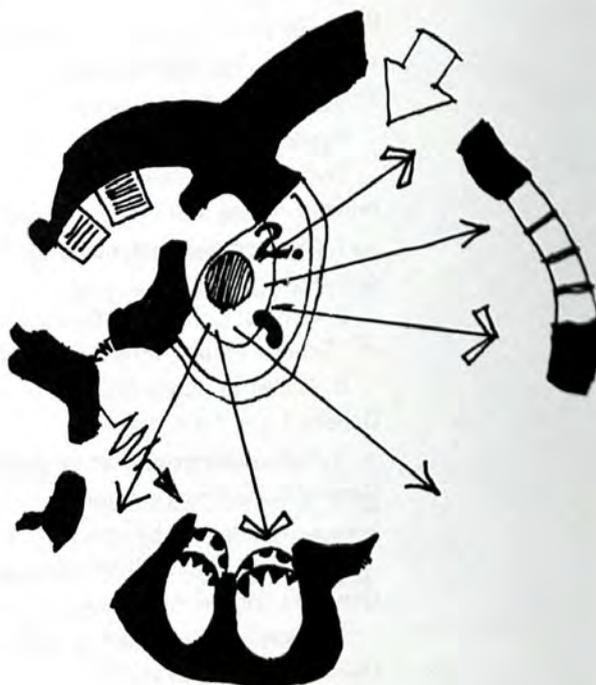
- Receptionist,
- User or patient,

Related and Included Activities:

- Patient reporting in and record retrieval,
- Directing patient to appropriate area,
- Calling for patient from waiting area,
- Return appointment scheduling,
- Initial appointment scheduling,
- Scheduling appointment by telephone,
- General Administrative Tasks,

Primary Access and Linkage Requirements:

1. Reception shall have visual access to entrance,
2. Reception shall have audial access to General Long Term Waiting Area,



2. Reception

3. Reception shall have staff communication links with
 - a. General Patient Interview and Consultation Area
 - b. Nurses' Area
 - c. Physician's Consultation and Interview
 - d. Records Keeping
 - e. Bookkeeping and Billing
4. Reception shall have visual control over access to public water closet and lavatories,
5. Reception shall have visual control over child play (if child play is part of General Long Term Waiting Area),
6. Reception shall have visual control over access to interior of building,

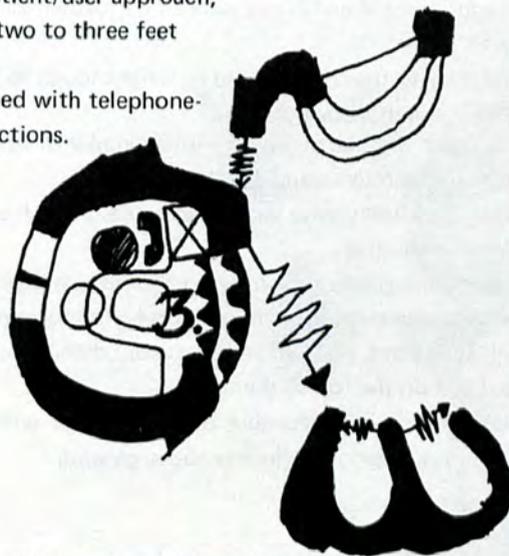
Primary Interior Set Requirements:

1. The receptionist sits on a platform twenty inches above floor level,
2. On one or two sides of the platform there is a counter or desk two feet above the platform and forty-four inches above the floor,
3. One surface of the counter or desk is approximately eighteen inches wide and functions as a counter facing patient/user approach,
4. The second surface of the counter/desk is two to three feet wide, and serves as a typing desk,
5. The reception counter/desk shall be provided with telephone-intercom that has both inside and outside connections.

3. General Patient Interview and Consultation

Participants:

- Medical Historian,
 Patient/User,
 Visiting Staff
- a. Psychologist,
 - b. Psychiatrist,
 - c. Welfare Case Worker,
 - d. Family Counselor,



3. Interview and Consultation

Related and Included Activities:

Recording Medical History,
Recording Demographic Data,
Recording Pertinent Financial Information,
Advising and Counseling by any provided Health and
Social Services.

Primary Access and Linkage Requirements:

1. General Patient Interview and Consultation shall have access to and from the General Long Term Waiting Area.
2. General Patient Interview and Consultation shall have access to Short Term Waiting,
3. General Patient Interview and Consultation shall have communication link with reception area,
4. General Patient Interview and Consultation shall have access to Nurses' Area.

Primary Interior Set Requirements:

1. Visual and Audial Privacy must be maintained,
2. To help create a confidential atmosphere, the room shall have a low ceiling and a carpeted floor,
3. The interviewer and client shall sit no further than five feet apart,
4. The door to the room should be large enough to allow two to enter almost simultaneously,
5. The room shall be provided with a circular or roughly square table no more than three-and-a-half feet across.
6. Client and interviewer shall sit at angles to each other, not across from each other,
7. A continuous sofa type of wrap around seat is preferred to chairs which shall enclose a table on three sides forming a booth,
8. All equipment, phones, and files, etc., shall be stored close at hand, but not on the top of the table,
9. Natural lighting is desirable, but windows or openings shall extend no lower than forty inches above ground.

4. Short Term Waiting

Participants:

Patient

Related and Included Activities:

Reading, Watching Inside Activity,
Limited Patient to Patient Socializing

Primary Access and Linkage Requirements:

1. Short Term Waiting shall be physically and visually accessible from Nurse's Area.
2. Short Term Waiting shall have access to Health Screening and Testing Sequence.
3. Short Term Waiting shall have access to Physician's Consultation and Research.
4. Short Term Waiting shall have access to Public Lavatories.
5. Short Term Waiting shall have access to General Patient Interview and Consultation.

Primary Interior Set Requirements:

1. Short Term Waiting shall be provided with chairs, not benches, for patient use.
2. Short Term Waiting shall be provided with reading material for patient usage.
3. Short Term Waiting shall be provided with displays of public interest information.

5. Nurse's Area

Participants:

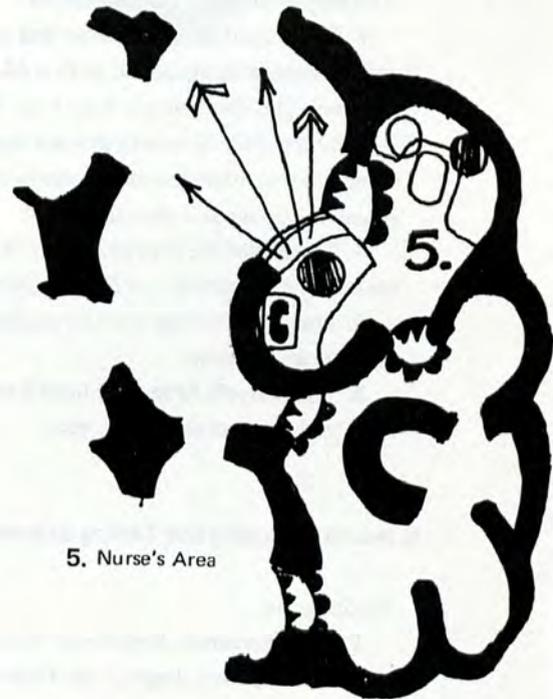
Patient, Registered Nurse, Clinical
Assistant or Practical Nurse

Related and Included Activities:

Patient Presentation and Complaint,
Registered Nurse-Patient Instruction
Explanation, Initiation of Testing
Sequence, Anthropometrics



4. Short Term Waiting



5. Nurse's Area

Primary Access and Linkage Requirements:

1. Nurse's Area shall have access to Evaluation and Testing Sequence.
2. Nurse's Area shall have access to General Treatment Area
3. Nurse's Area shall have access to Short Term Waiting Area.
4. Nurse's Area shall have audial and visual control over Short Term Waiting.
5. Nurse's Area shall serve as a control point for access to medical service areas.
6. Nurse's Area shall have access to Physician's Examination and Treatment.
7. Nurse's Area shall have access to Physician Consultation and Research.
8. Nurse's Area shall have access (physical or communications) to Records Storage.

Primary Interior Set Requirements:

1. There shall be a reception and patient presentation area equipped with a 44 inch high counter that separates the Nurse's Area from Short Term Waiting.
2. There shall be a semi-private area for patient-nurse interview and consultation with direct access to the nurse's reception area.
3. There shall be provision for anthropometric measurements within the Nurse's Area.
4. The Nurse's Area shall be equipped with a telephone/intercom.
5. The Nurse's Area shall have a table for note taking, records review, etc.

6. Health Screening and Testing Sequence

Participants:

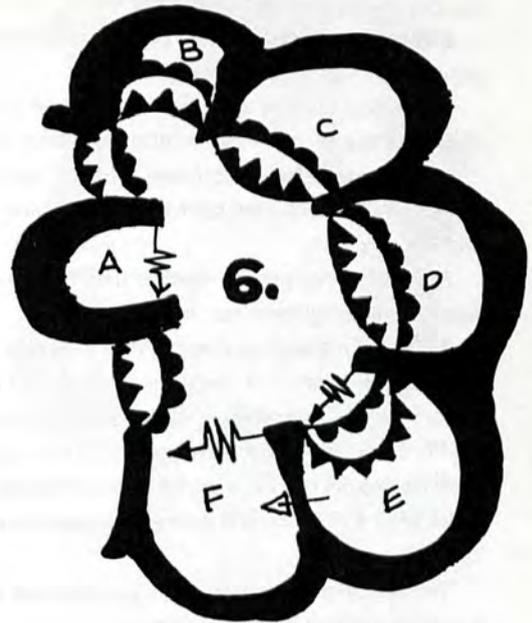
Patient Screenee, Registered Nurse, Clinical Assistant, Radiologist, Lab Technician

Related and Included Activities:

Medical History Taking, Anthropometrics, Audio/Visual Testing, EKG, Blood Pressure, Pulse, Spirometry, Chest X-Ray, Skin Fold, Achilleometry, Urine Specimen, Pap Smear, Blood Sample, Immunization, Dressing, Laboratory Analysis.

Primary Access and Linkage Requirements:

1. Evaluation and Testing Sequence shall be accessible from Nurse's Area.
2. Evaluation and Testing Sequence shall have access to General Patient Consultation and Interview (for medical history taking).
3. Evaluation and Testing Sequence shall have access to General Medical Treatment.
4. Screening and Testing Sequence shall have access to Short Term Waiting.
5. Screening and Testing Sequence shall have access to Physician Consultation and Research.
6. Screening and Testing Sequence shall have access to Physician Examination and Treatment Area.
7. Screening and Testing shall have access (physical or communications) to patient records storage.



6. Testing Sequence

Primary Interior Set Requirements:

1. Screening and Testing Sequence shall be audially and visually private from all other activities in the facility.
2. Screening and Testing activities shall be spatially arranged in a sequential manner.
3. Screening and Testing activities shall be grouped according to ease of test administration, equipment sizes and similarities, similarities of individual tests and privacy requirements of individual tests.
4. Testing sequence shall be spatially arranged so as to have the patient dressing area at beginning and end of the sequence.

5. All testing areas shall have controllable light sources giving accurate skin color.
6. The laboratory shall be part of, or immediately adjacent to the testing sequence.
7. Medical History taking shall be taken in the General Patient Interview and Consultation Area.
8. There shall be at least two dressing booths in the dressing area provided with waste cans, gown hampers and mirrors.
9. Lockers for patient clothes shall be provided near the dressing booths.
10. Audio/Visual testing shall be provided with vision tester (or chart), tonometer, table and chair for testor, stools for screenees, and storage cabinets.
11. EKG, Blood Pressure and Pulse testing shall be provided with a couch or examination table, table with EKG machine and blood pressure monitor, chair and writing surface.
12. Spirometry testing shall be provided with a spirometer and a writing surface.
13. A darkroom or film developing machine shall be provided appropriately shielded from, or out of the path of X-Rays.
14. Shielded storage for films and plates shall be provided in or near X-Ray area.
15. Achilleometry shall be provided with a chair, pressure tolerance set, achilles reflex meter, percussion hammer and writing surface. (Achilleometry may be performed in the General Medical treatment area.)
16. Urine specimens shall be obtained in a lavatory adjacent to the laboratory (pass through compartment between lab and lavatory is desirable).
17. The laboratory shall be equipped with blood analyzer, blood count unit, microscope, centrifuge, refrigerator, stover, sinks, clock/timer, storage and counter work surface.
18. Pap smear requires examination table accessible from three sides, adjustable examination light, sink, work counter and storage (may be performed in General Medical Treatment Area).

7. General Medical Treatment

Participants:

Patient, Registered Nurse aids, Practical Nurse, Physician

Related and Included Activities:

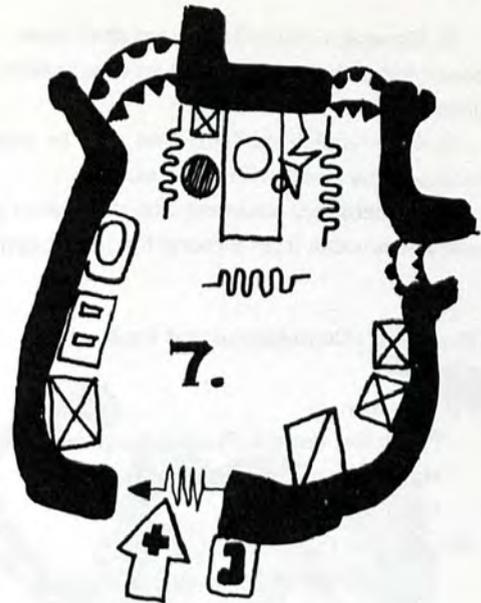
First Aid, Minor Surgery, Prescribed Drug Administration, Injection and Vaccinations, Equipment and Drug Storage, Washing and Sterilization, Various Testing Activities

Primary Access and Linkage Requirements:

1. General Medical Treatment shall be accessible from Nurse's Area.
2. General Medical Treatment shall be accessible from Screening and Testing Sequence.
3. General Medical Treatment shall be accessible from Physician Examination and Treatment.
4. General Medical Treatment shall be easily accessible from emergency entrance.

Interior Set Requirements:

1. Skin fold, achilleometry, pap smear, blood sample and immunization activities of Screening and Testing Sequence. May take place in General Medical Treatment Area.
2. General Medical Treatment shall be visually and audially private.
3. General Medical Treatment shall be provided with an examination and treatment table accessible from at least three sides.
4. General Medical Treatment shall have movable screens.
5. General Medical Treatment shall be provided with a sink and sterilization equipment.
6. General Medical Treatment shall be provided with lockable dry storage for drugs and equipment.
7. General Medical Treatment shall be provided with a refrigerator for serums and perishable drugs.



7. General Medical Treatment

8. General Medical Treatment shall have controllable light sources and an examination light that gives accurate skin color.

9. General Medical Treatment shall be provided with counter and writing surface.

10. Emergency equipment (oxygen, etc.) should be easily accessible from General Medical Treatment Area.

8. Physician's Consultation and Research

Participants:

Physician, Patient, Patient Associate, Non-Patient, Other Staff Members or Visiting Specialists

Related and Included Activities:

Physician-patient and patient-associate consultation and instruction, physician-staff consultation, physician-non-patient consultation, business, etc., limited staff socializing, physician research

Primary Access and Linkage Requirements:

1. Physician consultation and research shall be accessible from General Medical Treatment Area.
2. Physician consultation and research shall be accessible from short term waiting.
3. Physician consultation and research shall be accessible from physician examination and treatment area.
4. Physician consultation and research shall be accessible from nurse's area.

Primary Interior Set Requirements:

1. Physician consultation and research shall be provided with a writing/work surface.
2. Physician consultation and research shall have a booth arrangement for physician-patient consultation (see general medical interview and consultation requirements).
3. Physician consultation and research shall have storage space for resource materials and medical information.



8. Physician's Consultation and Research

4. Physician consultation and research shall have natural lighting and an exterior view.

5. Physician consultation and research shall have a telephone/intercom.

6. Physician consultation and research shall be audially and visually private.

9. Physician's Examination and Treatment

Participants:

Physician, Registered Nurse or other medical assistants, Patient

Related and Included Activities:

Examination, Patient Dressing, Washing, Advising, Consulting, Prescribing, Additions to Written History

Primary Access and Linkage Requirements:

1. Physician Examination and Treatment shall be accessible from short term waiting.

2. Physician Examination and Treatment shall be accessible from physician consultation and research.

3. Physician Examination and Treatment shall be accessible from nurse's area.

4. Physician Examination and Treatment shall be accessible from general medical treatment area.

5. Physician Examination and Treatment shall be accessible from screening and testing sequence.

Primary Interior Set Requirements:

1. Physician Examination and Treatment shall be visually and audially private.

2. Physician Examination and Treatment shall have a couch or table open on at least two adjacent sides for patient examination.

3. Physician Examination and Treatment shall have a hand sink.



9. Physician's Examination and Treatment

4. Physician Examination and Treatment shall have storage for examination equipment (tongue depressors, etc.)

5. Physician Examination and Treatment shall have a writing surface.

6. Physician Examination and Treatment shall have a chair for physician or patient associate.

7. Physician Examination and Treatment shall have a controllable light source giving accurate skin color.

8. The examination and treatment couch should be oriented so that when the patient is lying on the couch, his head is toward the door and the physician may examine the patient from the patient's right side.

10. Records Keeping and Storage

Participants:

Secretary, Receptionist

Related and Included Activities:

Records Storage and Retrieval,
Billing

Primary Access and Linkage Requirements:

1. Records Keeping shall be accessible or have communications link with receptionist.

2. Records Keeping shall be accessible or have communications link with Nurse's Area.

3. Records Keeping shall have communications link with physician consultation and interview.

4. The individual patient record travels with the patient or screenee through the facility.

Primary Interior Set Requirements:

1. Records Storage shall be equipped with cabinets, or trays for the storage of patient data.

2. There shall be a work surface or desk for secretarial use, typing table, chair, intercom and telephone, tabulator, and trash can.



10. Records

11. Health Education / Group Conference

Participants:

Patients, Staff, Community Groups

Related and Included Activities:

Group Conference, Hygiene, Pre-Natal,
Birth Control and Dietary Classes,
Community-Staff Discussions

Primary Access and Linkage Requirements:

1. Health Education/Group Conference (HEGC) shall be accessible from General Waiting.
2. HEGC shall be accessible from entrance with visual control of access by reception area.
3. HEGC shall have access to public lavatories.
4. HEGC shall have access to snack area.

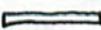
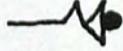
Interior Set Requirements:

1. HEGC shall have movable seats.
2. HEGC shall have movable tables.
3. HEGC shall have storage for audio-visual equipment, books, etc.
4. HEGC shall have tackboards and blackboards.



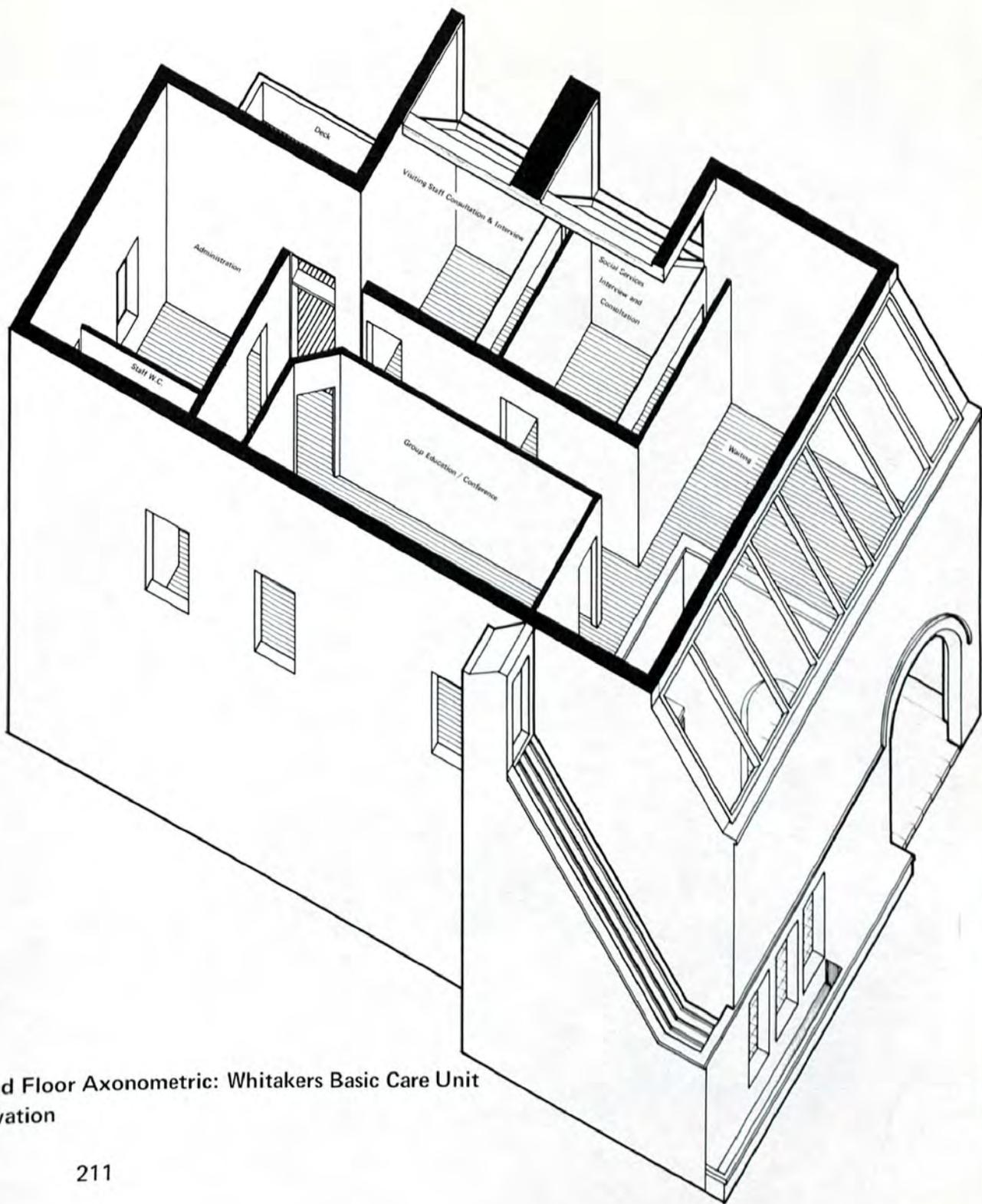
11. Health Education / Group Conference

KEY TO DIAGRAMS

	Public Entrance		Storage
	Visual Control / Access		Refrigerator
	Acoustical Control / Access		Tackboard
	Visual Privacy		Window
	Acoustical Privacy		Snack Area
	Physical Access		Desk
	High Activity		Screen
	Sociopetal Seating		Lockable Barrier
	Sociofugal Seating		Sink
	Patient		Sterilization Equipment
	Staff		Reading
	Intercom / telephone		Waiting Diversions
	Emergency Entrance		File Storage
	Booth		Child Play
	E & T Table		Adjustable Examination Light
			Conference / Class
			Pass-through in Wall



First Floor Axonometric: Whitakers Basic Care Unit Renovation



Second Floor Axonometric: Whitakers Basic Care Unit Renovation



Neighborhood Development for Soul City

Douglas Bennett, Alan Billingsley, Linda Jewell, Robert Lauricella

Warren County, along with other counties in Eastern North Carolina and Southern Virginia, suffers from both acute unemployment and underemployment, especially among a predominantly black population with a chronic manpower drain to the larger urban areas of the North: Richmond, Washington, Baltimore, and New York. Many of these emigrants settle in the Northern Black ghettos and become a part of the urban poverty cycle with little opportunity for improvement.

Floyd McKissick Enterprises wanted to offer an alternative to the Northern migration by building a new town in the South where both poor blacks and whites could learn useful skills and become full franchised members of society. The proposed new town, Soul City, is to be located north of Henderson, N.C., in Warren County and is accessible to both Interstate 85 and the main line of the Seaboard Coastline Railroad. The developer has acquired 1800 acres of land with plans to acquire a total of about 5,000 acres or more for a projected population of 50,000 for Soul City before the year 2000.

McKissick Enterprises' claim was that Soul City would be "primarily concerned with the social environment and growth opportunities of people."¹ Thus the overall goal of the project team² was for the creation of a new viable urban community in the context of contemporary American society which equalizes maximum opportunity for individual development. From this statement two problems were posed: first, how can a city, as a social and physical environment, best support individual maintenance and development? Second, how can social institutions and physical environments be designed with maximum potential for adaptive change over time?

Individual growth is very largely the product of experience. By limiting experience, personal development is constrained.

The perceptual and behavioral options available to the individual should be as diverse as possible. Exposure to diverse people and ways of life will result in a broader awareness of the different life styles in our culture and could result in a tolerance of these differences.³

The awareness of alternative ways of life could also provide behavioral models for upwardly mobile individuals.⁴ To permit a broad range of experiences and exposure to other people and life styles would imply a complete mixing of people according to social, economic, life stage, and life style preferences.⁵

To promote a broad mixing of socio-economic status and life stages it was proposed to organize residential units into a sub-community which is described as a residential unit.⁶ This would consist of a population of around 2,000 which was considered by the team to be an average for the maximum number of people an individual would be able to recognize on a face-to-face basis and perceive as comprising a sub-community. As in the traditional "residential unit" concept, the focus of the sub-community would include small shops, an educational center for the younger children and other related service facilities that would be needed by its diverse population. It was felt that the service component of the sub-community or residential unit would become extremely important, serving the needs of particularly the very young or old and economically disadvantaged new arrivals.

With the goal of establishing a heterogeneous population base at the sub-community level, the next scale of the problem involved defining a residential population base. The neighbor role varies considerably with specific cultures, socio-economic classes, life stages and degree of sociability.⁷ The neighbor role is to be differentiated from that of friendship and neither propinquity nor other physical design factors can produce any social relationships more intensive than mere exchange of greetings unless neighbors are compatible and perceive themselves as homogeneous.⁸ It was determined by the team that complete heterogeneity of socio-economic status, life stage and social compatibility among residential units would result in only a limited

amount of social co-existence and would often produce hostility and incompatibility.⁹

To preserve the goal of encouraging maximum experiences and exposure to other life styles through a heterogeneous sub-community, while permitting the development of social relationships among compatible neighbors, the concept of the immediate neighborhood was developed.

The immediate neighborhoods would be composed of from 15 to 30 families of similar socio-economic status, life stage and degree of sociability. The size of the immediate neighborhood would be large enough to permit a range of choice in the selection of immediate friends yet small enough to encourage maximum contact among a wide range of people of different life styles in the sub-community.

Within the immediate neighborhood it was decided that a smaller grouping of residential units called the interaction cluster would be developed. The interaction cluster would range from about three to seven residential units and could serve the day-to-day social contacts of compatible neighbors. The size and configuration of the interaction cluster would be determined by the particular socio-economic status, life stage and degree of sociability of the residents. The organization of the interaction clusters along with other applicable facilities such as a child care center, recreation areas, a laundry, and parking areas would be planned according to particular life style characteristics into the homogeneous immediate neighborhoods.

Each sub-community would be comprised of about twenty different immediate homogeneous neighborhoods along with other support facilities such as commercial, educational, and service to provide the desired heterogeneous population base.

Description of Immediate Neighborhoods

From available data the team was unable to determine any exact indication of the probable population distribution in Soul City; however, it was assumed that the majority of new arrivals would be young, both married and single, and of relatively low to moderate income.

The estimated population was classified into fifteen homogeneous groups according to income and stage in the life cycle. Few families, particularly with children, would fall into one group; however, it was decided that there are definite and discrete life stages, each requiring specific and unique design criteria, and that most family situations would fall into at least one group. The fifteen groups are as follows:

Low Income: Young married couples without children
Families with pre-school children
Families with school children
Families with teenagers
Elderly

Low and Middle Income: Young singles

Middle Income: Young married couples without children
Families with pre-school children
Families with school children
Families with teenagers
Middle-aged singles and couples without children
Elderly

High Income: Families with school children
Families with teenagers
Middle-aged singles and couples without children

In regard to income differentiation it was assumed that the distribution in Soul City would be relatively lower than the national average. Also, both low and middle income singles were considered compatible in the same grouping.

The planning and design of the immediate neighborhoods were generated by comparing life style characteristics of each group including both income level and degree of sociability. The presence and location of neighborhood facilities was also influenced by the specific needs of each group. The size and configuration of the interaction cluster related to the composition of the family and the degree of potential interaction of the family members with other residents of each group.

For example, such groups as families with pre-school children would require a rela-

tively closed interaction cluster to provide play space near the units for the children; however, families with pre-school children require three to five units due to the limited criteria of selectivity of playmate interaction. This differs from interaction clusters for families with teenagers where the cluster would be relatively open with more units per cluster due to more selective interaction criteria among teenagers.

Both a unit private outside space and a unit public outside space were included as required by each group. Outside private space would require a visual barrier from neighbors for family privacy as opposed to an ease of visual access in the unit outside public space.

The immediate neighborhood schemes were only one of many possible physical manifestations of the neighborhood design criteria through the form tendency diagrams and are by no means intended to represent the only physical design for each group. To accommodate varying degrees of interaction among neighbors due to social and reserved residents and also merely individual tastes and preferences, a wide range of choice in the physical design of each immediate neighborhood is necessary.

Implications for Neighborhood Design

The primary objective of the Soul City project was to establish design criteria for the social implications of the physical environment which would support individual maintenance and development. Individual growth is a product of experience and exposure; therefore, it was suggested that exposure to a broad array of differentiated life styles would increase an individual's awareness and tolerance of differences.

To encourage the interaction of socio-economic classes and life styles, the organization of residential units into a heterogeneous sub-community of 2000 people was proposed. Within each sub-community there would be commercial, educational and service facilities.

To promote the development of social relationships among compatible neighbors within a heterogeneous sub-community, the immediate neighborhood was advocated.

It would be composed of 15 to 30 families of similar socio-economic status, life stage, and degree of sociability — large enough to permit a range of personal contacts yet small enough to encourage interaction within the sub-community.

A smaller grouping of residential units — interaction clusters — was proposed within the immediate neighborhood for day-to-day social interaction among neighbors. Their size and configuration would vary according to their particular life styles.

The immediate neighborhood schemes were only one of many possible physical representations of the neighborhood design criteria and were not intended to represent any unique solution. Many different physical manifestations are required to accommodate individual preference and choice in neighborhood environments.

Often, little rationale has been applied to the social implications of dwelling arrangements in the residential environment. This is but an exploratory attempt to investigate the implications of physical design on human behavior.

Douglas Bennett

REFERENCES

1. *A Proposal for Planning Funds to Develop Soul City: A New Town in North Carolina; August 24, 1969.*
2. The conceptual planning for Soul City was developed by an interdisciplinary team from CDG and the Department of City and Regional Planning, U.N.C., under the direction of Dr. Sidney Cohn. The team included architects, planners, anthropologists, health planners, a political scientist, and a public administrator.
3. Gans, Herbert J., *People and Plans*. Basic Books, Inc., New York, p. 170.
4. *Ibid.*, p. 171.
5. *Ibid.*, p. 174.
6. Keller, Suzanne, *The Urban Neighborhood*. Random House, New York, p. 125.
7. *Ibid.*, p. 22.
8. Gans, op. cit., p. 154.
9. Gans, op. cit., p. 168.

Neighborhood Design Criteria

In *Neighborhood Design Criteria*, the factors affecting the spatial requirements of each group were divided into three categories: transportation factors, outdoor activities, and aspects of neighborhood. This information was then organized into a summary of the neighborhood design criteria concerning the physical components of the immediate neighborhood and the immediate neighborhood schematics.

Transportation Factors included both vehicular and pedestrian circulation components and were primarily concerned with the organization of the circulation arteries and their relationship to the dwelling units. Outdoor activities consisted of defining the principle outdoor activities and relating them both in terms of compatibility to other activities and the quality and definition of space they require. The activities were divided into groups according to their participants and rated on a scale from 1 to 5.

Aspects of Neighborhood considered both the physical and functional distances between neighbors and the optimal size of both interaction clusters and immediate neighborhood groupings.

In the *Summary of Neighborhood Design Criteria, Physical Components of the Immediate Neighborhood*, the activities were grouped according to both location and privacy ratings as to whether they are carried on in the immediate neighborhoods, interaction cluster, unit public or private outdoor space, or a combination of the above. *Immediate Neighborhood Schematics for Investigation* suggest density and physical design alternatives from the design criteria.

The form tendency diagrams propose the optimal arrangement of both units and their surrounding outdoor space in an interaction cluster. The immediate neighborhood schemes suggest a possible organization of interaction clusters and neighborhood facilities into complete neighborhoods. To show a comparison of densities, the dotted lines represent one square acre of land.

Definitions of Compatibility

1. *Location.* The range in distance from the dwelling to where the activity could take place.

1	2	3	4	5	6	7	8	9	10
adjacent to unit		cluster		neighborhood			sub-community		

2. *Noise Generated.* A measure of the quantity of noise generated by the performance of a particular activity

1	2	3	4	5
absolute quiet	soft	moderate	loud	very loud

3. *Noise Tolerance.* A measure of the maximum quantity of noise permitted for the efficient performance of a particular activity.

1	2	3	4	5
cannot coexist		neutral		coexists

4. *Frequency.* The mean of the intervals of the successive performances of a particular activity.

1	2	3	4	5
rarely	occasionally	moderately	often	constantly

5. *Type of Surface.* The type of ground covering on which an activity can best be performed.

1	2	3	4	5
hard (concrete)		no requirement		soft (sand)

6. *Penetrability.* The degree to which an activity can exist with other activities impinging on its space; where penetrability is maximum, the activity exists best with other activities.

1	2	3	4	5
impenetrable		neutral		penetrable

7. *Privacy.*

1	2	3	4	5
very important		important		unimportant

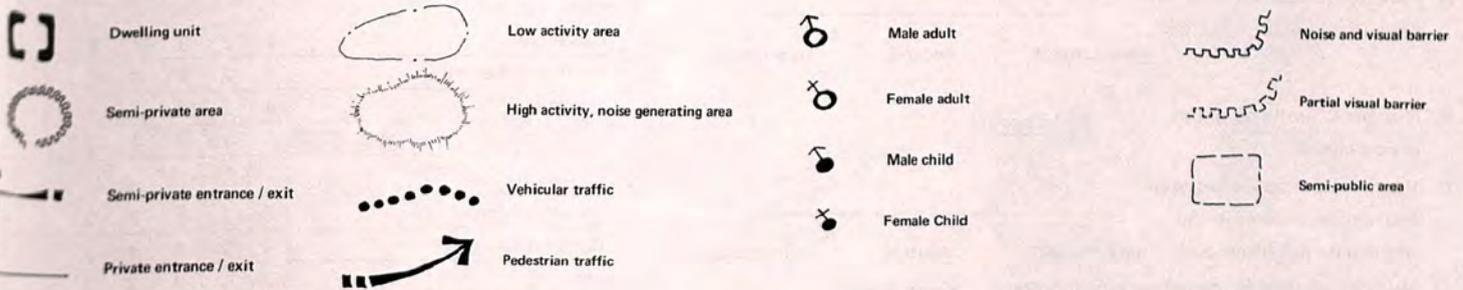
Definitions of the Quality and Determinants of Space

1	2	3	4	5
extremely	slightly	neutral	slightly	extremely

1. *Privacy / Communalilty.* The quality of space which determines the degree to which it will be shared with another activity. Privacy is defined as the absence of unwanted human stimuli and surveillance which is inversely proportional to exposure and sensory impingements.
2. *Sociopetality / Sociofugality.* The quality of the space which promotes or discourages social interaction within it. Sociopetality is achieved by the presence of elements in and of a setting which suggest and support the presence and interaction of people.
3. *Accessibility / Inaccessibility.* This is an indication of the relative ease with which a setting is approached or entered. Accessibility is achieved through minimizing the expenditure of energy.
4. *Ambiguity / Clarity.* The quality of a space dealing with its multiplicity of meaning or use. Ambiguity suggests a duplicity of meaning as opposed to singularity.
5. *Diversity / Homogeneity.* The quality of the setting which suggests the number of activities which may coexist in the setting. Diversity is a characteristic of a setting which both suggests and supports a large number of mutually compatible activities.
6. *Regularity / Irregularity.* The quality of space dealing with the degree of simplicity of form or geometric shape. Regularity is determined by pure and simple geometry.
7. *Visual Enclosure (Open / Closed).* The perceptual quality of space as to degree of being visually contained.
8. *Large / Small.* The size of the space. Large is defined as an area of approximately 20,000 sq. ft.

Form Tendency Diagrams

The following symbols are used in the Interaction Cluster and Individual Unit form tendency diagrams:



YOUNG SINGLES / LOW AND MIDDLE INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	X	:	:	:	:	:
	0	1/2	1	1 1/2	2	2 1/2	3
2. Maximum walking distance from parking to unit	:	:	:	X	:	X	
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	15-20						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	:	:	X	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	:	:	:	X	X
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important

ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters	:	X	:	:	:
	1	2	3	4	5
	max contact		neutral		min contact

Number of units per interaction cluster 14-18 people

Functional distance between interaction clusters in the immediate neighborhood	:	X	:	:	:
	1	2	3	4	5
	max contact		neutral		min contact

Number of units in immediate neighborhood 40-50 people

Importance of neighborhood identity	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	1-6	5	4	3	3	3	3
small entertaining	1-3	2	4	3	2	2	4
informal socializing	3-6	3	3	4	3	4	4
intimate socializing	1-2	2	2	3	4	1	1
individual public relaxation	1-4	2	3	3	3	4	4
individual private relaxation	1-2	2	2	3	3	1	2
B. Male Adult							
basketball	3-6	5	3	3	1	1	4
football/baseball	6-10	5	3	2	4	2	3
car repair	3-5	5	4	3	2	2	3
social gathering	2-5	4	3	4	3	3	3
C. Female Adults							
social gathering	1-4	4	3	4	3	2	3
physical sports	6-8	4	4	2	3	2	4
washing	5-6	3	3	4	3	2	4
drying	5-6	2	4	3	3	2	3

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	2	3	2	4	4	4	4
small entertaining	2	3	2	2	4	4	5	4
informal socializing	4	1	2	1	1	2	3	2
intimate socializing	1	5	2	2	5	5	3	5
individual public relaxation	4	2	3	1	1	2	3	3
individual private relaxation	1	5	3	4	5	5	3	5
B. Male Adults								
basketball	4	2	3	3	5	2	1	2
football/baseball	4	2	5	3	5	2	1	1
car repair	4	2	4	3	4	4	3	3
social gathering	4	1	2	2	2	2	4	3
C. Female Adults								
social gathering	4	1	2	2	2	3	4	3
physical sports	4	2	4	4	4	3	2	2
washing	3	2	2	3	3	4	3	4
drying	3	3	1	2	5	3	3	3

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: size 1 and 2 bedrooms
no. of units 20-25
- B. Parking: no. of spaces 20-25
no. of groupings 1-2
size 1 group 60x120
2 groups 60x60

[BA=both adults; MA=male adults; FA=female adults]

C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Location Scale 5 and 6)

- | | |
|----------------------|-------------------------|
| partying—BA | informal socializing—BA |
| football/baseball—MA | physical sports—FA |
| washing—FA | drying—FA |

D. Components of Activities Within Interaction Clusters (Compatibility of Activities Location Scale 3 and 4)

- | | |
|-------------------------|---------------|
| partying—BA | car repair—MA |
| social gathering—MA | basketball—MA |
| informal socializing—BA | |

E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)

- intimate socializing—BA individual private relaxation—BA

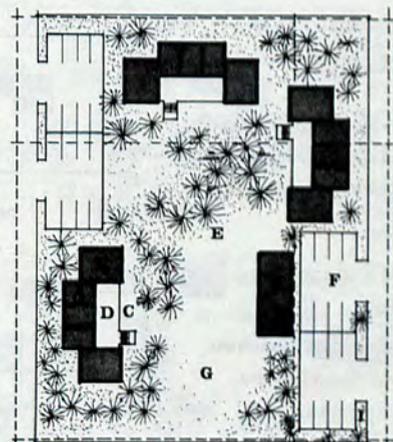
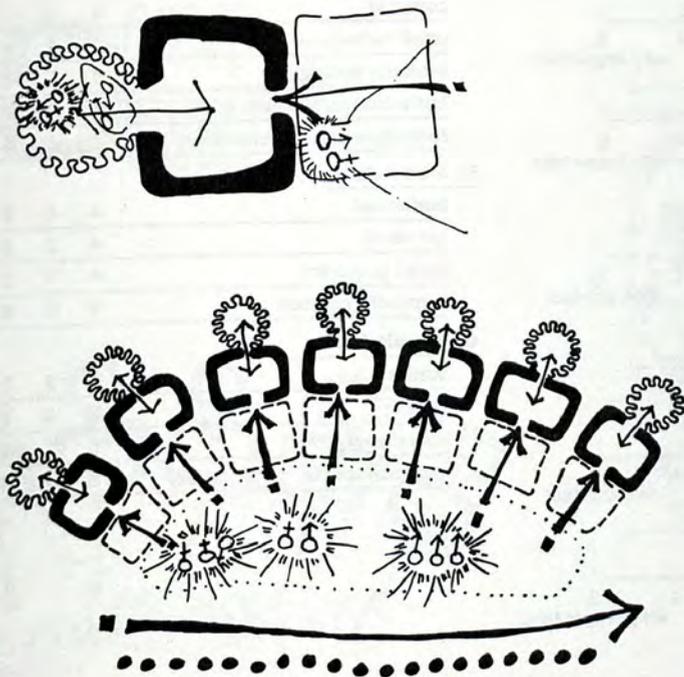
F. Unit Public Yard (Compatibility of Activity Location Scale 1 and 2, and Privacy Scale 4 and 5)

- small entertaining—BA individual public relaxation—BA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
1. Walk-up apartments (8-10 dwelling units per acre)
 2. High rise apartments (20+ dwelling units per acre)
- B. Use of Module
1. 12 foot frontage / 2 story
 2. 24 foot frontage / 2 story
- C. Placement of Parking
1. peripheral parking
 2. internal parking
- D. Building Arrangement
1. cluster

- A Dwelling Unit—1 person
B Dwelling Unit—2 persons
C Interaction Cluster
D Cluster Common Area
E Immediate Neighborhood Gathering Area
F Parking
G Athletic Area
H Neighborhood Center and Laundry
I Bus Stop



YOUNG MARRIEDS WITHOUT CHILDREN / LOW INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	X	:	:	:	:
	0	½	1	1½	2	2½	3
2. Maximum walking distance from parking to unit	:	:	X	X	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	10						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	:	X	:	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	:	:	:	X	X
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important

ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact
B. Number of units per interaction cluster	6-8 units				
C. Functional distance between interaction clusters in the immediate neighborhood	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact
D. Number of units in immediate neighborhood	25-30 units				
E. Importance of neighborhood identity	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	1-4	5	4	4	2	3	3
small entertaining	1-3	4	2	5	3	2	2
informal public socializing	1-2	2	2	3	3	1	1
individual public relaxation	1-4	2	3	3	3	4	4
individual private relaxation	1-2	2	1	3	3	1	2
B. Male Adults							
basketball	5-6	4	3	4	1	1	4
car repair	3-5	5	4	3	1	2	4
social gathering	1-5	4	3	3	3	3	3
football / baseball	6-10	5	4	2	4	1	5
C. Female Adults							
washing	5-6	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
socializing	1-5	3	3	4	3	4	4
physical sports	3-10	4	4	2	4	2	5

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	3	4	2	4	4	3	3
small entertaining	3	4	3	2	4	4	3	4
intimate socializing	1	5	4	2	5	5	3	5
individual public relaxation	4	2	2	2	2	2	3	2
individual private relaxation	2	4	4	2	4	4	3	4
B. Male Adults								
basketball	4	4	4	3	4	3	2	3
car repair	4	2	3	3	4	3	3	3
social gathering	4	1	2	2	2	2	3	3
football / baseball	4	2	4	4	4	2	1	1
C. Female Adults								
washing	3	2	2	3	3	5	3	4
drying	3	3	1	2	5	3	3	3
socializing	5	1	2	2	2	3	4	3
physical sports	4	2	4	4	4	3	2	2

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

A. Dwelling Units: size 1 and 2 bedrooms
no. of units 20-30

B. Parking: no. of spaces 25
no. of groupings 2 or 3
size 2 groups 64x70
3 groups 64x50

[BA=both adults; MA=male adults; FA=female adults]

C. Spatial Components of Activities for the Entire Neighborhood
(Compatibility of Activities Location Scale 5 and 6)

basketball—BA	car repair—MA
gathering—MA	washing—FA
physical sports—FA	socializing—FA
football/baseball—MA	

D. Components of Activities Within Interaction Clusters
(Compatibility of Activities Location Scale 3 and 4)

partying—BA	small entertaining—BA
individual public relaxation—BA	socializing—FA
individual private relaxation—BA	

E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)

intimate socializing—BA	drying—FA
partying—BA	small entertaining—BA
individual private relaxation—BA	gathering—MA
socializing—FA	

F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)

individual public relaxation—BA socializing—FA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

A. Building Types

1. Townhouse (6-15 dwelling units per acre)
2. Walk-up apartments (8-20 dwelling units per acre)

B. Use of Module

1. Varying frontage / 1- and 2-stories

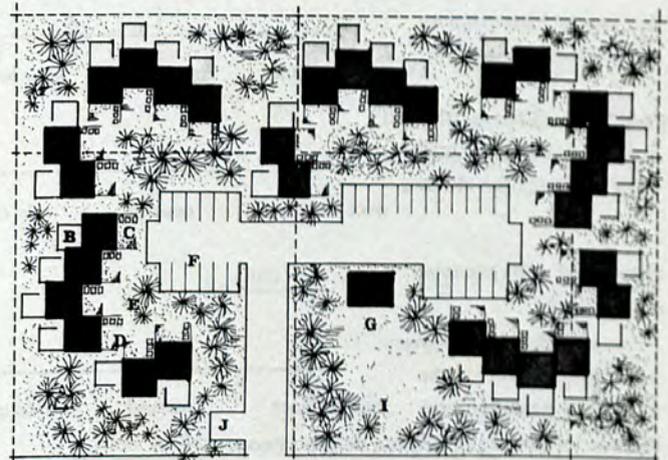
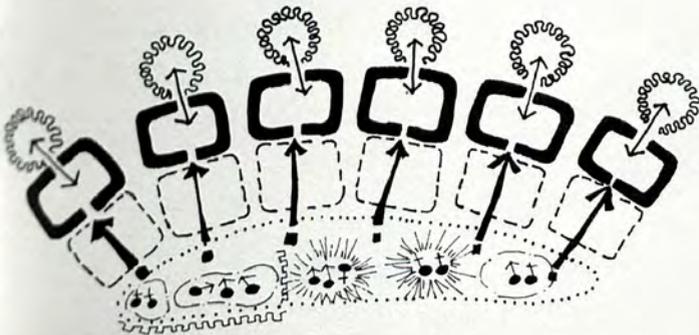
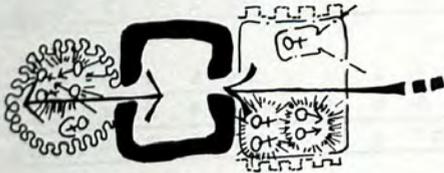
C. Placement of Parking

1. peripheral parking
2. internal parking

D. Building Arrangement

1. linear
2. centroidal

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Common Area
- F Parking
- G Neighborhood Gathering and Recreation Area
- H Laundry
- I Athletic Area
- J Automobile Repair Area



FAMILIES WITH PRE-SCHOOL CHILDREN / LOW INCOME
 NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit

	:	:	X	X	:	:	:
	0	½	1	1½	2	2½	3

2. Maximum walking distance from parking to unit

	X	:	X	:	:	:
	0	100	200	300	400	500
			(in feet)			

3. Number of parking spaces per grouping

9-14

3. Public Transportation

Relative need for proximity in relation to other neighborhoods

	:	:	:	:	X
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling

	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

2. Maximum walking distance

	X	X	:	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy

	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important

2. Unit Visual Privacy (privacy from pedestrian artery)

	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important

3. View of Pedestrian Artery from Inside Unit

	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters

	X	:	:	:	:
	1	2	3	4	5
	max contact		neutral		min contact

Number of units per interaction cluster

4-5 units

Functional distance between interaction clusters in the immediate neighborhood

	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact

Number of units in immediate neighborhood

20-24 units

Importance of neighborhood identity

	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	2-10	5	5	2	2	2	3
small entertaining	1-4	5	2	2	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1-2
B. Male Adults							
physical sports	5-10	5	4	2	1	1	4
car repair	1-6	2	3	2	1	1	3
reading	1-4	1	1	3	3	1	2
social gathering	1-3	4	4	3	3	2	2
C. Female Adults							
washing	5-6	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-7	2	3	2	4	1	4
child care	1-7	4	4	4	3	2	4
socializing	1-5	3	3	4	3	4	4
D. Both Children							
tricycle riding	2-4	3	3	4	1	1	4
running	1-4	5	4	4	3	4	5
digging	0-2	2	3	3	5	2	4
E. Male Children							
horseplay	2-4	5	4	3	4	1	5
physical games	2-4	4	3	4	3	1	5
manipulative skills	2-4	3	2	4	4	2	3
F. Female Children							
active games	2-4	4	3	4	3	2	4
passive games	1-4	2	2	3	3	2	3
dramatic play	1-5	2	2	3	3	2	2

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	3	1	2	3	1	4	4	4
small entertaining	2	2	2	2	1	5	4	5
intimate socializing	1	2	3	2	2	5	4	5
individual public relaxation	4	2	2	2	2	2	4	4
individual private relaxation	2	4	3	1	4	4	3	5
B. Male Adults								
physical sports	5	1	2	2	2	3	2	1
car repair	3	2	1	4	4	3	2	3
reading	1	4	3	3	3	4	2	5
social gathering	5	2	1	2	2	4	4	3
C. Female Adults								
washing	4	2	1	4	4	4	3	3
drying	4	2	2	4	4	3	3	3
gardening	4	2	2	4	4	3	4	3
child care	4	1	1	4	4	4	4	3
socializing	4	1	1	3	2	2	4	2
D. Both Children								
tricycle riding	3	4	4	2	3	2	3	3
running	3	4	4	2	3	3	3	4
digging	2	3	3	4	2	4	4	5
E. Male Children								
horseplay	4	3	4	2	2	4	2	4
physical games	5	2	4	2	2	3	4	3
manipulative skills	2	3	3	3	3	4	4	5
F. Female Children								
active games	4	2	2	2	2	3	3	3
passive games	3	4	3	2	2	4	3	5
dramatic play	2	2	4	2	2	5	4	5

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

A. Dwelling Units: size 2 and 3 bedrooms
no. of units 20-24

B. Parking: no. of spaces 30-36
no. of groupings 2-3
size 2 groups 64x90
3 groups 64x50

[BA=both adults; MA=male adults; FA=female adults; BC=both children; MC=male children; FC=female children]

C. Spatial Components of Activities for the Entire Neighborhood
(Compatibility of Activities Location Scale 5 and 6)

partying—BA
gardening—BA
physical sports—MA
socializing—BA
car repair—MA
child care—FA
washing—FA

D. Components of Activities Within Interaction Clusters
(Compatibility of Activities Location 3 and 4)

tricycle riding—BC
digging—BC
physical games—MC
manipulative skills—MC
individual private relaxation—BA
running—BC
horseplay—MC;
dramatic play—FC
ind. public relaxation—BA

E. Unit Private Yard (Compatibility of Activities Location
Scale 1 and 2, and Privacy Scale 1-3)

child care—FA
small entertaining—BA
drying—FA
socializing—BA
gardening—BA
reading—MA

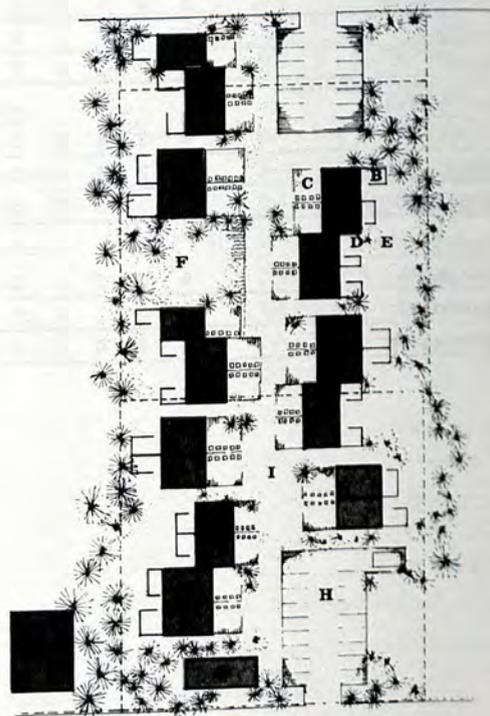
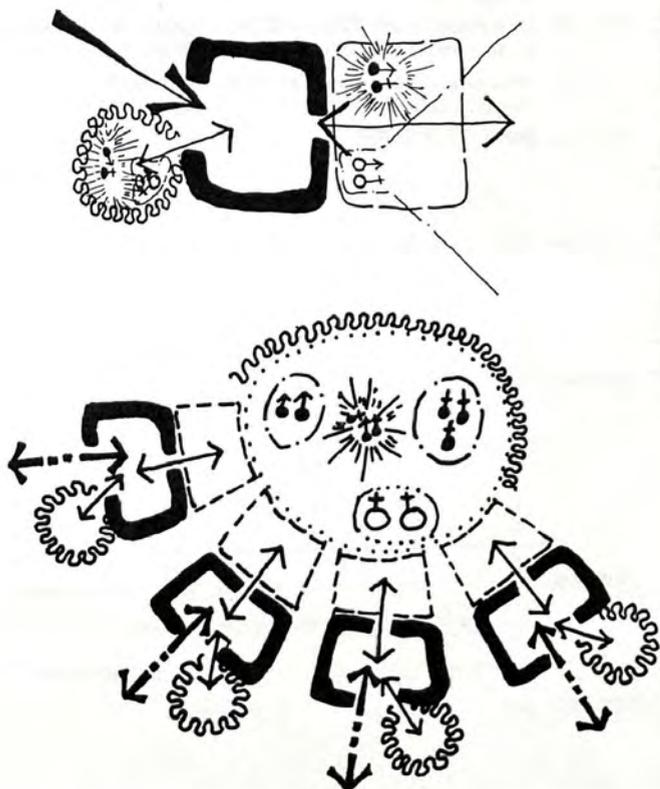
F. Unit Public Yard (Compatibility of Activities Location
Scale 1 and 2, and Privacy Scale 4 and 5)

individual public relaxation—BA
tricycle riding—BC
passive games—BC
running—BC
socializing—BA

VII. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 1. Single family, attached (4-12 dwelling units per acre)
 2. Townhouse (6-15 dwelling units per acre)
- B. Use of Module
 1. 24 foot frontage / 2-story
 2. 24 foot frontage / 1-story
- D. Placement of Parking
 1. peripheral parking
 2. internal parking
- D. Building Arrangement
 1. linear
 2. centroidal

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Play Area
- F Immediate Neighborhood and Recreation Area
- G Laundry
- H Parking
- I Neighborhood Gathering Area



FAMILIES WITH SCHOOL AGE CHILDREN / LOW INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit : : X X : : :
 0 1/2 1 1 1/2 2 2 1/2 3

2. Maximum walking distance from parking to unit X : X : : :
 0 100 200 300 400 500
 (in feet)

3. Number of parking spaces per grouping 10-15

B. Public Transportation

Relative need for proximity in relation to other neighborhoods : : : X :
 1 2 3 4 5
 min need neutral max need

C. Drop-off areas for vehicles

1. Visual access from dwelling X : : : :
 1 2 3 4 5
 unimportant important very important

2. Maximum walking distance : X X : : :
 0 50 100 150 200
 (in feet)

D. Pedestrian

1. Unit Acoustical Privacy : X : : : :
 1 2 3 4 5
 unimportant important very important

2. Unit Visual Privacy (privacy from pedestrian artery) : : : : X
 1 2 3 4 5
 unimportant important very important

3. View of Pedestrian Artery from Inside Unit : : : X : :
 1 2 3 4 5
 unimportant important very important

II. ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters : X : : : :
 1 2 3 4 5
 max contact neutral min contact

B. Number of units per interaction cluster 5-6 units

C. Functional distance between interaction clusters in the immediate neighborhood : : X : : :
 1 2 3 4 5
 max contact neutral min contact

D. Number of units in immediate neighborhood 24-30 units

E. Importance of neighborhood identity : : X : : :
 1 2 3 4 5
 unimportant important very important

III. COMPATIBILITY OF ACTIVITIES

Types Compatibility
 1 2 3 4 5 6 7

A. Both Adults

partying	2-10	5	5	2	2	2	4
small entertaining	1-4	5	5	2	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1-2

B. Male Adults

physical sports	5-10	5	4	2	1	1	4
car repair	1-6	2	3	2	1	1	3
social gathering	1-3	4	4	3	3	2	2
reading	1-4	1	1	3	3	1	2

C. Female Adult

washing	5-6	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-2	2	3	2	4	1	4
socializing	1-5	3	3	4	3	4	4
child care (play)	1-7	4	4	4	3	2	4

D. Both Children

dancing	3-7	5	2	2	3	2	3
bicycle riding	2-6	3	3	4	1	1	4
running	1-5	5	4	4	3	4	5
digging	0-2	2	3	3	5	2	4

E. Male Children

horseplay	2-4	5	4	3	4	1	5
physical games	4-5	4	3	4	3	1	5
manipulative skills	2-4	3	2	4	4	2	3
passive games	1-4	2	2	3	3	2	2

F. Female Children

active games	3-6	4	3	4	3	2	4
playing house	1-6	2	2	3	3	2	3
passive games	1-4	2	2	3	3	2	2

V. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual public relaxation	4	3	2	1	1	2	3	3
individual private relaxation	1	5	2	4	5	5	3	5
Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
car repair	4	3	4	3	4	4	2	3
social gathering	2	2	2	1	2	3	3	3
reading	2	4	2	2	4	4	3	4
Female Adults								
washing	4	2	3	4	3	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
socializing	5	1	2	2	2	3	4	3
child care (play)	4	2	2	2	2	3	4	3
Both Children								
dancing	4	1	2	3	3	4	3	3
bicycle riding	5	3	3	2	2	2	5	3
running	4	3	3	2	2	3	5	3
digging	2	4	2	4	3	4	5	4
Male Children								
horseplay	4	2	3	4	4	3	3	3
physical games	3	2	4	5	5	4	1	1
manipulative skills	2	4	4	4	4	4	5	3
passive games	2	4	3	2	4	4	4	4
Female Children								
active games	4	2	4	4	4	4	2	2
playing house	2	4	2	2	4	4	4	4
passive games	2	4	2	3	4	5	3	5

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling units: size 3 and 4 bedrooms
no. of units 24-30
- B. Parking: no. of spaces 30-35
no. of groupings 2-4
size 2 groups 70x60
4 groups 50x60

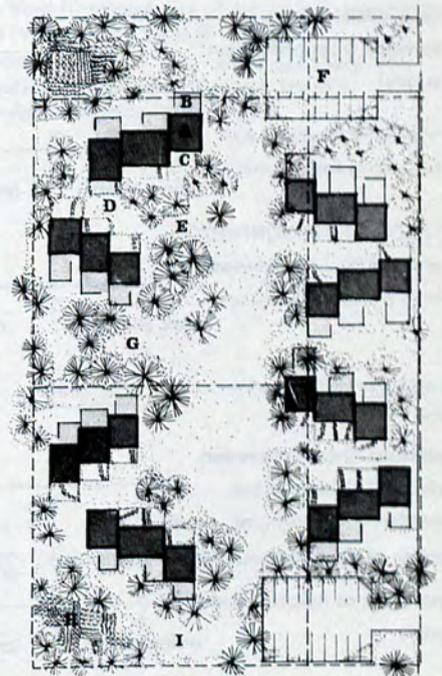
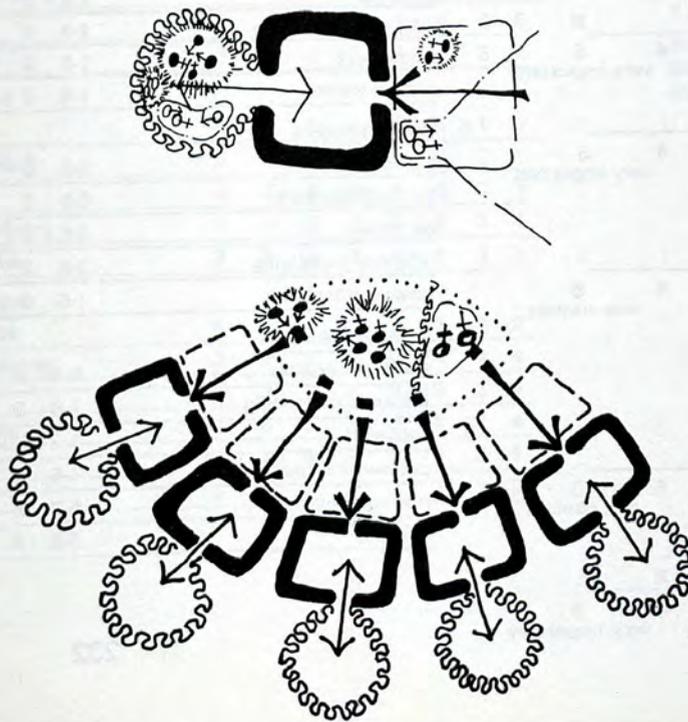
[BA=both adults; MA=male adults; FA=female adults; BC=both children; MC=male children; FC=female children]

- C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Location Scale 5 and 6)
 - dancing—BC bicycle riding—BC
 - physical games—MC active games—FC
 - partying—BA physical sports—MA
 - washing—FA child care—FA
- D. Components of Activities Within Interaction Clusters (Compatibility of Activities Location Scale 3 and 4)
 - manipulative skills—MC car repair—MA
 - child care—FA digging—BC
 - passive games—MC dramatic play—FC
 - small entertaining—BA socializing—FA
 - individual public relaxation—BA social gathering—MA
- E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)
 - passive games—MC&FC drying—FA
 - intimate socializing—BA reading—MA
 - individual private relaxation—BA gardening—FA
- F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)
 - digging—BC social gathering—MA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 - 1. Single family, attached (4-12 dwelling units per acre)
 - 2. Townhouse (6-15 dwelling units per acre)
- B. Use of Module
 - 1. 24 foot frontage / 2-story
 - 2. 24 foot frontage / 1-story
- C. Placement of Parking
 - 1. peripheral parking
 - 2. internal parking
- D. Building Arrangement
 - 1. linear
 - 2. centroidal

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public— Outside
- D Interaction Cluster
- E Cluster Common Area
- F Parking
- G Immediate Neighborhood Gathering and Recreation Area
- H Neighborhood Garden
- I Athletic Area



FAMILIES WITH TEENAGERS / LOW INCOME NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

- A. Parking**
- Number of spaces per unit
: : : X : : :
0 1/2 1 1 1/2 2 2 1/2 3
 - Maximum walking distance from parking to unit
: X X : : :
0 100 200 300 400 500
(in feet)
 - Number of parking spaces per grouping
10

- B. Public Transportation**
- Relative need for proximity in relation to other neighborhoods
- : X : : :
1 2 3 4 5
min need neutral max need

- C. Drop-off areas for vehicles**
- Visual access from dwelling
: X : : :
1 2 3 4 5
unimportant important very important
 - Maximum walking distance
: X X : : :
0 50 100 150 200
(in feet)

- D. Pedestrian**
- Unit Acoustical Privacy
: : : X :
1 2 3 4 5
unimportant important very important
 - Unit Visual Privacy (privacy from pedestrian artery)
: : : : X
1 2 3 4 5
unimportant important very important
 - View of Pedestrian Artery from Inside Unit
: X : : :
1 2 3 4 5
unimportant important very important

SPECTS OF NEIGHBORHOOD

- Functional distance between units in interaction clusters
: : X : :
1 2 3 4 5
max contact neutral min contact
- Number of units per interaction cluster
5-7 units
- Functional distance between interaction clusters in the immediate neighborhood
: X : : :
1 2 3 4 5
max contact neutral min contact
- Number of units in immediate neighborhood
25-30 units
- Importance of neighborhood identity
: : : X :
1 2 3 4 5
unimportant important very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	2-10	5	5	2	2	2	4
small entertaining	1-4	5	5	2	2	2	4
intimate socializing	1	3	3	3	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1-2
B. Male Adults							
physical sports	5-10	5	4	2	1	1	4
car repair	1-6	2	3	2	1	1	3
social gathering	1-3	4	4	3	3	2	2
reading	1-4	1	1	3	3	1	2
C. Female Adults							
washing	5-6	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-2	2	3	2	4	1	4
socializing	1-5	3	3	4	3	4	4
D. Both Teenagers							
dancing	5-10	5	5	3	1	1	4
intimate socializing	2-8	2	2	3	4	1	1
partying	1-8	5	5	3	3	4	4
informal socializing	1-9	4	4	4	3	3	4
homework	1-8	2	1	3	3	2	2
passive games	1-5	3	3	3	3	3	3
E. Male Teenagers							
basketball	5-8	5	4	4	1	1	4
football/baseball	5-9	5	3	3	4	2	4
car repair	3-6	2	4	3	1	3	4
informal socializing	3-8	3	4	4	3	3	4
passive activities	1-6	3	4	4	3	3	4
F. Female Teenagers							
spectator sports	5-9	4	5	2	3	4	4
informal socializing	1-8	3	4	4	3	4	4
babysitting	1-3	3	3	2	3	3	3
passive activities	1-6	3	3	3	3	3	3
physical sports	5-8	5	5	3	3	2	4
dancing	3-8	4	4	4	2	3	4

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual private relaxation	1	5	2	4	5	5	3	5
individual public relaxation	4	3	2	1	1	5	3	3
B. Male Adults								
physical sports	4	2	3	4	4	2	2	2
car repair	4	3	4	3	4	4	2	3
social gathering	2	2	2	1	2	3	3	3
reading	2	4	2	2	4	4	3	4
C. Female Adults								
washing	4	2	3	4	3	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
socializing	5	1	2	2	2	3	4	3
D. Both Teenagers								
dancing	5	1	4	2	4	4	3	3
intimate socializing	1	5	5	3	5	5	3	5
partying	5	4	4	2	4	4	3	3
informal socializing	4	3	3	2	2	3	4	4
homework	2	3	3	3	5	4	4	5
passive games	3	3	3	3	3	4	3	4
E. Male Teenagers								
basketball	5	2	4	4	4	4	1	3
football / baseball	5	2	4	4	4	2	2	1
car repair	4	3	4	4	4	4	3	3
informal socializing	3	3	3	2	2	3	3	4
passive activities	3	3	3	2	2	3	3	3
F. Female Teenagers								
spectator sports	5	1	4	2	2	3	3	2
informal socializing	3	2	2	2	2	4	4	4
babysitting	3	3	3	3	3	3	3	4
passive activities	2	4	3	2	3	4	4	4
physical sports	4	2	4	3	4	3	3	1
dancing	3	2	2	2	3	3	3	3

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

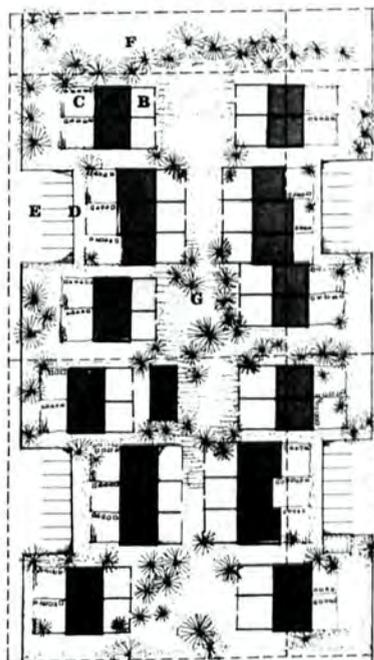
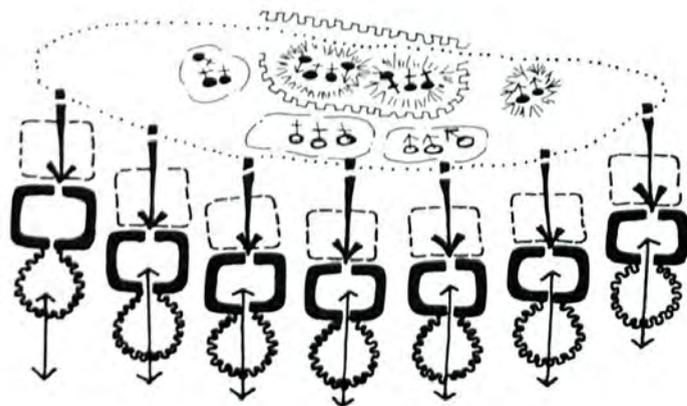
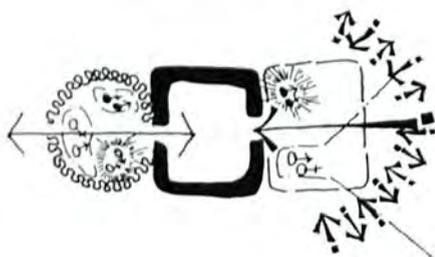
- A. Dwelling Units: size 3-5 bedrooms
no. of units 25-30
- B. Parking: no. of spaces 30-40
no. of groupings 3-4
- [BA=both adults; BT=both teenagers; MA=male adults; FA=female adults; MT=male teenagers; FT=female teenagers]
- C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Location Scale 5 and 6)
- | | |
|----------------------------|---------------------|
| dancing—BT | spectator sports—FT |
| intimate socializing—BT | active sports—FT |
| partying—BT | partying—BA |
| basketball—MT | physical sports—MA |
| football / baseball—MT | car repair—MA |
| informal socializing—MT&FT | washing—FA |
- D. Spatial Components for Activities Within Interaction Clusters (Compatibility of Activities Location Scale 3 and 4)
- | | |
|----------------------------|-----------------------|
| informal socializing—BT | passive activities—MT |
| homework—BT | dancing—FT |
| passive games—BT | social gathering—MA |
| informal socializing—MT&FT | socializing—FA |
- E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2 and Privacy Scale 1-3)
- | | |
|-------------------------|----------------------------------|
| homework—BT | individual private relaxation—BA |
| passive activities—MT | reading—MA |
| babysitting—FT | drying—FA |
| intimate socializing—BA | |
- F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2 and Privacy Scale 4 and 5)
- | | |
|---------------------------------|---------------------|
| small entertaining—BA | social gathering—MA |
| passive activities—FT | gardening—FA |
| individual public relaxation—BA | |

IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 1. single family attached (4-12 dwelling units per acre)
 2. townhouse (6-15 dwelling units/acre)
- B. Use of Modules
 1. 24 foot frontage / 2-story
 2. 24 foot frontage / 1-story
- C. Placement of Parking

peripheral parking
- D. Building Arrangement
 1. linear
 2. centroidal

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Parking
- F Neighborhood Athletic Area
- G Immediate Neighborhood Gathering Area



ELDERLY / LOW INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	X	X	:	:	:	:
	0	1/2	1	1 1/2	2	2 1/2	3
2. Maximum walking distance from parking to unit	X	X	:	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	5-6						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	:	:	:	X
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	X	X	:	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important

II. ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters	:	X	:	:	:
	1	2	3	4	5
	max contact		neutral		min contact
B. Number of units per interaction cluster	4-5 people				
C. Functional distance between interaction clusters in the immediate neighborhood	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact
D. Number of units in immediate neighborhood	20-26 people				
E. Importance of neighborhood identity	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	3-6	4	4	2	3	4	4
small entertaining	1-3	3	3	4	3	3	3
informal socializing	1-5	3	4	4	3	3	4
gardening	1-2	2	2	4	4	2	2
passive games	1-4	2	2	4	3	3	4
B. Male Adults							
informal socializing	1-4	4	3	4	3	4	4
passive games	1-4	4	4	3	3	3	3
C. Female Adults							
washing	3-6	3	3	4	3	2	4
drying	1-2	2	3	4	3	2	2
babysitting	1-3	4	3	3	4	4	4
informal socializing	1-3	3	3	5	3	3	4
passive games	1-3	2	2	4	3	2	3

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	2	3	4	4	4	2	3
small entertaining	2	3	2	2	2	4	4	5
informal socializing	4	1	1	2	1	2	4	4
gardening	2	4	2	3	4	4	4	5
passive games	3	3	2	3	4	4	4	4
B. Male Adults								
informal socializing	5	1	2	3	2	4	4	4
passive games	3	3	2	3	4	3	4	4
C. Female Adults								
washing	3	3	2	3	4	5	4	3
drying	2	4	2	3	4	4	3	4
babysitting	4	2	2	2	2	2	4	3
informal socializing	4	2	2	2	2	2	4	4
passive games	3	3	2	3	4	3	4	4

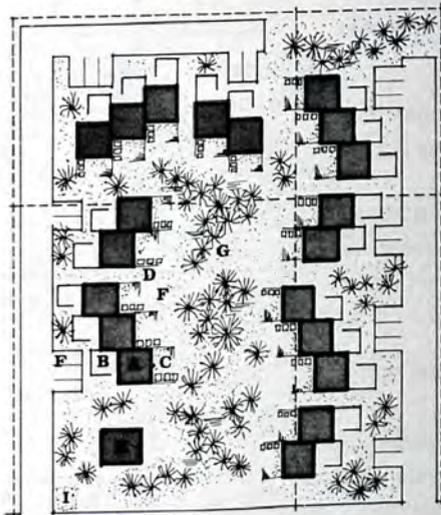
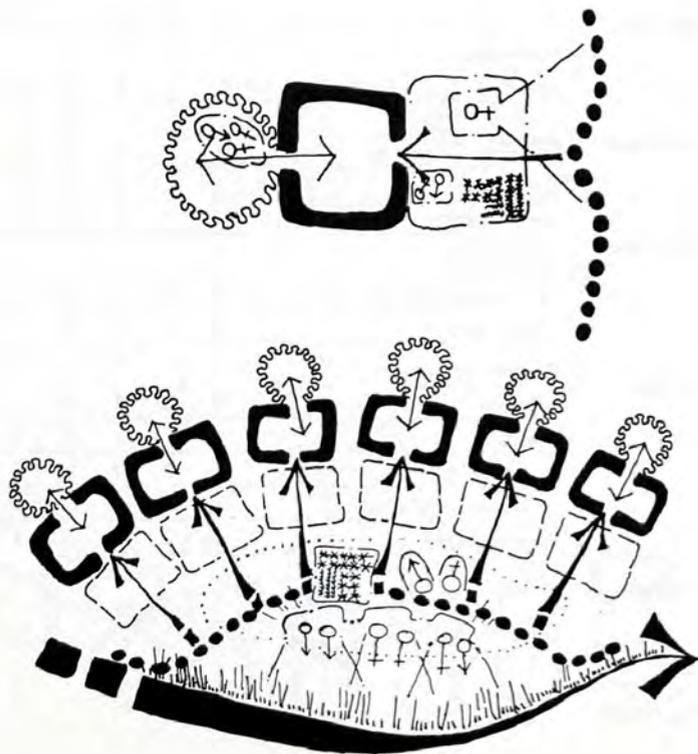
SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: size 1-2 bedrooms
no. of units 20
- B. Parking: no. of spaces 20
no. of groupings 4
size 4 groups 50x35
[=both adults; MA=male adults; FA=female adults]
- C. Spatial Components of Activities for the Entire Neighborhood
(Compatibility of Activities Location Scale 5 and 6)
partying—BA
- D. Components of Activities Within Interaction Clusters
(Compatibility of Activities Location Scale 3 and 4)
partying—BA washing—FA
informal socializing—BA,MA,FA passive games—MA & FA
- E. Unit Private Yard (Compatibility of Activities Location
Scale 1 and 2, and Privacy Scale 1-3)
drying—FA outdoor cooking—BA
small entertaining—BA
- F. Unit Public Yard (Compatibility of Activities Location
Scale 1 and 2, and Privacy Scale 4 and 5)
babysitting—FA gardening—BA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 1. Single family, attached (4-12 dwelling units per acre)
 2. Townhouse (6-15 dwelling units per acre)
- B. Use of Module
 1. 12 foot frontage / 1-story
 2. 24 foot frontage / 1-story
- C. Placement of Parking
 1. peripheral parking
- D. Building Arrangement
 1. linear
 2. centroidal

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public— Outside
- D Interaction Cluster
- E Cluster Common Area
- F Cluster Parking
- G Immediate Neighborhood Gathering and Recreation Area
- H Laundry
- I Bus Stop



YOUNG MARRIEDS WITHOUT CHILDREN / MIDDLE INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit : : X : : : :
0 1/2 1 1 1/2 2 2 1/2 3

2. Maximum walking distance : : X X : : :
from parking to unit 0 100 200 300 400 500
(in feet)

3. Number of parking spaces : : : : : : :
per grouping 8-10

B. Public Transportation

Relative need for proximity : : X : : :
in relation to other neigh- 1 2 3 4 5
bor hoods min need neutral max need

C. Drop-off areas for vehicles

1. Visual access from dwell- : : X : : : :
ing 1 2 3 4 5
unimportant important very important

2. Maximum walking distance : : : X X
0 50 100 150 200
(in feet)

D. Pedestrian

1. Unit Acoustical Privacy : : X : : : :
1 2 3 4 5
unimportant important very important

2. Unit Visual Privacy : : : X : : :
(privacy from pedestrian 1 2 3 4 5
artery) unimportant important very important

3. View of Pedestrian Ar- : : X : : : :
tery from Inside Unit 1 2 3 4 5
unimportant important very important

II. ASPECTS OF NEIGHBORHOOD

A. Functional distance between : : X : : : :
units in interaction clusters 1 2 3 4 5
max contact neutral min contact

B. Number of units per inter- : : : : : : :
action cluster 4-6 units

C. Functional distance between : : X : : : :
interaction clusters in the 1 2 3 4 5
immediate neighborhood max contact neutral min contact

D. Number of units in immediate neighborhood 20-25 units

E. Importance of neighborhood : : : X : : :
identity 1 2 3 4 5
unimportant important very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	1-4	5	4	4	2	3	2
small entertaining	1-3	4	2	5	3	2	2
intimate socializing	1-2	2	2	3	3	1	1
individual public relaxation	1-4	2	2	3	3	4	4
individual private relaxation	1-2	2	1	3	3	1	2
outdoor cooking	1-2	4	2	5	3	2	2

B. Male Adults

basketball	5-6	4	4	4	1	1	4
car repair	3-5	5	4	3	1	2	4
social gathering	1-4	4	3	3	3	3	2
football/baseball	6-10	5	4	2	4	1	5

C. Female Adults

washing	4-5	3	3	4	3	2	4
drying	4-5	2	3	3	3	2	3
socializing	1-4	3	3	4	3	4	4
physical sports	3-10	4	4	2	4	2	5

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants						
	1	2	3	4	5	6	7
A. Both Adults							
partying	4	3	4	2	4	4	3
small entertaining	2	4	3	2	4	4	3
intimate socializing	1	5	4	2	5	5	3
individual public relaxation	4	2	2	2	2	2	3
individual private relaxation	2	4	4	2	4	4	3
outdoor cooking	3	2	3	2	4	4	3

B. Male Adults

basketball	4	4	4	3	4	3	2
car repair	4	2	3	3	3	3	3
social gathering	4	1	2	2	2	2	3
football/baseball	4	2	4	4	4	2	1

C. Female Adults

washing	3	2	2	3	3	4	3
drying	2	3	1	2	5	3	3
socializing	5	1	2	2	2	3	4
physical sports	4	2	4	4	4	3	2

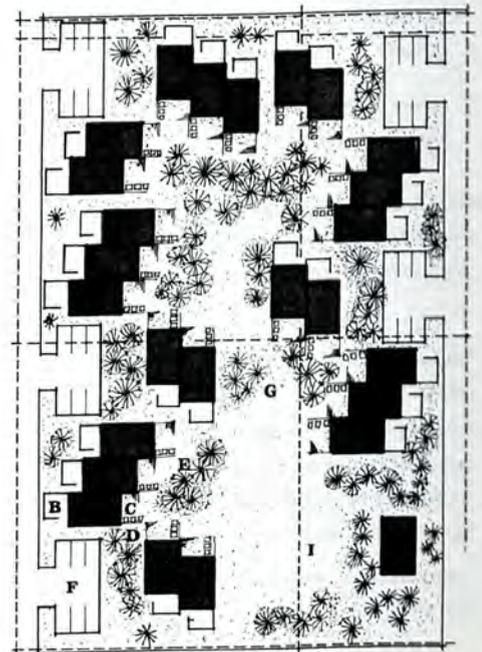
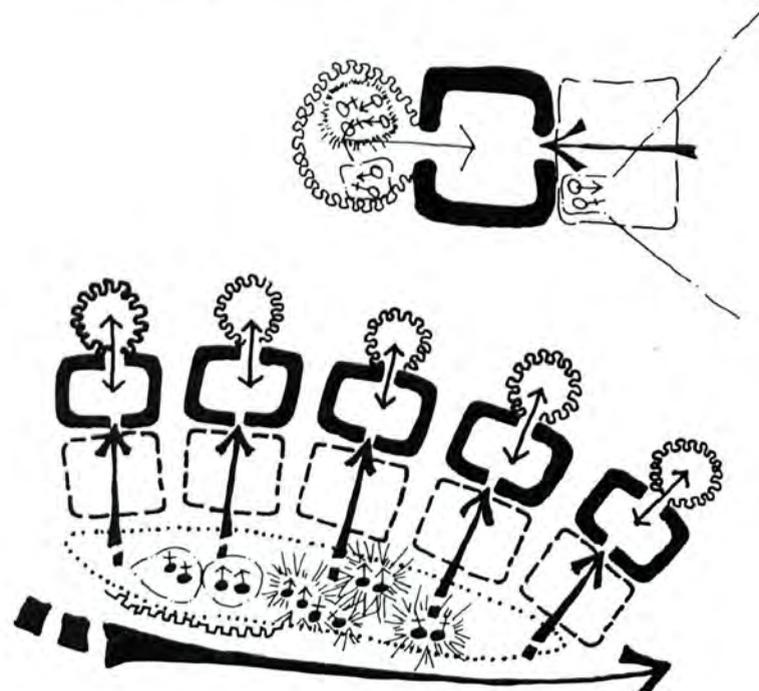
V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: size 1 and 2 bedrooms
no. of units 20-25
- B. Parking: no. of spaces 25
no. of groupings 3-5
size 3 groups—64x50
- BA=both adults; MA=male adults; FA=female adults]
- C. Spatial Components of Activities for the Entire Neighborhood
(Compatibility of Activities Location Scale 5 and 6)
- | | |
|----------------------|----------------|
| basketball—MA | car repair—MA |
| social gathering—MA | washing—FA |
| physical sports—FA | drying—FA |
| football/baseball—MA | socializing—FA |
- D. Components of Activities Within Interaction Clusters
(Compatibility of Activities Location Scale 3 and 4)
- | | |
|----------------------------------|-----------------------|
| partying—BA | small entertaining—BA |
| individual public relaxation—BA | socializing—FA |
| individual private relaxation—BA | |
- E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)
- | | |
|----------------------------------|-----------------------|
| intimate socializing—BA | outdoor cooking—BA |
| partying—BA | small entertaining—BA |
| individual private relaxation—BA | social gathering—MA |
| socializing—FA | |
- F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)
- | | |
|---------------------------------|----------------|
| individual public relaxation—BA | socializing—FA |
|---------------------------------|----------------|

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
1. Townhouse (6-15 dwelling units per acre)
 2. Walk-up apartments (8-20 dwelling units per acre)
- B. Use of Module
1. varying frontage/one and two story
- C. Placement of Parking
1. peripheral parking
 2. internal parking
- D. Building Arrangement
1. linear
 2. centroidal

- A Dwelling Unit
B Unit Private—Outside
C Unit Public—Outside
D Interaction Cluster
E Cluster Common Area
F Cluster Parking
G Immediate Neighborhood Gathering and Recreation
H Laundry
I Athletic Area



**FAMILIES WITH PRE-SCHOOL CHILDREN / MIDDLE INCOME
NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS**

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	X	X	:	:	:
	0	½	1	1½	2	2½	3
2. Maximum walking distance from parking to unit	X	X	:	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	<u>5-6</u>						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	X	:	:	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	X	:	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	:	X	X	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	X	:	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important

II. ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters

	:	X	:	:	:
	1	2	3	4	5
	max contact		neutral		min contact

B. Number of units per interaction cluster

4-5 units

C. Functional distance between interaction clusters in the immediate neighborhood

	:	:	:	X	:
	1	2	3	4	5
	max contact		neutral		min contact

D. Number of units in immediate neighborhood

18-22 units

E. Importance of neighborhood identity

	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important

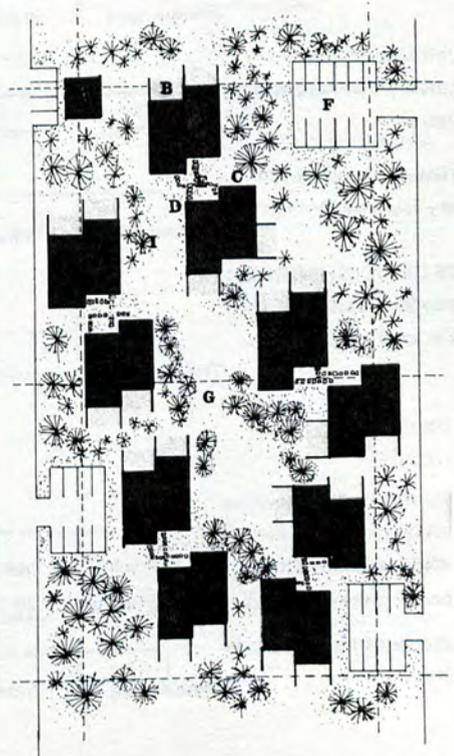
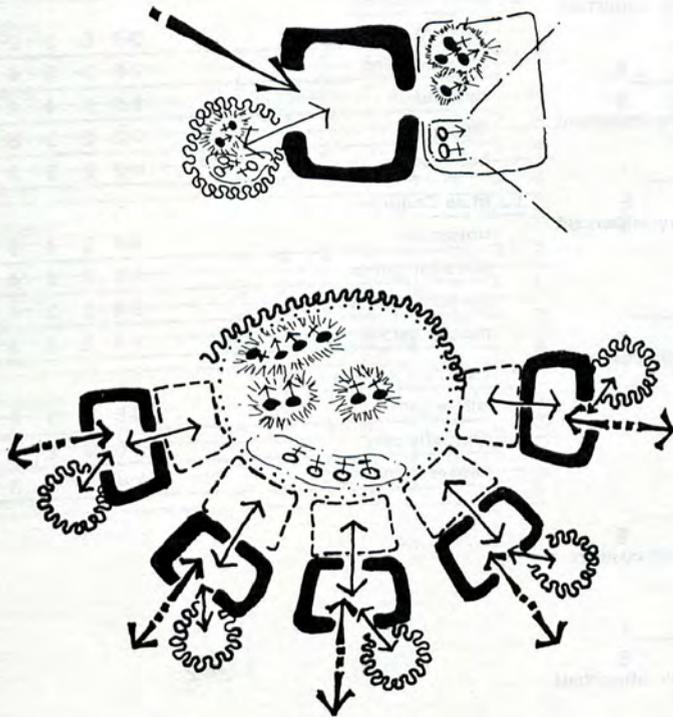
III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility					
	1	2	3	4	5	6
A. Both Adults						
partying	2-8	5	4	2	2	2
individual private relaxation	1-2	2	2	2	3	2
individual public relaxation	1-5	3	3	4	3	4
informal entertaining	1-3	4	4	2	2	2
intimate socializing	1	3	3	4	3	1
B. Male Adults						
physical sports	5-10	5	4	2	1	1
car repair	1-6	2	3	1	1	1
group socializing	1-3	4	4	3	3	2
reading	1-3	1	1	3	3	1
C. Female Adults						
washing	5-6	3	3	4	3	2
drying	1-2	2	3	3	3	2
infant care	1-2	2	2	4	3	3
infant strolling	1-4	4	4	4	3	3
gardening	1-2	2	3	2	4	1
child care	1-7	4	4	4	3	2
socializing	1-5	3	3	4	3	4
D. Both Children						
running	1-2	4	5	4	3	4
horseplay	1-2	5	5	2	4	1
physical games	2-3	5	5	3	4	3
manipulative skills	1-2	3	3	3	3	4
digging	1-2	3	4	3	5	1
bicycle riding	1-3	3	4	4	1	2
passive games	1-2	2	2	2	4	2
dramatic play	1-2	2	2	2	3	1

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 - 1. single family attached, (4-12 dwelling units per acre)
 - 2. town house (6-15 dwelling units per acre)
- B. Use of Module
 - 1. 24 foot frontage/two stories
 - 2. 24 foot frontage/one story
- C. Placement of Parking
 - 1. peripheral parking
 - 2. internal parking
- D. Building Arrangement
 - 1. linear
 - 2. centroidal

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Play Area
- F Parking
- G Immediate Neighborhood Gathering Area
- H Laundry
- I Neighborhood Play Area



FAMILIES WITH SCHOOL AGE CHILDREN / MIDDLE INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit
 : : X X : :
 0 1/2 1 1 1/2 2 2 1/2 3

2. Maximum walking distance from parking to unit
 : X X : : :
 0 100 200 300 400 500
 (in feet)

3. Number of parking spaces per grouping
 8-12

B. Public Transportation

Relative need for proximity in relation to other neighborhood
 : : X : :
 1 2 3 4 5
 min need neutral max need

C. Drop-off areas for vehicles

1. Visual access from dwelling
 X : : : :
 1 2 3 4 5
 unimportant important very important

2. Maximum walking distance
 : X X : :
 0 50 100 150 200
 (in feet)

Pedestrian

1. Unit Acoustical Privacy
 : : X : :
 1 2 3 4 5
 unimportant important very important

2. Unit Visual Privacy (privacy from pedestrian artery)
 : : : : X
 1 2 3 4 5
 unimportant important very important

3. View of Pedestrian Artery from Inside Unit
 : : : X :
 1 2 3 4 5
 unimportant important very important

EFFECTS OF NEIGHBORHOOD

Functional distance between units in interaction clusters
 : X : : :
 1 2 3 4 5
 max contact neutral min contact

Number of units per interaction cluster
 4-5 units

Functional distance between interaction clusters in the immediate neighborhood
 : : X : :
 1 2 3 4 5
 max contact neutral min contact

Number of units in immediate neighborhood
 20-25 units

Importance of neighborhood identity
 : : X : :
 1 2 3 4 5
 unimportant important very important

III. COMPATIBILITY OF ACTIVITIES

Types Compatibility
1 2 3 4 5 6 7

A. Both Adults

partying	2-7	4	4	2	2	2	4
small entertaining	1-3	4	4	2	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1
outdoor cooking	1-2	3	3	3	3	3	2

B. Male Adults

physical sports	5-10	5	4	2	1	1	4
car repair	3-5	4	4	1	1	1	3
reading	1-4	1	1	3	3	1	2
social gathering	1-3	4	4	3	3	2	3

C. Female Adults

washing	1-2	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-2	2	3	2	4	1	4
child care	2-6	4	4	4	3	2	4
socializing	1-5	3	3	4	3	4	4

D. Both Children

dancing	3-7	5	2	2	3	2	3
bicycle riding	2-6	3	3	4	1	1	4
running	1-5	5	4	4	3	4	5
digging	0-2	2	3	3	5	2	4
homework	0-2	2	2	3	3	2	2

E. Male Children

horseplay	2-4	5	4	3	4	1	5
physical games	4-5	4	3	4	3	1	5
manipulative skills	2-4	3	2	4	4	2	3
passive games	1-4	2	2	3	3	2	2

F. Female Children

active games	3-5	4	3	4	3	2	3
dramatic play	1-6	2	2	3	3	2	3
passive games	1-4	2	2	3	3	2	2

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual private relaxation	1	5	2	4	5	5	3	5
individual public relaxation	4	3	2	1	1	2	3	3
outdoor cooking	2	3	3	4	3	3	3	3
B. Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
car repair	4	3	4	3	4	4	2	3
social gathering	2	2	2	1	2	3	3	3
reading	2	4	2	2	4	4	3	4
C. Female Adults								
washing	4	2	3	4	2	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
child care	4	2	2	2	2	3	4	3
socializing	5	1	2	2	2	3	4	3
D. Both Children								
dancing	4	1	2	3	3	4	3	3
bicycle riding	5	3	3	2	2	2	5	3
running	4	3	3	2	2	3	5	3
digging	2	4	2	4	3	4	5	4
homework	2	4	4	4	4	4	3	4
E. Male Children								
horseplay	4	2	3	4	4	3	3	3
physical games	3	2	4	5	5	4	1	1
manipulative skills	2	4	4	4	4	4	5	3
passive games	2	4	3	2	4	4	4	4
F. Female Children								
active games	4	2	4	4	4	4	2	2
dramatic play	2	4	2	2	4	4	4	4
passive games	2	4	2	3	4	5	3	5

V. SUMMARY

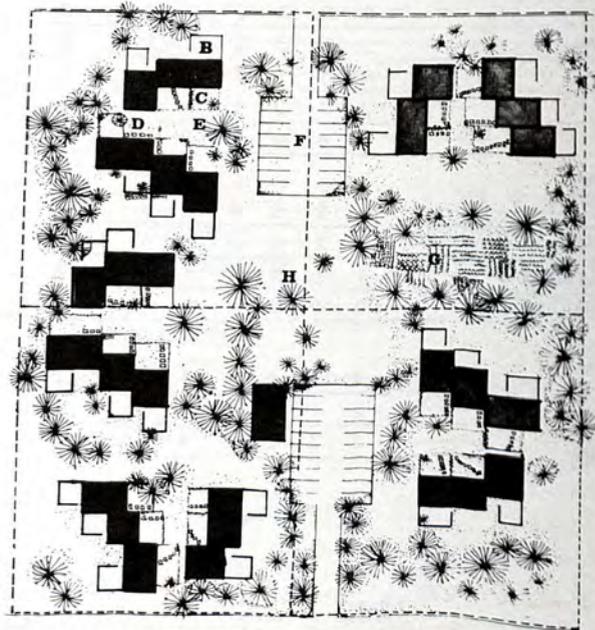
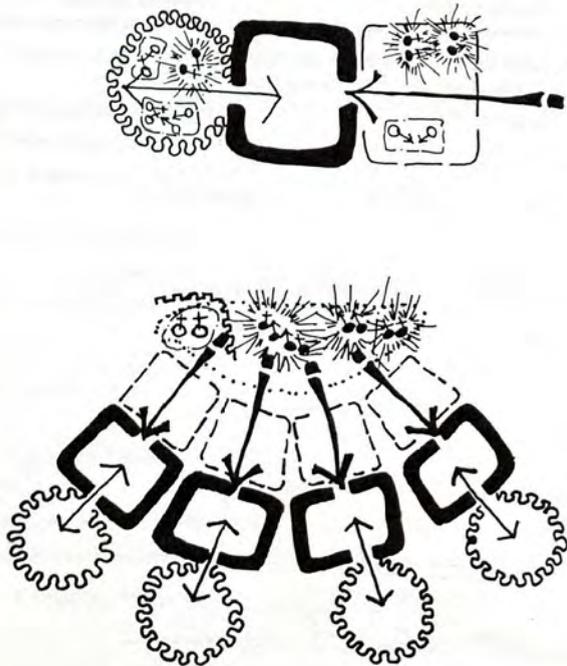
[BA=both adults; BC=both children; MA=male adults; FA=female adults; MC=male children; FC=female children]

- A. Dwelling Units: size 2 and 3 bedrooms
number of units 20-25
- B. Parking: number of spaces 36
number of groupings 2-3
size 3 groups 30x60
- C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Location Scale 5 and 6)
- | | |
|-------------------|--------------------|
| dancing—BC | partying—BA |
| bicycle riding—BC | physical sports—MA |
| physical games—MC | child care—FA |
| active games—FC | |
- D. Components for Activities Within the Interaction Clusters (Compatibility of Activities Location Scales 3 and 4)
- | | |
|------------------------|---------------------------------|
| manipulative skills—MC | dramatic play—FC |
| car repair—MA | small entertaining—BA |
| child care—FA | individual public relaxation—BA |
| digging—BC | social gathering—MA |
| passive games—MC | socializing—FA |
- E. Unit Private Yard (Compatibility of Activities Location Scales 1 and 2, and Privacy Scale 1-3)
- | | |
|-------------------------|----------------------------------|
| homework—BC | individual private relaxation—BA |
| passive games—MC&FC | gardening—FA |
| drying—FA | reading—MA |
| washing—FA | cooking outdoor—BA |
| intimate socializing—BA | small entertaining—BA |
- F. Unit Public Yard (Compatibility of Activities Location Scales 1 and 2, and Privacy Scale 4 and 5)
- | | |
|------------|------------------------|
| digging—BC | social gathering—MA&FA |
|------------|------------------------|

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 - 1. Single family, attached (4-12 dwelling units per acre)
 - 2. Townhouse (6-15 dwelling units per acre)
- B. Use of Module
 - 1. 24 foot frontage / 2-stories
 - 2. 24 foot frontage / 1-story
- C. Placement of Parking
 - 1. peripheral parking
 - 2. internal parking
- D. Building Arrangement
 - 1. linear
 - 2. centroidal

- A Dwelling Unit
- B Unit Private— Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Common Area
- F Parking
- G Immediate Neighborhood Garden
- H Neighborhood Gathering and Recreation Area
- I Laundry



FAMILIES WITH TEENAGERS / MIDDLE INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit : : : X : : :
0 1/2 1 1 1/2 2 2 1/2 3

2. Maximum walking distance : X X : : :
from parking to unit 0 100 200 300 400 500
(in feet)

3. Number of parking spaces :
per grouping 1-4

B. Public Transportation

Relative need for proximity : X : : :
in relation to other neigh- 1 2 3 4 5
bor hoods min need neutral max need

C. Drop-off areas for vehicles

1. Visual access from dwell- : X : : :
ing 1 2 3 4 5
unimportant important very important

2. Maximum walking distance : X X : : :
0 50 100 150 200
(in feet)

D. Pedestrian

1. Unit Acoustical Privacy : : : X :
1 2 3 4 5
unimportant important very important

2. Unit Visual Privacy : : : : X
(privacy from pedestrian 1 2 3 4 5
artery) unimportant important very important

3. View of Pedestrian Ar- : X : : :
tery from Inside Unit 1 2 3 4 5
unimportant important very important

II. ASPECTS OF NEIGHBORHOOD

A. Functional distance between : : X : :
units in interaction clusters 1 2 3 4 5
max contact neutral min contact

B. Number of units per inter- :
action cluster 4-5 units

C. Functional distance between : : X : :
interaction clusters in the 1 2 3 4 5
immediate neighborhood max contact neutral min contact

D. Number of units in immediate neighborhood : 25 units

E. Importance of neighborhood : : : X :
identity 1 2 3 4 5
unimportant important very important

III. COMPATIBILITY OF ACTIVITIES

Types Compatibility
1 2 3 4 5 6 7

A. Both Adults

partying	2-8	5	4	3	2	2	4
small entertaining	1-3	4	4	4	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1-2
outdoor cooking	1-3	4	4	3	3	3	3

B. Male Adults

physical sports	5-10	5	4	2	1	1	4
car repair	1-6	2	3	2	1	1	3
social gathering	1-3	4	4	3	3	2	2
reading	1-3	1	1	3	3	1	2

C. Female Adults

washing	1-2	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-2	2	3	2	4	1	4
socializing	1-5	3	3	4	3	4	4

D. Both Teenagers

dancing	5-10	5	5	3	1	3	4
intimate socializing	2-8	2	2	3	4	1	1
partying	1-8	5	4	3	3	4	4
informal socializing	1-6	4	3	4	3	3	4
homework	1-3	2	1	4	3	2	2
passive games	1-4	3	3	3	3	3	3

E. Male Teenagers

basketball	4-6	5	3	3	1	1	4
football / baseball	5-9	5	4	3	4	2	4
car repair	3-6	2	4	3	1	3	4
informal socializing	1-5	3	4	4	3	3	4
passive activities	1-4	3	4	4	3	3	3

F. Female Teenagers

spectator sports	3-8	3	3	3	3	4	4
informal socializing	1-6	3	4	4	3	4	4

QUALITY AND DETERMINANTS OF SPACE

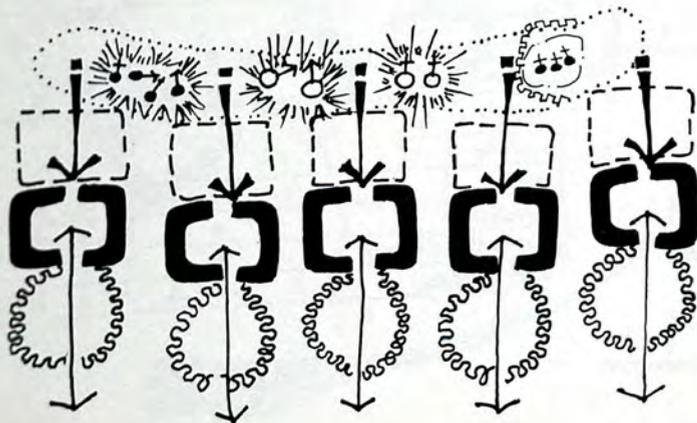
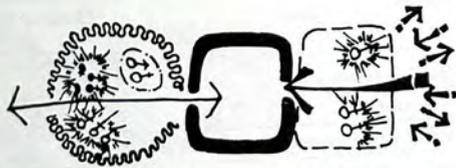
Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
Both Adults								
partying	4	1	4	2	2	4	2	3
intimate socializing	1	5	5	2	5	5	3	5
small entertaining	2	4	2	2	4	4	3	4
individual private relaxation	1	5	2	4	5	5	3	5
individual public relaxation	4	3	2	1	1	5	3	3
outdoor cooking	2	4	2	2	4	4	3	4
Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
car repair	4	3	4	3	4	4	2	3
reading	2	4	2	2	4	4	3	4
social gathering	2	2	2	1	2	3	3	3
Female Adults								
washing	4	2	3	4	4	2	2	1-2
drying	4	3	4	3	4	4	2	3
gardening	2	2	2	1	2	3	3	3
socializing	2	4	2	4	4	3	4	4
Both Teenagers								
dancing	5	1	4	2	4	4	3	3
intimate socializing	1	5	5	3	5	5	3	5
partying	5	4	4	2	4	4	3	3
informal socializing	4	3	3	2	2	3	4	4
homework	2	3	3	3	5	4	4	5
passive games	3	3	3	3	3	4	3	4
Male Teenagers								
basketball	5	2	4	4	4	4	1	3
football / baseball	5	2	4	4	4	2	2	1
car repair	4	3	4	4	4	4	3	3
informal socializing	3	3	3	2	2	3	3	4
passive activities	3	3	3	2	2	3	3	3
Female Teenagers								
spectator sports	5	1	4	3	2	3	3	2
informal socializing	3	2	2	2	2	4	4	4
babysitting	3	3	3	3	3	3	3	4
passive activities	2	4	3	2	3	4	4	4
physical sports	4	2	4	3	4	3	3	1
reading	3	2	2	2	3	3	3	3

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

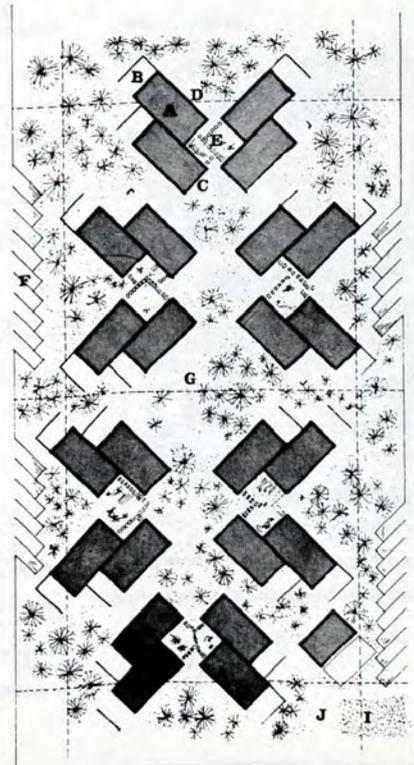
- A. Dwelling Units: size—3-5 bedrooms
no. of units—20-25
- B. Parking: no. of spaces—25-30
no. of groupings—3
size—60x50
- C. Spatial Components of Activities for the Entire Neighborhood
(Compatibility of Activities Location Scale 5 and 6)
[BA=both adults; BT=both teenagers; MA=male adults; FA=female adults
MT=male teenagers; FT=female teenagers]
 - intimate socializing—BT
 - dancing—BT
 - partying—BT
 - basketball—MT
 - football—MT
 - car repair—MT
 - dancing—FT
 - spectator sports—FT
 - partying—BA
 - physical sports—MA
 - car repair—MA
- D. Spatial Components for Activities within Interaction Clusters
(Compatibility of Activities Location Scale 3 and 4)
 - partying—BT
 - informal socializing—BT
 - passive games—BT
 - informal socializing—MT/FT
 - passive activities—MT/FT
 - babysitting—FT
 - small entertaining—BA
 - individual public relaxation—BA
 - outside cooking—BA
 - social gathering—MA
 - socializing—FA
- E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)
 - homework—BT
 - outside cooking—BA
 - individual private relaxation—BA
 - drying—FA
 - intimate socializing—BA
 - reading—MA
 - small entertaining—BA
- F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)
 - gardening—FA
 - individual public relaxation—BA
 - washing—FA
 - small entertaining—BA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 1. single family detached (3-6 dwelling units per acre)
 2. single family attached (4-12 dwelling units per acre)
- B. Use of Modules
 1. 24 foot frontage / 2-story
 2. 12 foot frontage / 1 story
- C. Placement of parking
 1. peripheral parking
 2. internal parking
- D. Building Arrangement
 1. centroidal
 2. cluster



- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Common Area
- F Cluster Parking
- G Immediate Neighborhood Gathering and Recreation Area
- H Neighborhood Laundry
- I Automobile Repair
- J Athletic Area



ELDERLY / MIDDLE INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	X	:	:	:	:
	0	1/2	1	1 1/2	2	2 1/2	3
2. Maximum walking distance from parking to unit	X	X	:	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	4-5						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	:	:	:	X
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	X	:	:	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important

II. ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact
B. Number of units per interaction cluster	4 units				
C. Functional distance between interaction clusters in the immediate neighborhood	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact
D. Number of units in immediate neighborhood	20-24 people				
E. Importance of neighborhood identity	:	:	X	:	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	3-5	4	3	2	3	4	4
small entertaining	1-3	3	3	4	3	3	3
informal socializing	1-4	3	4	4	3	3	4
gardening	1-2	2	2	4	4	2	4
passive games	1-4	2	2	4	3	3	4
outdoor cooking	1-2	3	3	4	3	3	3
B. Male Adults							
informal socializing	1-4	4	3	4	3	4	4
passive games	1-4	4	4	3	3	3	3
C. Female Adults							
washing	1-4	3	3	4	3	2	4
babysitting	1-3	4	3	3	4	4	4
informal socializing	1-3	3	3	5	3	3	4
passive games	1-3	2	2	4	3	2	3
drying	1-2	2	3	4	3	2	3

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	2	3	4	4	4	2	3
small entertaining	2	3	2	2	2	4	4	5
informal socializing	4	1	1	2	1	2	4	4
gardening	2	4	2	3	4	4	4	5
passive games	3	3	2	3	4	4	4	4
outdoor cooking	2	3	2	2	2	4	4	5
B. Female Adults								
informal socializing	5	1	2	3	2	4	4	4
passive games	3	3	2	3	4	3	4	4
C. Female Adults								
washing	3	3	2	3	4	5	4	3
drying	2	4	2	3	4	4	3	4
babysitting	4	2	2	2	2	2	4	3
informal socializing	4	2	2	2	2	2	4	4
passive games	3	3	2	3	4	3	4	4

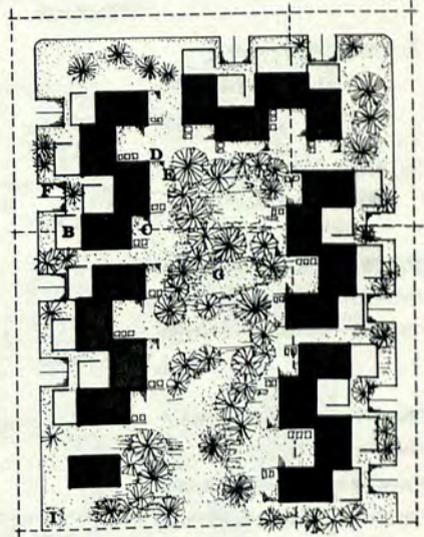
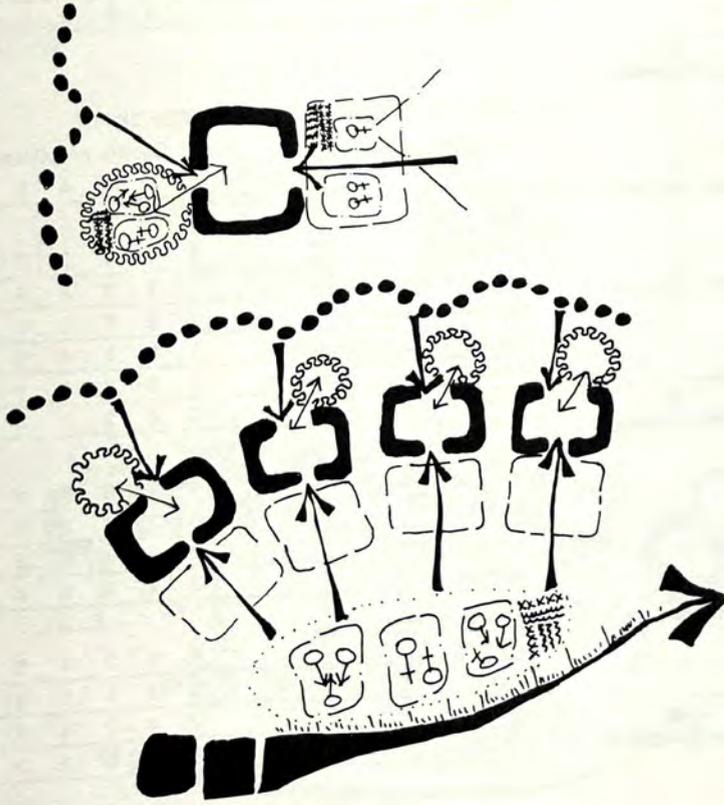
V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: size 1 and 2 bedrooms
no. of units 16-20
- B. Parking: no. of spaces 20
no. of groupings 6-10
size 4 groups 20x20
- MA=both adults; MA=male adults; FA=female adults
- C. Spatial Components of Activities for the Entire Neighborhood
(Compatibility of Activities Location Scale 5 and 6)
partying—BA
- D. Components of Activities Within Interaction Clusters
(Compatibility of Activities Location Scale 3 and 4)
partying—BA informal socializing—BA&FA
passive games—MA&FA washing—FA
- E. Unit Private Yard (Compatibility of Activities Location
Scale 1 and 2, and Privacy Scale 1-3)
drying—FA outdoor cooking—BA
small entertaining—BA
- F. Unit Public Yard (Compatibility of Activities Location
Scale 1 and 2, and Privacy Scale 4 and 5)
babysitting—FA gardening—BA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 1. Single-family, attached (4-12 dwelling units per acre)
 2. Townhouse (6-15 dwelling units per acre)
- B. Use of Module
 1. 12 foot frontage/1-story
 2. 24 foot frontage/1-story
- C. Placement of Parking
 1. peripheral parking
 2. internal parking
- D. Building Arrangement
 1. Centroidal
 2. Cluster

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Common Area
- F Cluster Parking
- G Immediate Neighborhood Gathering and Recreation Area
- H Neighborhood Center and Laundry
- I Bus Stop



MIDDLE AGE SINGLES AND COUPLES / MIDDLE INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	X	:	:	:	:
	0	1/2	1	1 1/2	2	2 1/2	3
2. Maximum walking distance from parking to unit	:	:	X	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	5						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	:	X	:	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	:	X	:	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters	:	:	:	X	:
	1	2	3	4	5
	max contact		neutral		min contact

B. Number of units per interaction cluster	5-7 units				
--	-----------	--	--	--	--

C. Functional distance between interaction clusters in the immediate neighborhood	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact

D. Number of units in immediate neighborhood	20-25 units				
--	-------------	--	--	--	--

E. Importance of neighborhood identity	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	2-10	5	5	2	2	2	4
small entertaining	1-3	5	5	2	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1-2
outdoor cooking	1-2	4	3	2	2	2	3
B. Male Adults							
physical sports	5-10	5	4	2	1	1	4
car repair	1-2	2	3	2	1	1	3
social gathering	1-4	4	4	3	3	2	2
reading	1-4	1	1	3	3	1	2
C. Female Adults							
washing	5-6	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-3	3	2	4	4	1	4
socializing	1-6	4	4	4	3	4	4

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual public relaxation	1	5	2	4	5	5	3	5
individual private relaxation	4	3	2	1	1	5	3	3
outdoor cooking	2	4	2	2	4	4	3	4
B. Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
car repair	4	2	4	3	4	4	2	3
social gathering	2	2	2	1	2	3	3	3
reading	2	4	2	2	4	4	3	4
C. Female Adults								
washing	4	2	3	4	3	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
socializing	5	1	2	2	2	3	4	3

FAMILIES WITH SCHOOL AGE CHILDREN / HIGH INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	:	X	X	:	:
	0	½	1	1½	2	2½	3
2. Maximum walking distance from parking to unit	X	X	:	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	2-6						

B. Public Transportation

Relative need for proximity in relation to other neighbor hoods	X	:	:	:	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	X	:	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	X	X	:	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters

	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact

B. Number of units per interaction cluster

2-3 units

C. Functional distance between interaction clusters in the immediate neighborhood

	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact

D. Number of units in immediate neighborhood

15-20 units

E. Importance of neighborhood identity

	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types

Compatibility
1 2 3 4 5 6 7

A. Both Adults

partying	2-6	4	4	2	2	2	4
small entertaining	1-3	4	4	4	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1
outdoor cooking	1-2	3	3	3	3	3	2

B. Male Adults

physical sports	5-10	4	4	1	1	1	4
reading	3-5	4	4	1	1	1	3
social gathering	1-4	1	1	3	3	1	2

C. Female Adults

washing	1-2	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-2	2	3	2	4	1	4
child care	2-6	4	4	4	3	2	4
socializing	1-5	3	3	4	3	4	4

D. Both Children

dancing	3-7	5	2	2	3	2	3
bicycle riding	2-6	3	3	4	1	1	4
running	1-5	5	4	4	3	4	5
digging	0-2	2	3	3	5	2	4
homework	0-2	2	2	3	3	2	2

E. Male Children

horseplay	2-4	5	4	3	4	1	5
physical games	4-5	4	3	4	3	1	5
manipulative skills	2-4	3	2	4	4	2	3
passive games	1-4	2	3	3	3	2	2

F. Female Children

active games	3-5	4	3	4	3	2	4
playing house	1-6	2	2	3	3	2	3
passive games	1-4	2	3	3	3	2	2

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual public relaxation	4	3	2	1	1	2	3	3
individual private relaxation	1	5	2	4	5	5	3	5
outdoor cooking	2	3	3	4	3	3	3	3
B. Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
social gathering	2	2	2	1	2	3	3	3
reading	2	4	2	2	4	4	3	4
C. Female Adults								
washing	4	2	3	4	3	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
child care	4	2	2	2	2	3	4	3
socializing	5	1	2	2	2	3	4	3
D. Both Children								
dancing	4	1	2	2	3	4	3	3
bicycle riding	5	3	3	2	2	2	5	3
running	4	3	3	2	2	3	5	3
digging	2	4	2	4	3	4	5	4
homework	2	4	4	4	4	4	3	4
E. Male Children								
horseplay	4	2	3	4	4	3	3	3
physical games	3	2	4	5	5	4	1	1
manipulative skills	2	4	4	4	4	4	5	3
passive games	2	4	3	2	4	4	4	4
F. Female Children								
active games	4	2	4	4	4	4	2	2
playing house	2	4	2	2	4	4	4	4
passive games	2	4	2	3	4	5	3	5

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: size 3-4 bedrooms
no. of units 15-20
- B. Parking: no. of spaces 22-35
no. of groupings 6-10
- [BA=both adults; MA=male adults; FA=female adults; BC=both children; MC=male children; FC=female children]
- C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Location Scale 5 and 6)
- | | |
|-------------------|--------------------|
| dancing—BC | bicycle riding—BC |
| physical games—MC | active games—FC |
| partying—BA | physical sports—MA |
| child care—FA | |
- D. Components of Activities Within Interaction Clusters (Compatibility of Activities Location Scale 3 and 4)
- | | |
|---------------------------------|---------------------|
| manipulative skills—MC | child care—FA |
| digging—BC | passive games—MC |
| dramatic play—FC | socializing—FA |
| individual public relaxation—BA | social gathering—MA |
- E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)
- | | |
|----------------------------------|--------------------|
| passive games—MC&FC | drying—FA |
| washing—FA | homework—BC |
| intimate socializing—BA | gardening—FA |
| individual private relaxation—BA | reading—MA |
| small entertaining—BA | outdoor cooking—BA |
- F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)
- | | |
|------------|------------------------|
| digging—BC | social gathering—MA&FA |
|------------|------------------------|

FAMILIES WITH SCHOOL AGE CHILDREN / HIGH INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit

:	:	:	X	X	:	:
0	½	1	1½	2	2½	3

2. Maximum walking distance from parking to unit

X	X	:	:	:	:
0	100	200	300	400	500
(in feet)					

3. Number of parking spaces per grouping

2-6

B. Public Transportation

Relative need for proximity in relation to other neighborhoods

X	:	:	:	:
1	2	3	4	5
min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling

X	:	:	:	:
1	2	3	4	5
unimportant		important		very important

2. Maximum walking distance

X	X	:	:	:
0	50	100	150	200
(in feet)				

D. Pedestrian

1. Unit Acoustical Privacy

:	X	:	:	:
1	2	3	4	5
unimportant		important		very important

2. Unit Visual Privacy (privacy from pedestrian artery)

:	:	:	:	X
1	2	3	4	5
unimportant		important		very important

3. View of Pedestrian Artery from Inside Unit

:	:	:	X	:
1	2	3	4	5
unimportant		important		very important

SPECTS OF NEIGHBORHOOD

1. Functional distance between units in interaction clusters

:	:	X	:	:
1	2	3	4	5
max contact		neutral		min contact

Number of units per interaction cluster

2-3 units

2. Functional distance between interaction clusters in the immediate neighborhood

:	:	X	:	:
1	2	3	4	5
max contact		neutral		min contact

Number of units in immediate neighborhood

15-20 units

3. Importance of neighborhood identity

:	:	:	:	X
1	2	3	4	5
unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	2-6	4	4	2	2	2	4
small entertaining	1-3	4	4	4	2	2	4
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-5	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1
outdoor cooking	1-2	3	3	3	3	3	2
B. Male Adults							
physical sports	5-10	4	4	1	1	1	4
reading	3-5	4	4	1	1	1	3
social gathering	1-4	1	1	3	3	1	2
C. Female Adults							
washing	1-2	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-2	2	3	2	4	1	4
child care	2-6	4	4	4	3	2	4
socializing	1-5	3	3	4	3	4	4
D. Both Children							
dancing	3-7	5	2	2	3	2	3
bicycle riding	2-6	3	3	4	1	1	4
running	1-5	5	4	4	3	4	5
digging	0-2	2	3	3	5	2	4
homework	0-2	2	2	3	3	2	2
E. Male Children							
horseplay	2-4	5	4	3	4	1	5
physical games	4-5	4	3	4	3	1	5
manipulative skills	2-4	3	2	4	4	2	3
passive games	1-4	2	3	3	3	2	2
F. Female Children							
active games	3-5	4	3	4	3	2	4
playing house	1-6	2	2	3	3	2	3
passive games	1-4	2	3	3	3	2	2

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual public relaxation	4	3	2	1	1	2	3	3
individual private relaxation	1	5	2	4	5	5	3	5
outdoor cooking	2	3	3	4	3	3	3	3
B. Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
social gathering	2	2	2	1	2	3	3	3
reading	2	4	2	2	4	4	3	4
C. Female Adults								
washing	4	2	3	4	3	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
child care	4	2	2	2	2	3	4	3
socializing	5	1	2	2	2	3	4	3
D. Both Children								
dancing	4	1	2	2	3	4	3	3
bicycle riding	5	3	3	2	2	2	5	3
running	4	3	3	2	2	3	5	3
digging	2	4	2	4	3	4	5	4
homework	2	4	4	4	4	4	3	4
E. Male Children								
horseplay	4	2	3	4	4	3	3	3
physical games	3	2	4	5	5	4	1	1
manipulative skills	2	4	4	4	4	4	5	3
passive games	2	4	3	2	4	4	4	4
F. Female Children								
active games	4	2	4	4	4	4	2	2
playing house	2	4	2	2	4	4	4	4
passive games	2	4	2	3	4	5	3	5

V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: size 3-4 bedrooms
no. of units 15-20
- B. Parking: no. of spaces 22-35
no. of groupings 6-10

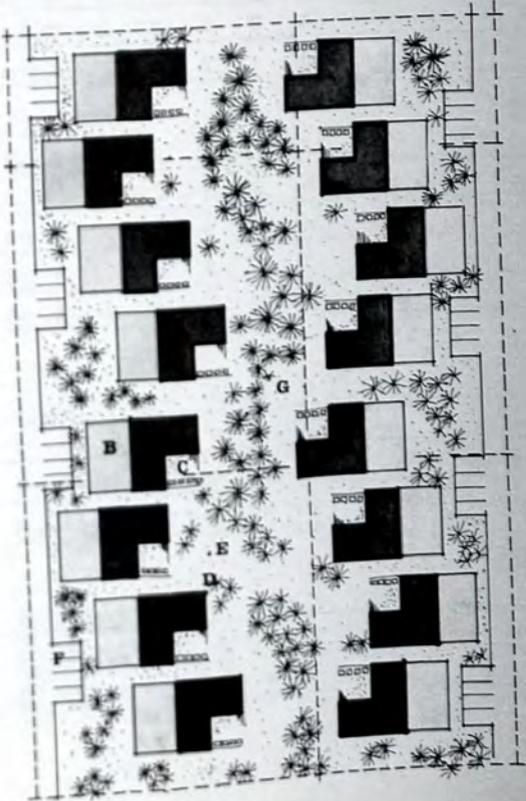
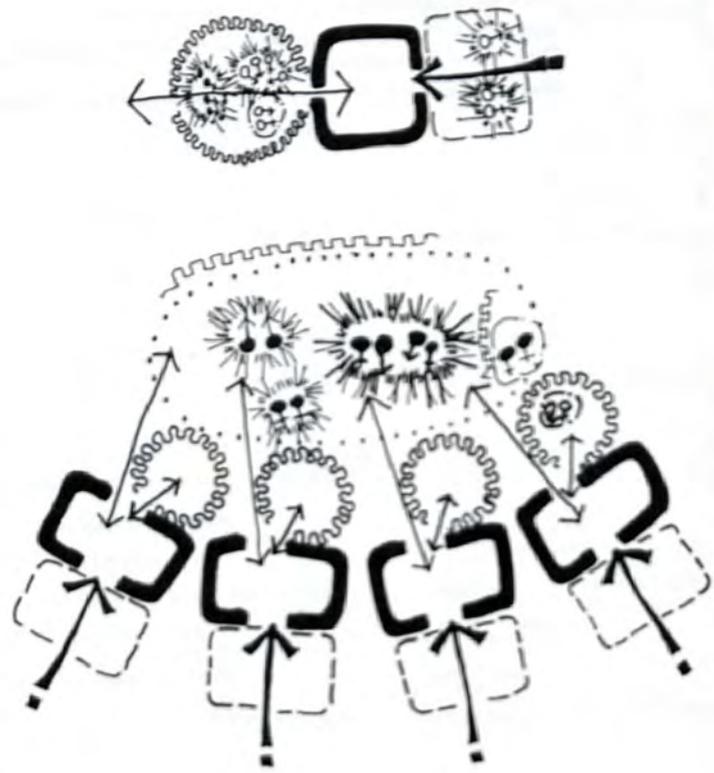
[BA=both adults; MA=male adults; FA=female adults; BC=both children; MC=male children; FC=female children]

- C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Location Scale 5 and 6)
- | | |
|-------------------|--------------------|
| dancing—BC | bicycle riding—BC |
| physical games—MC | active games—FC |
| partying—BA | physical sports—MA |
| child care—FA | |
- D. Components of Activities Within Interaction Clusters (Compatibility of Activities Location Scale 3 and 4)
- | | |
|---------------------------------|---------------------|
| manipulative skills—MC | child care—FA |
| digging—BC | passive games—MC |
| dramatic play—FC | socializing—FA |
| individual public relaxation—BA | social gathering—MA |
- E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)
- | | |
|----------------------------------|--------------------|
| passive games—MC&FC | drying—FA |
| washing—FA | homework—BC |
| intimate socializing—BA | gardening—FA |
| individual private relaxation—BA | reading—MA |
| small entertaining—BA | outdoor cooking—BA |
- F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)
- | | |
|------------|------------------------|
| digging—BC | social gathering—MA&FA |
|------------|------------------------|

IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 - 1. Single family, detached (3-6 dwelling units per acre)
 - 2. Single family, attached (4-12 dwelling units per acre)
- B. Use of Module
 - 1. 24 foot frontage / 2-story
 - 2. 24 foot frontage / 1-story
- C. Placement of Parking
 - 1. peripheral parking
 - 2. internal parking
- D. Building Arrangement
 - 1. linear
 - 2. cluster

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Cluster Recreation
- F Cluster Parking
- G Immediate Neighborhood Gathering and Recreation Area



FAMILIES WITH TEENAGERS / HIGH INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	:	X	X	:	:
	0	1/2	1	1 1/2	2	2 1/2	3
2. Maximum walking distance from parking to unit	:	X	X	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	1-10						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	X	:	:	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	:	X	X	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important

ASPECTS OF NEIGHBORHOOD

A. Functional distance between units in interaction clusters	:	:	:	:	X
	1	2	3	4	5
	max contact		neutral		min contact

B. Number of units per interaction cluster	4-5 units	
--	-----------	--

C. Functional distance between interaction clusters in the immediate neighborhood	:	:	:	X	:
	1	2	3	4	5
	max contact		neutral		min contact

D. Number of units in immediate neighborhood	20-25 units	
--	-------------	--

E. Importance of neighborhood identity	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility					
	1	2	3	4	5	6
A. Both Adults						
partying	2-6	5	4	3	3	3
small entertaining	1-3	4	4	4	2	2
intimate socializing	1	3	3	4	3	1
individual public relaxation	1-4	3	3	4	3	4
individual private relaxation	1-2	2	2	4	3	2
outdoor cooking	1-2	4	4	3	3	3
B. Male Adults						
physical sports	5-10	4	3	1	1	1
social gathering	1-3	2	3	2	1	1
reading	1-3	1	1	3	3	1
C. Female Adults						
washing	1-2	3	3	3	3	2
drying	1-2	2	3	3	3	2
gardening	1-2	2	3	2	4	1
socializing	1-4	3	3	4	3	4
D. Both Teenagers						
dancing	5-8	5	5	3	1	3
intimate socializing	1-2	2	2	3	4	1
partying	1-8	5	4	3	3	4
informal socializing	1-6	4	3	4	3	3
homework	1-2	2	1	4	3	2
passive games	1-3	3	3	3	3	3
E. Male Teenagers						
basketball	4-6	5	3	3	1	1
football-baseball	6-9	5	4	3	4	2
informal socializing	1-5	3	4	4	3	3
passive activities	1-4	3	4	4	3	3
F. Female Teenagers						
spectator sports	3-8	3	3	3	3	4
informal socializing	1-5	3	4	4	3	3
babysitting	1-2	3	3	2	3	3
passive activities	1-3	3	3	3	3	3
active sports	4-7	5	5	3	3	2
dancing	3-8	4	4	4	2	3

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual public relaxation	1	5	2	4	5	5	3	3
individual private relaxation	4	3	2	1	1	5	3	3
outdoor cooking	2	4	2	2	4	4	3	4
B. Male Adults								
physical sports	4	2	3	4	4	2	2	2
social gathering	4	3	4	3	4	4	2	3
reading	2	4	2	2	4	4	3	4
C. Female Adults								
washing	4	2	3	4	4	2	2	2
drying	4	3	4	3	4	4	2	3
gardening	2	2	2	4	2	3	3	3
socializing	2	4	2	2	4	4	3	4
D. Both Teenagers								
dancing	5	1	4	2	4	4	3	3
intimate socializing	1	5	5	3	5	5	3	5
partying	5	4	4	2	4	3	3	3
informal socializing	4	3	4	4	4	4	3	3
passive activities	3	3	3	3	3	4	3	4
homework	2	3	3	3	5	4	4	5
E. Male Teenagers								
basketball	5	2	4	4	4	4	1	3
football/baseball	5	2	4	4	4	2	2	1
informal socializing	4	3	4	4	4	4	3	3
passive activities	3	3	3	2	2	3	3	3
F. Female Teenagers								
spectators sports	5	1	4	2	2	3	3	2
informal socializing	3	2	2	2	2	4	4	4
babysitting	3	3	3	3	3	3	3	4
active sports	4	2	4	3	4	3	3	1
dancing	3	2	2	2	3	3	3	3

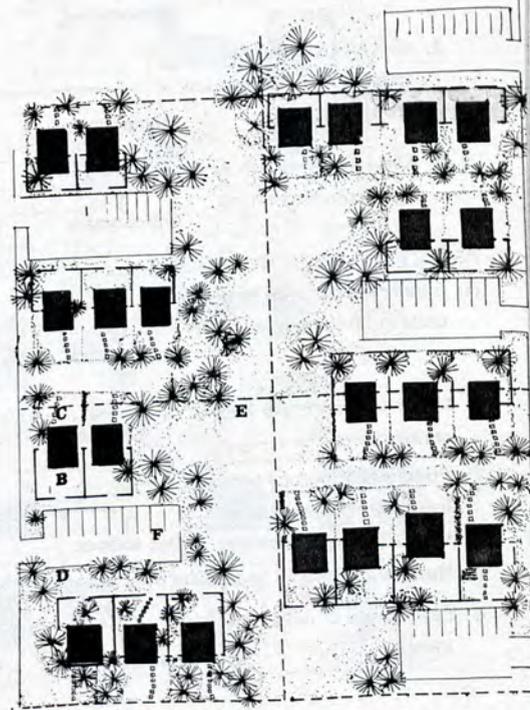
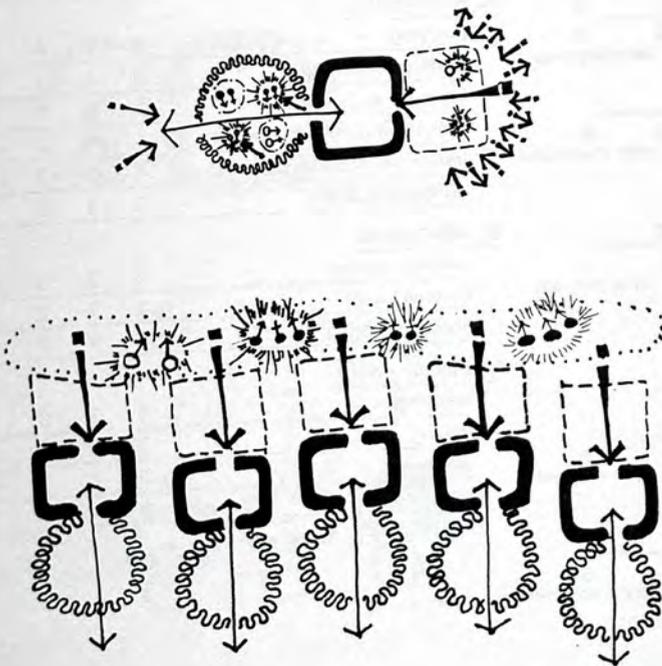
V. SUMMARY OF NEIGHBORHOOD DESIGN CRITERIA

- A. Dwelling Units: 3 and 4 bedrooms
no. of units 20-25
 - B. Parking: no. of spaces 40-50
no. of groupings 5-20
- [BA=both adults; MA=male adults; FA=female adults; BT=both teenagers; MT=male teenagers; FT= female teenagers]
- C. Spatial Components of Activities for the Entire Neighborhood (Compatibility of Activities Scale 5 and 6)
 - dancing—BT
 - partying—BT
 - football/baseball—MT
 - active sports—FT
 - partying—BA
 - intimate socializing—BT
 - basketball—MT
 - spectator sports—FT
 - dancing—FT
 - physical sports—MA
 - D. Components of Activities Within Interaction Clusters (Compatibility of Activities Location Scale 3 and 4)
 - partying—BT
 - informal socializing—BT,MT,FT
 - social gathering—MA
 - passive activities—MT&FT
 - small entertaining—BA
 - E. Unit Private Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 1-3)
 - homework—BT
 - passive activities—FT
 - individual private relaxation—BA
 - reading—MA
 - drying—FA
 - babysitting—FT
 - intimate socializing—BA
 - outdoor cooking—BA
 - washing—FA
 - F. Unit Public Yard (Compatibility of Activities Location Scale 1 and 2, and Privacy Scale 4 and 5)
 - passive activities—MT
 - individual public relaxation—BA
 - gardening—FA
 - socializing—FA

VI. IMMEDIATE NEIGHBORHOOD SCHEMATICS FOR INVESTIGATION

- A. Building Types
 - 1. Single family, detached (3-6 dwelling units per acre)
 - 2. Single family, attached (4-12 dwelling units per acre)
- B. Use of Module
 - 1. 24 foot frontage / 2-story
 - 2. 24 foot frontage / 1-story
- C. Placement of Parking
 - 1. internal parking
- D. Building Arrangement
 - 1. centroidal
 - 2. cluster

- A Dwelling Unit
- B Unit Private—Outside
- C Unit Public—Outside
- D Interaction Cluster
- E Immediate Neighborhood Gathering and Recreation Area
- F Cluster Parking



MIDDLE AGE SINGLES AND COUPLES / HIGH INCOME

NEIGHBORHOOD DESIGN CRITERIA: ACTIVITIES AFFECTING SPATIAL REQUIREMENTS

I. TRANSPORTATION FACTORS

A. Parking

1. Number of spaces per unit	:	:	X	X	:	:	:
	0	1/2	1	1 1/2	2	2 1/2	3
2. Maximum walking distance from parking to unit	:	X	X	:	:	:	:
	0	100	200	300	400	500	
			(in feet)				
3. Number of parking spaces per grouping	1-6						

B. Public Transportation

Relative need for proximity in relation to other neighborhoods	:	:	X	:	:
	1	2	3	4	5
	min need		neutral		max need

C. Drop-off areas for vehicles

1. Visual access from dwelling	X	:	:	:	:
	1	2	3	4	5
	unimportant		important		very important
2. Maximum walking distance	X	X	:	:	:
	0	50	100	150	200
			(in feet)		

D. Pedestrian

1. Unit Acoustical Privacy	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
2. Unit Visual Privacy (privacy from pedestrian artery)	:	:	:	:	X
	1	2	3	4	5
	unimportant		important		very important
3. View of Pedestrian Artery from Inside Unit	:	X	:	:	:
	1	2	3	4	5
	unimportant		important		very important

II. ASPECTS OF NEIGHBORHOOD

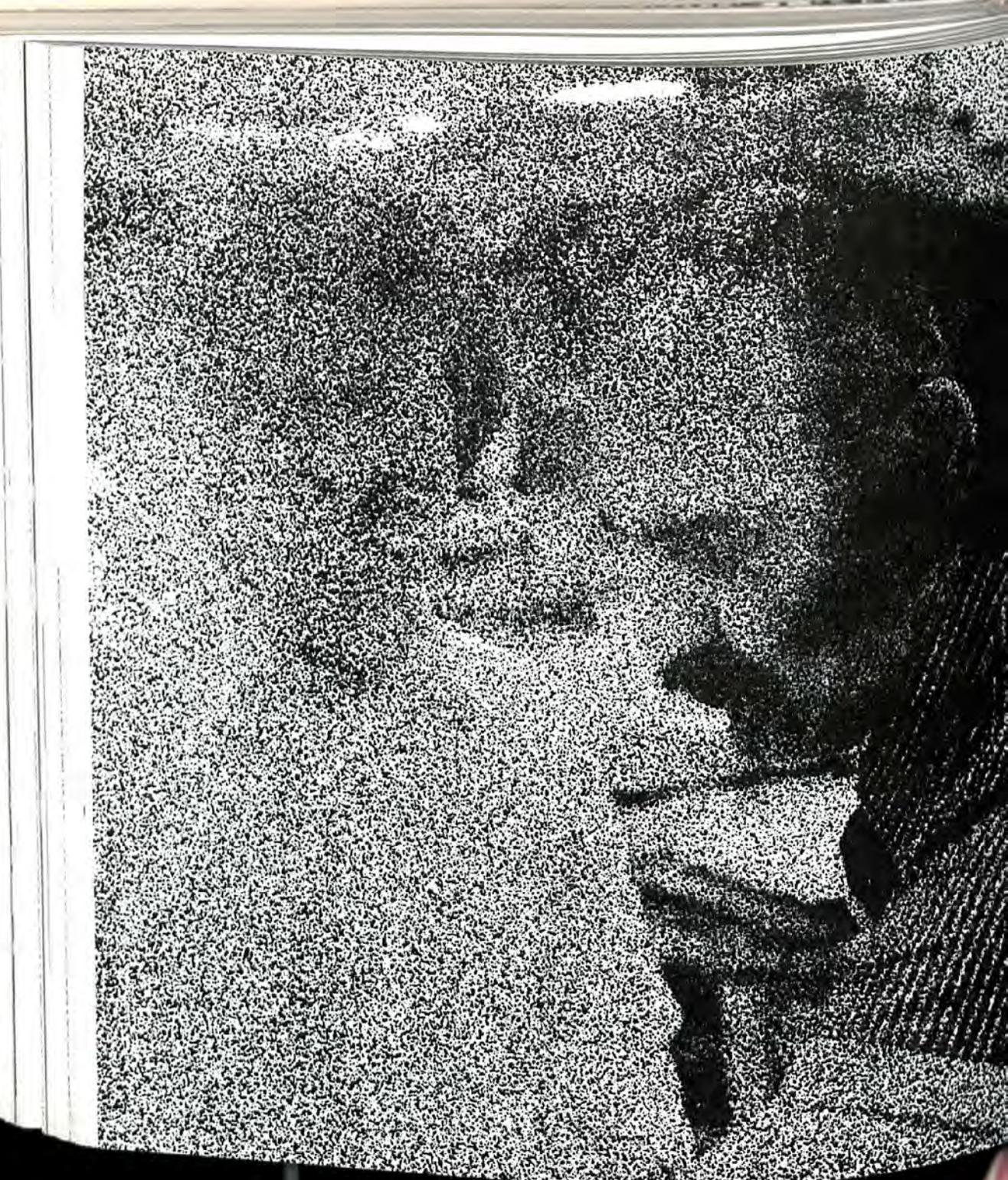
A. Functional distance between units in interaction clusters	:	:	:	X	:
	1	2	3	4	5
	max contact		neutral		min contact
B. Number of units per interaction cluster	3 units				
C. Functional distance between interaction clusters in the immediate neighborhood	:	:	X	:	:
	1	2	3	4	5
	max contact		neutral		min contact
D. Number of units in immediate neighborhood	20 units				
E. Importance of neighborhood identity	:	:	:	X	:
	1	2	3	4	5
	unimportant		important		very important

III. COMPATIBILITY OF ACTIVITIES

Types	Compatibility						
	1	2	3	4	5	6	7
A. Both Adults							
partying	2-6	4	3	3	3	2	3
small entertaining	1-3	4	4	4	3	2	2
intimate socializing	1	3	3	4	3	1	1
individual public relaxation	1-4	3	3	4	3	4	4
individual private relaxation	1-2	2	2	4	3	2	1-2
outdoor cookout	1-2	4	3	2	2	2	3
B. Male Adults							
physical sports	5-10	5	4	1	1	1	4
reading	1-4	1	1	3	3	1	2
social gathering	1-4	4	4	3	3	2	2
C. Female Adults							
washing	1-2	3	3	4	3	2	4
drying	1-2	2	3	3	3	2	3
gardening	1-3	3	2	4	4	1	4
socializing	1-6	4	4	4	3	4	4

IV. QUALITY AND DETERMINANTS OF SPACE

Types	Quality and Determinants							
	1	2	3	4	5	6	7	8
A. Both Adults								
partying	4	1	4	2	2	4	2	3
small entertaining	2	4	2	2	4	4	3	4
intimate socializing	1	5	5	2	5	5	3	5
individual public relaxation	1	5	2	4	5	5	3	5
individual private relaxation	4	3	2	1	1	5	3	3
outdoor cookout	2	4	2	2	4	4	3	4
B. Male Adults								
physical sports	4	2	3	4	4	2	2	1-2
reading	2	4	2	2	4	4	3	4
social gathering	2	2	2	1	2	3	3	3
C. Female Adults								
washing	4	2	3	4	3	4	2	4
drying	3	3	1	2	5	3	3	3
gardening	2	4	2	4	4	3	3	4
socializing	5	1	2	2	2	3	4	3



Observation of Residential Behavior Settings

Donald Kunze

Ecology is derived from a Greek word for *home* or *homeland*. Though the term promiscuously serves as a neologism for university departments of home economics and political banners, it more correctly signifies the non-experimental investigation of phenomena in place, occurring naturally and without influence of the investigators.

Such investigation has been variously employed by biologists, astronomers, and geologists but has been historically eclipsed by experimentation in the study of human behavior. Records of human maternal care, dinner conversation, or the day-long play of a child for the most part do not exist until the mechanisms and processes which effect them are thoroughly known.¹

For the past twenty years, the growing commitment to increase our knowledge of man by observing him in his natural habitat and chart the parameters of his non-psychological milieu has fostered environmental studies in every behavioral discipline; concurrent development of "information theory" has led to widespread sympathy among the professionals of these same disciplines. Though this convergence of interests and vocabularies has led to an "avalanche of speculation",² it promises eventual insight into the role of the physical world in psychological space.

The desire to establish and maintain a number of field studies has derived from a recent history of efforts to record activities, who performed them, where, and when. Psychiatric wards, nurseries, university dormitories, and libraries represent the few architecturally typical spaces to have received attention, whereas even fewer studies have examined neighborhoods, communities, or regions.³ Barker and Wright, in a 1950 study of a Kansas community, attempted to define the psychological environment of the child residents through defined "behavior settings", behavior-environment entities comprised of social and physical parts. Though Barker and Wright's

study did not seek to determine the effect on behavior of the site as a whole, its approach is attractive to investigators who care to aspire to its scale.

Working from a background of writings on topological problems by Lewin⁴ and Brunswik⁵, Barker and Wright stress that, though voluntary behavior is largely the result of the psychological habitat of the individual, certain imposed and selected elements of the non-psychological environment are perceived as appropriate to particular kinds of behavior. Sunday School, department stores, sidewalks, etc. are temporal and spatial phenomena that coerce most of their occupants to do similar things. On one side of these settings are the social and physical elements with relative characteristics, and, on the other side, is the common perception of those characteristics as appropriate to certain actions; e.g., a chair demonstrates properties of shape, size, stability, etc., but perception of these attributes may or may not be significant to the activity of sitting. Acculturation, tradition, local custom, and training are basic to appropriateness.

The challenge of ecological analysis of the environment is the discrimination of those non-psychological parts of the community, their characteristics and their structure.

Methodology

In the fall of 1969, the Community Development Group held a weekend workshop under the direction of Dr. Alan Wicker of the University of Illinois at Urbana, and Professor Henry Sanoff of the School of Design, N. C. State University. The purpose was to record observed children's activities by name, participants' characteristics, location and pertinent features of the site using maps and printed forms. The immediate strategy was to send teams in cars to nearby townships whose population was under 2000: Zebulon, Apex, Wendell, and Carrboro.

Observers made two trips to their assigned townships, one in the morning between ten and twelve o'clock and one in the afternoon between two and four. Forms were numbered and collated in sequence and arranged by township and time. Maps of the townships specifically located the observations by number.

The observers were told to describe activities as well as possible with the given limitations, record the age, sex, and race of the participants with reasonable accuracy, and define movement, arrangement of participants, boundaries, and pertinent

physical features of the site by diagrams.

Routes were to effectively cover the town at random, paths and directions were shown on the map, as well as the amount of time for each trip.

Categories of sites, activities, sex, race, uses of physical implements, and group sizes were tabulated individually for each trip, by township, by morning trips, afternoon trips, and *in toto* and expressed as a percentage.

Categories were ranked by frequency and correlation of various rankings was determined by the Spearman ranking test, revealing levels of confidence for relationships between AM and PM observations of categories for each township, summed the morning and afternoon rankings, and paired townships.

Geographical Setting

Zebulon, Wendell, Apex, and Carrboro are all townships in Wake County with a population under 3000. All except Carrboro are surrounded by farmland with sparse settlements and businesses along the highways connecting them with themselves and larger towns. The business districts typically service little more than the everyday needs of the residents and provide little entertainment to the children other than the bustle of street activity or the forbidden pleasures of a decadent movie house.

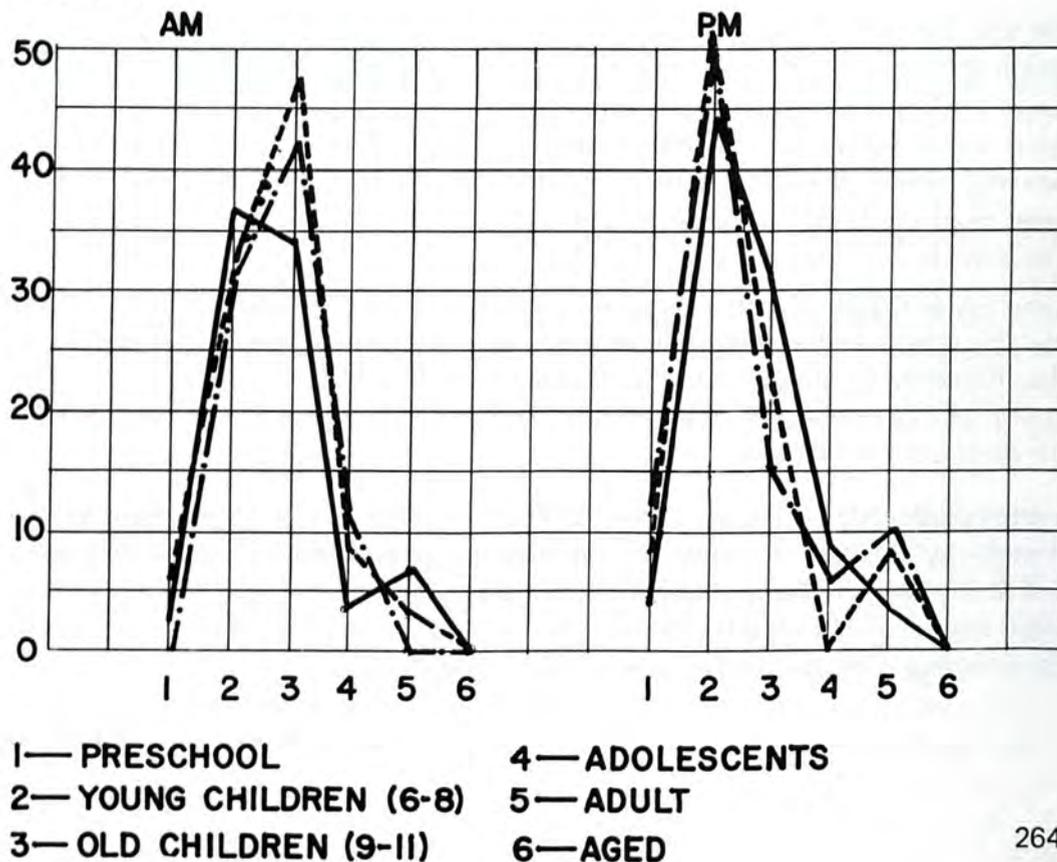
Land use is regimented and permissive. Older neighborhoods occasionally present the fine homes and azalea-gardened yards the newspapers mention but abound in the unnewsworthy modest single-family dwellings which tolerate trains, scarce traffic, or the backs of paving by local industry. Newer neighborhoods have the variation of the developer's vocabulary.

Signs occasionally announce vacant lots as one civic club's contribution to the community's recreation needs, but the majority of children find yards, sidewalks, and streets unrestrictive and convenient for play. For the most part, the surrounding fields serve as barriers and the children are committed to use of the town; the unit of the township is the unit of that group's range of settings.

Analysis of Data

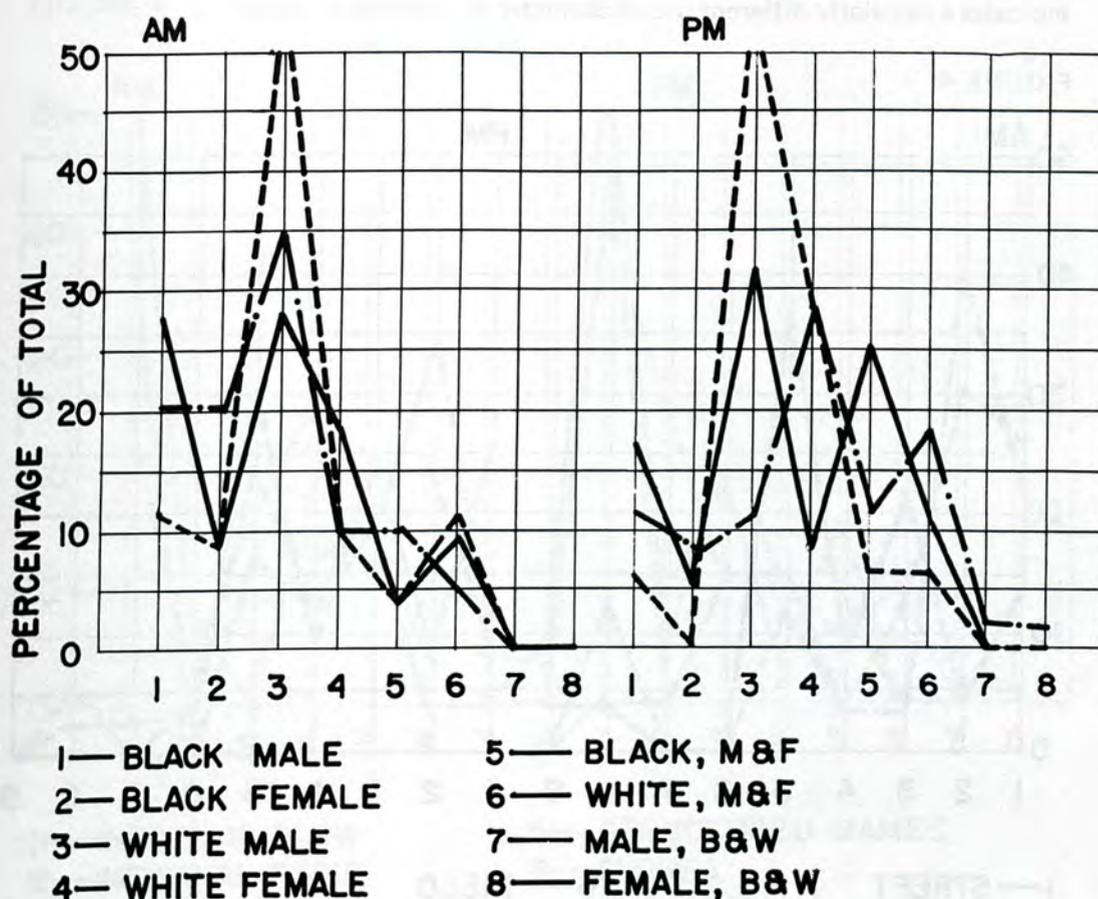
AGE. (See Figure 2) Over the three townships, the largest number of settings were manned by young children from six to eight years old; children from nine to twelve years were the next most frequently observed, but adults preceded preschool children in numbers. Adolescents appeared fairly rarely, aged adults almost not at all. This pattern was strongly demonstrated in each AM and PM township observation. Apex showed the weakest (.95 level of confidence) correlation with this pattern. Time of day seemed to have little effect on the frequencies when totaled, but townships, especially Zebulon, showed a tendency to vary in age composition with the transition to afternoon. Age patterns differed most between Apex and Zebulon, but the trend of the totaled data strongly held.

FIGURE 2



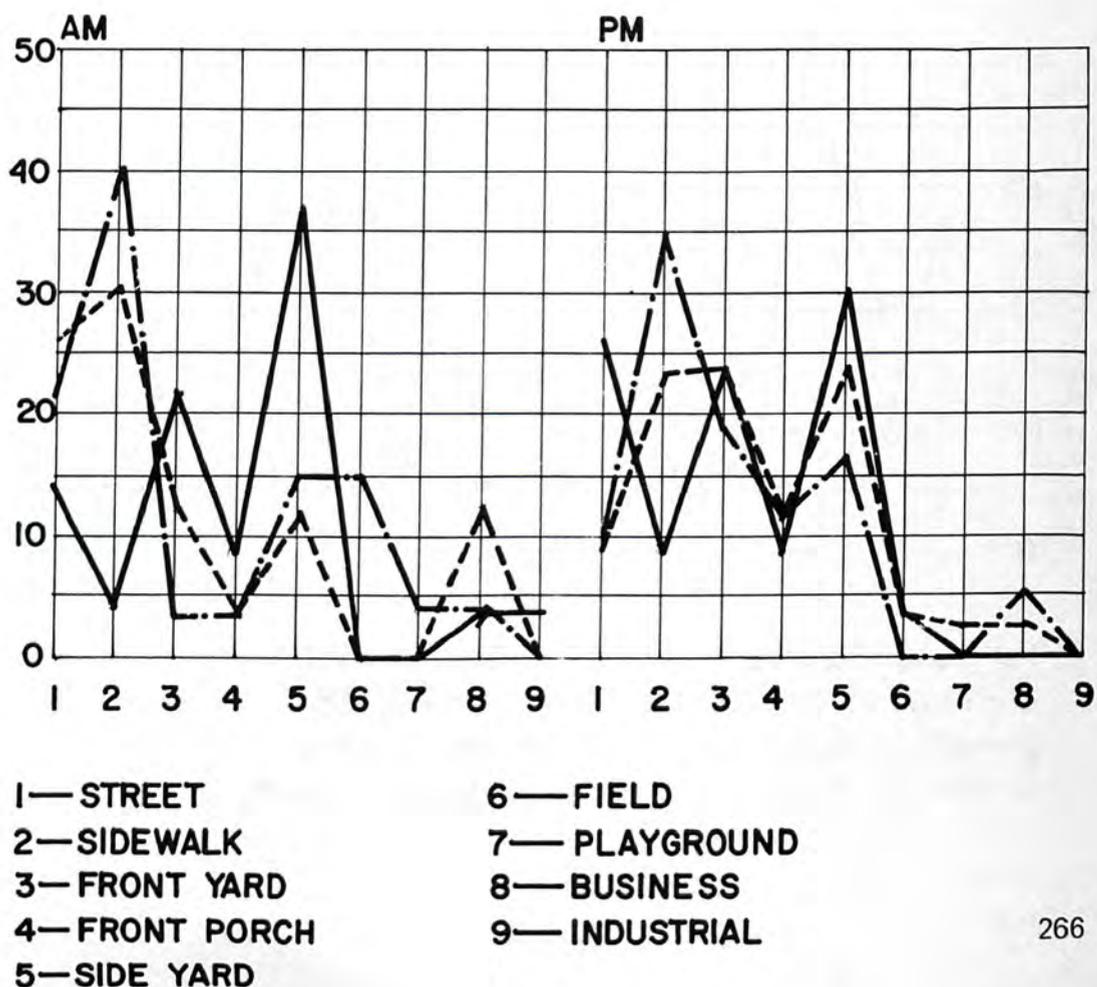
SEX/RACE. (See Figure 3) Tabulated data on sex/race characteristics demonstrated an overwhelming presence of white males. This pattern, prevalent in the morning, revised slightly in the afternoon, but mostly this was the result of shifting in categories other than "white males". Sex characteristics shifted with the time of day; Apex showed a conspicuously different pattern in the afternoon with few white females and more black groups of mixed sex.

FIGURE 3



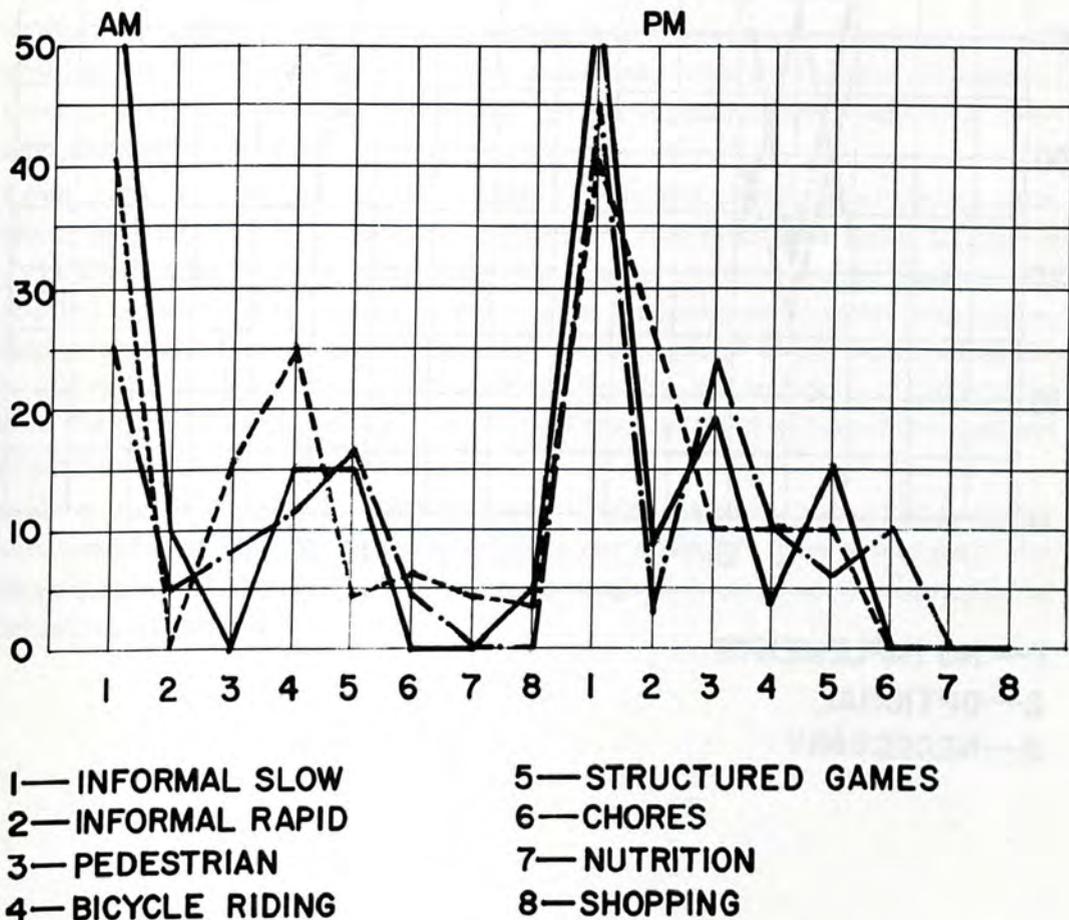
SITE. (See Figure 4) The ranking of site data *in toto* is largely due to the use of the street by the observer teams as a means of observing activities. Variations between townships on this thematic hierarchy are due to the absence or inadequacy of certain facilities near the road. Morning to afternoon variations indicate not a difference in facilities but changing patterns in play among residents. There was greater variety among townships in use of facilities in the morning, conformity prevailing in the afternoon. Again, Apex and Zebulon showed least similar patterns of land use. Apex's deviation from the accreted data's pattern was reflected in comparison between paired townships. Difference from a normally permanent pattern indicates a singularly different use or character of facilities in Apex.

FIGURE 4



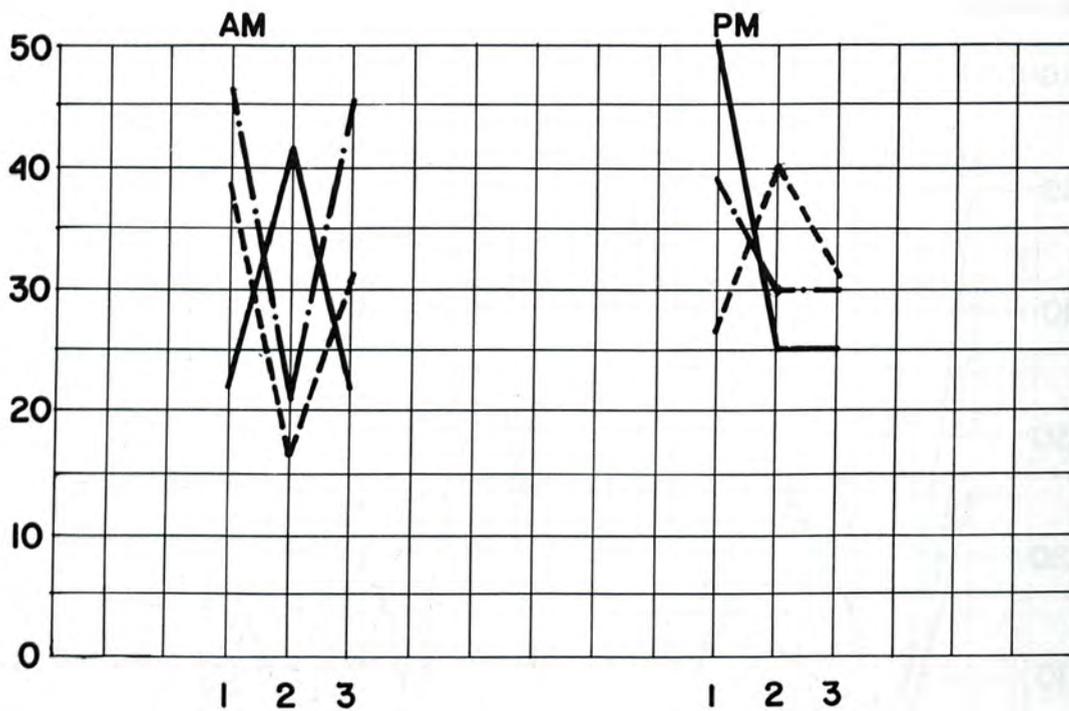
ACTIVITIES. (See Figure 5) Totals revealed a high incidence of slow, informal activities, walking, and bicycle riding, respectively, and lower incidences of structured games, informal rapid activities, chores, shipping, and eating activities. Apex lacked in morning walking activities, but conformed in the afternoon to other townships' patterns and that of totaled data. No significant change of patterns occurred with a shift to the afternoon except in Wendell, which increased in slow, informal activities and decreased in pedestrian and bike activities. Zebulon seemed to "influence" the totaled data because of the large size of its sample.

FIGURE 5



IMPLEMENTS. The difficulty of classifying use of implements into categories more specific than "no use", "optional use", and "mandatory use" prevented statistically significant comparisons of patterns.

FIGURE 6



1—NO IMPLEMENTS
2—OPTIONAL
3—NECESSARY

The value of such a short-term study is modest in comparison with the possibilities of a program of regular and continuous monitoring; it serves to distinguish the like and unlike features of similar behavioral units and preface future study.

Intuitive attempts to define the quality of space and relate it to use and preference have lately yielded to efforts to express quantitatively those attributes which attract and sustain activity. Rapoport has cited the need for urban spaces to "require some mental effort in its comprehension" and compared interest with complexity, diversity, and ambiguity of environmental elements. Sanoff, in a survey of thirty experts in research and design to determine what attributes they used to distinguish and evaluate various environments, found that likes were often described in such terms as "complexity", "stimulating", "asymmetry", "interest", and others.

A study by Krauss to link the therapeutic goals of Mental Health programs to actual physical settings in which such therapy would take place isolated the attributes of communality, sociopetality, informality, familiarity, accessibility, ambiguity, diversity, adaptability, and comfort.

From these and other sources, an attempt was made to effect a set of indices which would describe parts of the physical environment in terms of their ability to support various activities and the social potential due to location and configuration of physical elements with respect to the internal transmission of social information. Representative of an effort to "objectify" the qualities of space, these indices aim at the operational definition of complexity, diversity, and ambiguity in conjunction with the permanent elements of the physical site and social effects of their use and perception.

Such studies, it is hoped, will provide designers with the kinds of data that have long been available to agronomists, meteorologists, and ecologists. They aim to determine what goes on in designed environments through the unobtrusive monitoring of behavior in its setting.

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Residential Behavior Patterns

Gary Coates

Urban planning and design have traditionally been concerned with the locational and physical aspects of cities. This deeply imbedded emphasis by the environmental design disciplines has tended to imply that the locations and physical components of the environment are the major determinants of human behavior and of personal and social welfare. As urban life becomes increasingly complex, such rigidly imbedded and ego-centric notions about the nature of planning intervention must give way to a more dynamic concept based upon an increasingly empirical understanding of human behavior patterns and their spatial arrangements.

Planning here is interpreted to be "a method for reaching decisions," not a body of substantive goals.¹ Planning, as well as design, is a way of deciding which specific goals are to be pursued and which specific actions are to be taken. By its very nature, it is a normative (and political) process for the pursuit of goal directed activities. If this is indeed the nature of planning and design, then it is not likely that goals can be made without having an understanding of something about the causal relationships between social goals and the course of action which attempts to facilitate goal attainment. What is needed, then, is an attitude toward planning which focuses on the complex interrelationships between man and his physical, social, and psychological environments. Suzanne Keller indicates three major obligations of such an approach. First, it is necessary to understand *how* human communities operate, *why* they operate as they do, and finally, it must form opinions about how they *could best* operate. A review of the literature suggests that scientific investigations have tended to be mainly descriptive, focusing on how

communities operate. Administrators, politicians, and utopian thinkers are largely concerned with the last area, how communities could best operate. Almost entirely, however, research investigations have failed to provide planners and designers with a body of information which would benefit them in their daily decision-making needs.

It seems clear that more extensive and precise investigations into why communities (and individuals) operate the way they do is the most meaningful goal for future research. It is evident that some communities do operate in ways which are satisfactory to their residents (i.e. communities which allow free expression of individual needs). However, there seems to be a sizeable portion of our society that is forced by powers beyond its control to live under conditions demonstrably inadequate and, indeed, detrimental to their well-being and satisfaction. In the former case it is essential that these "solutions" be respected as meaningful and valid. In the latter case, however, it is most critical that changes be introduced to provide alternatives which would allow choice.²

Inevitably, interventionists are faced with the problem of legitimizing their actions. It is increasingly recognized that the ultimate judges of the success of planning and design intervention are the people for whom changes are made. The planner, then, has the social and moral obligation to optimize user satisfaction and to realize this obligation in the planning process. It is not the purpose of this paper, however, to indicate which social goals should guide planning or design intervention, for this is part of the planning process as it comes into play in each specific situation. Rather, it is intended here to propose an outline of a codification scheme, intended to provide designers and planners with a means of organizing social findings of relevance to the design of residential environments. This is a necessary first step in the ongoing process of design and research into the dynamics of the relationships between man and his physical environment. It is hoped that such a codification scheme will serve the dual purpose of structuring the existing findings relating to residential environments and of suggesting more meaningful areas for further investigations.

The Neighborhood Concept

This discussion will concentrate on a problem of concern common to sociologists and psychologists, planners, designers, and administrators, i.e. what is the relationship between human behavior patterns and their spatial arrangements in residential environments?

The investigation of residential environments has been traditionally an area of concern in the planning and design professions, appearing under the rubric of Neighborhood Theory.

The first appearance of the neighborhood unit as a planning concept seems to have been in 1923 in a paper entitled "A Community Unit in City Planning and Development," which was presented by Clarence Perry at a joint meeting of the American Sociological Society and the National Community Center Association. This idea was formulated in operational terms by Perry in 1926 for the New York Regional Plan Association. In general, this plan was an attempt to form a pedestrian area by reducing local traffic to those vehicles which actually had calls to make, and channeling through traffic along by-passes which then would form unit boundaries. Within these boundaries would be contained all of the necessary recreational and shopping facilities, with the elementary school as the focus of neighborhood activity. With roughly a quarter-mile square in area to accommodate Perry's maximum of a half-mile walk to the elementary school from the farthest dwelling, the neighborhood would contain 5,000 to 10,000 persons. With regard to the neighborhood as a social unit, Perry stated that, "When residents are brought together through the use of common recreational facilities, they come to know one another and friendly relations ensue."³ Thus, the neighborhood unit as proposed by Perry purported to give a rational ordering of the urban environment for the purpose of stimulating the common life of the area. It should also be noted that Perry stressed the importance of the neighborhood as an instrument of social control, discouraging deviance from societal norms.

When viewed with hindsight, it has become evident that the connections between spatial planning, human interaction, and political influences is far more

complicated than Perry Stein⁴ and other proponents of neighborhood planning realized. Isaacs⁵ rejected Perry's version of the neighborhood concept because of its structural inadequacies, sociological naivete, and the fact that it lent itself as an instrument for the implementation of segregation.

Stimulated by neighborhood growth and change, many explanatory theories emerged. Most prevalent among these was Hoyt's Sector Theory, which described the pattern of residential land use as sectors growing along lines of transportation with the high rent districts shaping the growth of the entire city in the same direction through the normal operation of structural ambiguity and a misleading reliance on market residential trends. Another view, put forth by Firey, stressed the role of cultural and social factors in conditioning land use. Areas, he states, have certain symbolic qualities related to the cultural system and activities are attracted to the space because of the significance of the symbol. Although such an hypothesis may provide useful insights into the study of land use and social systems, it is of relatively little value in determining patterns of residential location and growth.

In general, these explanations tend to be oversimplified. They emphasize the immediacy of facilities to the residence and they attempt to force naturally overlapping service areas into a predetermined planner's mold with little concern for the actual settlement patterns and needs of human beings. Wirth⁶ points out that

It has been found that the settlement of human beings, the patterning of social institutions, the incidence of social problems, and the intricate network of social interrelationships does not, except by accident, conform to arbitrarily delimited areas and that, hence, administrative areas only rarely coincide with the ecological or natural areas. In the study of urban life, for instance, the types of land use and the types of residential areas to be found in the city do not conform to the neat lines of precinct wards and other political and administrative boundaries. Neither do crime, disease, family disorganization, and for that matter, political alignment fit themselves into the static patterns of formally adopted area units. They have patterns of their own, and they shift in accordance with the total conditions of life.

However, the issue of whether or not to maintain local self-contained neighborhood units is still central to the planning professions. On the one hand, there are those who seek a solution to the spiritual ills of urban life in the construction of small-scale communities which attempt to "recover much that was worthwhile in the old village tradition and translate it into modern times."⁷

One of the present day proponents of this analogy between the neighborhood unit and the village is C.A. Doxiadis, who pleads for the "hidden dimensions" in the world's cities, of which the neighborhood provides one measure. He states that, "The community of the neighborhood—the local community—was a natural community," and he sees no reason why it should be taken away from man. He agrees that "additional ties are, of course, necessary," but he asks "... why should they deprive man of the natural local ties?"⁸ This suggestion of the neighborhood unit as a modern counterpart to the village of the past raises many questions and it is worthy of further discussion.

The village of the past was essentially a closed network of social control, economic dependencies, limited social and physical mobility, and extended kinship families, within an essentially well defined physical boundary (with concomitant sentimental attachments to the geographical "territory"). Social control occurred through primary group relationships and was enforced by the threat of painful social and/or economic ostracism. Kin and neighbors served what are now largely institutional functions, such as child care, health care, financial assistance, group recreation, and so on. The degree of neighborhood cohesion in this sense was directly related to the degree to which a given neighborhood encompassed its composite characteristics.

If this is indeed the nature of the neighborhood village model for which Doxiadis and others argue, there is strong evidence to indicate that the revival of such units is not only impossible, but in fact, undesirable in contemporary cities. Catherine Bauer summarizes the opposition to the neighborhood principle when she describes the idea as "reactionary in effect and sentimental in concept," ignoring the trends in modern society which are "away from the

localized 'in-groups' and small parochial communities."⁹

In fact, it has been observed by many students of urban problems, that the processes of urbanization and technological development have essentially broken the link between the physical neighborhood and its satisfaction of the personal, familial, and societal needs of the urban dweller. As a result of increasing physical and social mobility, there is an emerging pattern of non-territorial primary and secondary group associations, an institutionalization of neighborhood services, and the creation of broader societal reference groups. As a result, modern man has gained a greater range of alternatives from which to fulfill his needs. (There is evidence, also, that he may have achieved a certain amount of anonymity and isolation in return.).

What then, is the definition of the term neighborhood as it will be used in this paper, and what is the position taken concerning the relevance of this concept to environmental design and research? Essentially, the term neighborhood refers to distinctive areas into which larger spatial units may be subdivided.¹⁰ This distinctive quality is derived from various sources whose individual contributions and independence is different with each given situation. These sources are: "Geographical boundaries, ethnic or cultural characteristics of the inhabitants, psychological unity among people who feel that they belong together, or concentrated use of an area's facilities for shopping, leisure, and learning." It seems evident that the above sources of area distinction often define different neighborhood boundaries for different residents at different stages in their lives.

If the physical setting is not merely perceived of as a place where certain forms of interaction occur, but, rather, the physical setting, as well as the persons in it, are seen as participants in a complex and ever-changing interaction¹¹ it is a moot point whether or not the physical setting of such an interaction is labeled a neighborhood or not. What is of interest is the nature and dynamics of the interaction of individuals and groups with their residential environment. We are interested in the concept of neighborhood primarily as it exists as a mental image for the residents of areas under investigation.

The following statement by Herbert Gans¹² summarizes the position taken in this paper concerning the relationship between the physical, social and psychological environments of man.

The physical environment is relevant to behavior insofar as this environment affects the social system and culture of the people involved or as it is taken up into their social system. Between the physical environment and empirically observable human behavior, there exists a social system and a set of cultural norms which define and evaluate portions of the physical environment relevant to the lives of the people involved and structure the way people will use (and react to) this environment in their daily lives.

Codification Scheme

In order to either study or record environment-behavior relations it is necessary to be able to record and measure each class of phenomena independently of each other. This becomes necessary because the physical environment represents an entirely different class of phenomena and can only be investigated and understood independently of the behavior with which it is related. Our purpose in descriptively separating behavior from its environmental setting is to understand behavior as a part of a larger space-time context than can be grasped by studying the momentary phenomenon of any given environment-behavior context.

The following figure (Fig.1) illustrates the major categories of residential environment and behavior information and their relationships.

Environment

The major environmental attributes to be considered in this codification scheme at each scale of residential environment are boundary conditions, spatial proximity, form, and paths.

1. *Boundary Conditions:* Spaces at any scale are enclosed to some extent by a variety of space establishing elements. A boundary condition describes the nature and extent of spatial enclosure afforded by surfaces, screens and objects.¹³ For example, at the intra-dwelling

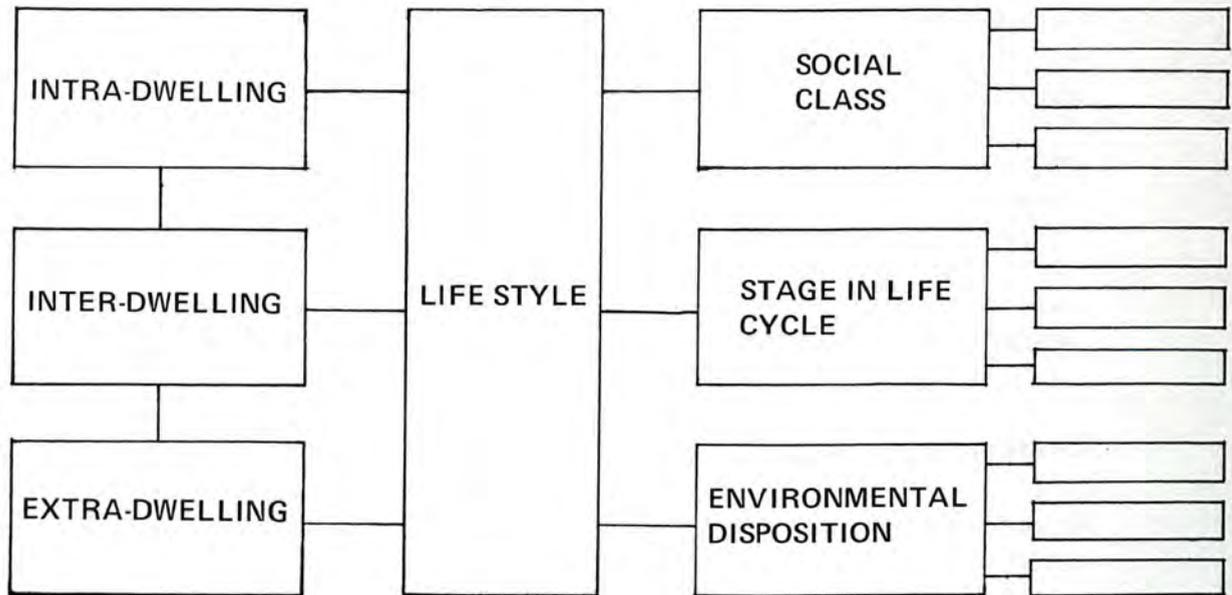


FIGURE 1

scale, the living space boundary conditions may be four side surfaces (two external and two internal walls), one over-surface (ceiling) and one under-surface (floor). These surfaces can be both qualitatively and quantitatively described according to the following dimensions: position (over, under, side); size, direction, number, shape, color, texture, and light quality.¹⁴ Similarly, at the inter-dwelling scale, private open space boundary conditions may be three side screens (three redwood fences) and one side surface (the house), one over surface (sky), and one under surface (grassed lawn). Boundary conditions both enclose spaces and separate one space from another.

2. *Spatial Proximity*: Spatial proximity refers to the relationship of elements enclosed by various boundary elements. The elements existing within spatial volumes may be described according to position, size, shape, direction, color, texture, and light quality. The concept of spatial proximity raises the issue of the simultaneity of size and space.¹⁵ That is, a given space may be bounded primarily by objects (i.e., furniture in a living space of a house), which is contained in another volume bounded by surfaces (i.e., walls, ceiling and floor of the same living space). The relative ambiguity of spatial proximity descriptions can be resolved by more precise scale designations.

3. *Form*: When space establishing elements (surfaces, screens, and objects in their over, side and under positions) are combined, they define spatial forms. Depending upon scale, spatial may be described as objects or volumes. For example, at the intra-dwelling scale, the relevant category for describing the spatial form of a dwelling may be as a cluster of related spatial volumes. However, at the inter-dwelling scale, the same dwelling may be described as a spatial form or object. Both spatial volumes and spatial forms may be described in terms of position, size, direction, number, shape, light quality and scale.

4. *Paths*: A path is the general term which refers to the nature and extent of links existing between one spatial volume and another. The critical concept operating with regard to the term path is that every human activity is in some way separated¹⁶ from every other activity. Boundary elements physically separate spaces and activities. Paths are the connecting elements just as surfaces, screens, and objects are the separating elements. Paths may be described according to their ability to separate activities and spaces according to the following dimensions: Accessibility, (with regard to time, distance, visual access or contact, auditory contact, and olfactory contact). Thus, at the intra-dwelling scale, a stairway may be a path in the vertical direction separating the living space from the sleeping space. Paths may be subject to various degrees of control (such as one way streets, locked doors, and so on).

Behavior

The following categories of behavior information appear to be related to an understanding of the interaction between man and his residential environments.

Life Style As used here, the term life-style refers to the composite set of behavior characteristics of groups and individuals which are of relevance to the physical characteristics of residential environments. The specific behavior characteristics to be considered are subsumed under the headings: Social Class, Stage in Life-Cycle, and Environmental Disposition.

Social Class Social class is generally power, prestige, respect, and honor a person achieves through his occupation, education, income, and housing and neighborhood condition. The categories of social class that seem to be useful are listed below:¹⁷

1. *Lower Class*: low income; often no steady job or one subject to the discretion of the employer; little education.

2. *Working Class*: Regular blue-collar employment.
3. *Lower Middle Class*: Regular white-collar employment, usually for others: moderate salary.
4. *Upper Middle Class*: High amount of education; comfortable salary or fees; sometimes self employed but skills are transferable regardless.
5. *Upper Class*: Great personal wealth either at present or within the family at some past date at least moderate education; occupation, if any, is respectable.

The following list indicates some classes of measureable phenomena relevant to identifying a person's social class according to the class categories listed above:

1. Demographic Information:
 - a. income
 - b. occupation
 - c. education
2. Organizational Membership:
 - a. territorial
 - b. non-territorial

Existing literature indicates that an individual's actual and perceived social class is, indeed, relevant to aspects of the physical environment. This is especially true with regard to the socially prescribed neighbor role relationship.

Keller¹⁸ states that when, "middle class families find themselves side by side with those they consider inferior, they either join community associations in search for more congenial company or they strive to leave the community as soon as possible." The group which is perceived to be of inferior social status becomes resentful toward any presumption of higher status and either withdraws or becomes overtly hostile. This seems to be a representative pattern whenever there is an assertion of exclusiveness based upon social status. Based upon an extensive review of literature Keller¹⁹ suggests that, "the amount, the extent, the intensity as well as the occasions for neighboring seem to reflect social class."

Since both the "external physical and social arrangements"¹⁹ in residential areas are sustained to some extent by neighbor role expectations it is important to determine the definition and significance of the neighbor role for any group under study. The following list illustrates the type of information needed to understand the neighbor role:

1. Priority of neighbors in the network of social relationships
 - a. priority of friends
 - b. priority of relatives
2. Formality of rules governing neighbor relations
3. Frequency of neighborly contacts
4. Extent of neighborly contacts
5. Intensity of neighborly relations²¹

Stage in Life-Cycle Mann²² introduces the concept of stage in the family life-cycle as a functional "type of approach" for determining groups that have common ties binding them to each other and their proxemic neighborhoods. Michelson²³ is among the more recent advocates of the relevancy of this concept to the physical environment. He lists three categories of stage in the life-cycle that appear to have direct implications for the physical environment:

1. Child Raisers: Michelson²⁴ suggests that aspects of child raising are particularly relevant to at least two aspects of the environment:

(a) *Ease of Access to Outdoor Space.* Many studies have shown that most families feel a strong need to supervise children's play activities. If access to play areas is difficult and hazardous, parents will not have adequate supervision time whenever their children wish to play. Consequently, the environment is capable of introducing more stress into the child raising aspect of family life. Measureable categories of information relevant to Ease of Access to Outdoor Space include:

- (1) Family Solidarity Attitudes (Attitudes toward control and discipline of children.
- (2) Leisure Attitudes.

(b) *The Amount of Separation From Adjacent Neighbors.* A significant cause of dissatisfaction with multi-family housing stems from the restrictions families feel about making noise and disturbing other families. This perceived restriction is of course accentuated for families with children. It is thus important to determine information relating to family privacy attitudes, family leisure patterns, and so on.

2) The Old and Young Childless: Charles Abrams²⁵ is among those who have indicated that adults, both before and after raising children, tend to be oriented toward consumer goods and services, and thus, rate access to city centers more highly than do child raising families.

Consequently, information pertaining to locational preferences, urban orientation, and so on would begin to probe this aspect of the needs of childless couples with regard to the physical environment.

3) *The Elderly*: It has been stressed in most studies of the elderly that loneliness and social isolation are two very significant contributors to dissatisfaction with housing. There is some evidence that the elderly have the dual needs of being around like-aged people and also of having easy access to lively activity. Information (such as the above) about the special problems and needs of the elderly has obvious implications for the location and design of housing.

Environmental Disposition Information about a person's orientations toward and attitudes about the physical environment (as opposed to his orientations to and attitudes about other people, for example) are described by Craik²⁶ as "environmentally prevalent dispositions." Although there has been very little research in this area, Craik suggests two possible areas of investigation:

1. *The assessment of persons in terms of their enduring orientations to the non-human environment*: The assumption is that people display enduring orientations toward both the natural and the man-influenced physical environment. It should then be possible to identify and measure these orientations. Applying this concept to the residential environment it is possible to suggest two approaches to environmental research:

(a) Every individual has certain beliefs about environmental issues. For example, it is possible to assess people according to their beliefs about such issues as forced housing relocation, high density housing, public and private open space, and so on. The hope would be that such investigations would begin to separate groups for purposes of identification. Craik refers to these patterns as "*Belief Patterns*."

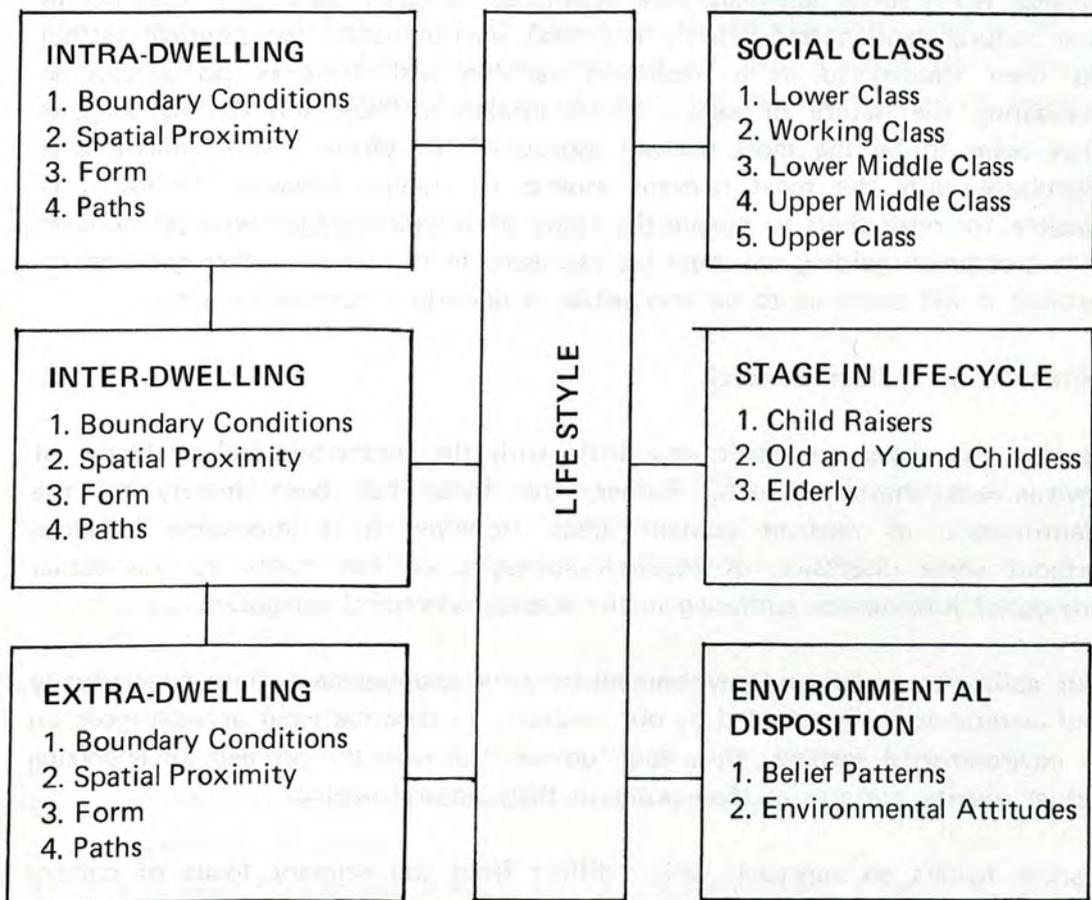
b) A recurring theme in American culture is the aversion to the urban environment and an attachment to the idyllic rural environment. (See White and White, *The Intellectual Versus the City*, Cambridge, Mass., Harvard University Press & MIT Press, 1962). Frank Lloyd Wright was a leading advocate of the intellectual versus the city, and this attitude colored his approach to both architecture and city planning. Craik suggests that it is possible to describe an individual's attitudinal network as ranging from pastoral to urban-technological. This would be the basis of an "*Environmental Attitude Scale*."

Keller²⁷ points out that rural-urban traditions of neighboring account for variations in neighboring behavior. At one end of the continuum, the rural, the predominant pattern of

neighboring is more "solidary" and "integrative" and is very much a part of a network of many other social relationships. At the other end of the scale, one sees the "segmentalized, personalized, and sociable" type of neighboring behavior. Such information has strong implications about intra-dwelling layout, inter-dwelling paths and boundary conditions, and the paths to extra-dwelling spaces and activities (clubs, shops, community centers).

The following topical outline (Fig. 2) summarizes the preceding description of a residential codification scheme.

FIGURE 2



It should be obvious that this codification scheme is in no way complete, in either content or structure. It is merely suggestive, at this point, of the types of information and relationships which are necessary to make research into residential environments more relevant to design and planning decisions.

At present there are no studies which have dealt with all of the content areas illustrated in the codification outline. Up until recent years, behavioral scientists have not been primarily concerned with the study of human behavior in its environmental context. Most psychological investigations have been concerned with studying human response to specific stimuli in controlled experimental settings. When social scientists have attempted to study behavioral responses in their natural (and extraordinarily complex) environments, the physical setting has been alluded to as a mediating variable with little or no success at elucidating the nature or extent of its influence. Thus, this outline suggests what seem to be the most relevant aspects of the physical environment as it articulates with the most relevant aspects of human behavior. Unless it is possible for researchers to pursue the study of environment-behavior phenomena with a common guiding paradigm (as expressed in this or any other codification outline) it will continue to be impossible to develop a cumulative science.

Directions of Further Research

So far this paper has dealt very little with the methodological problems of environment-behavior studies. Rather, the focus has been merely on the identification of relevant content areas. However, it is impossible to close without some discussion of research strategies as they relate to the actual process of information gathering in the already identified categories.

Our ability to understand environment-behavior phenomena is both conceptually and methodologically crippled by our inability to describe what actually goes on in environmental settings. How then do we deal with the problem of analyzing actual activity patterns as they occur in their natural setting?

Barker fosters an approach which differs from the primary focus of current psychological research and offers great promise as a means of establishing more

specific behavioral criteria for the design of the physical environment. Briefly, Barker advocates the unobtrusive observation of behavior in natural settings to gain ecologically valid descriptions. By so studying behavioral events in their psychologist-free settings, it becomes possible to determine the spatial properties of behavior.

To date, the ecological approach has yielded information about what goes on in libraries,²⁷ psychiatric wards,²⁸ nurseries,²⁹ and university dormitories.³⁰ The relative success of these ecological studies as well as the inherent attractions of the ecological approach suggest its application to the study of behavior in residential environments. The initial contribution of the ecological approach to the residential environment would simply be to describe what does go on. In the process, it should be anticipated that we will gain a much more concrete and increasingly sophisticated means of describing the ways in which behavior articulates with the environment.

Gary Coates

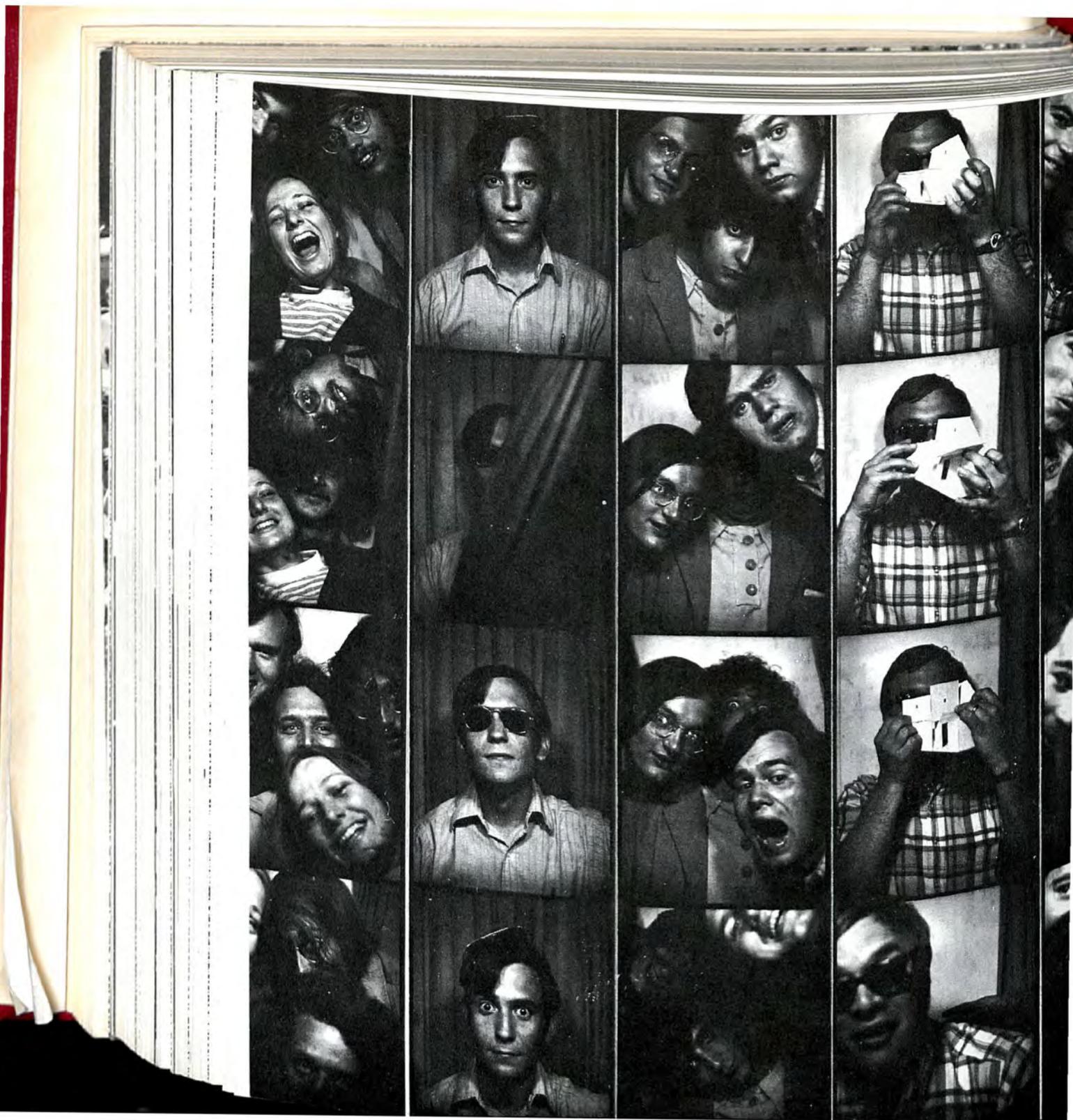
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