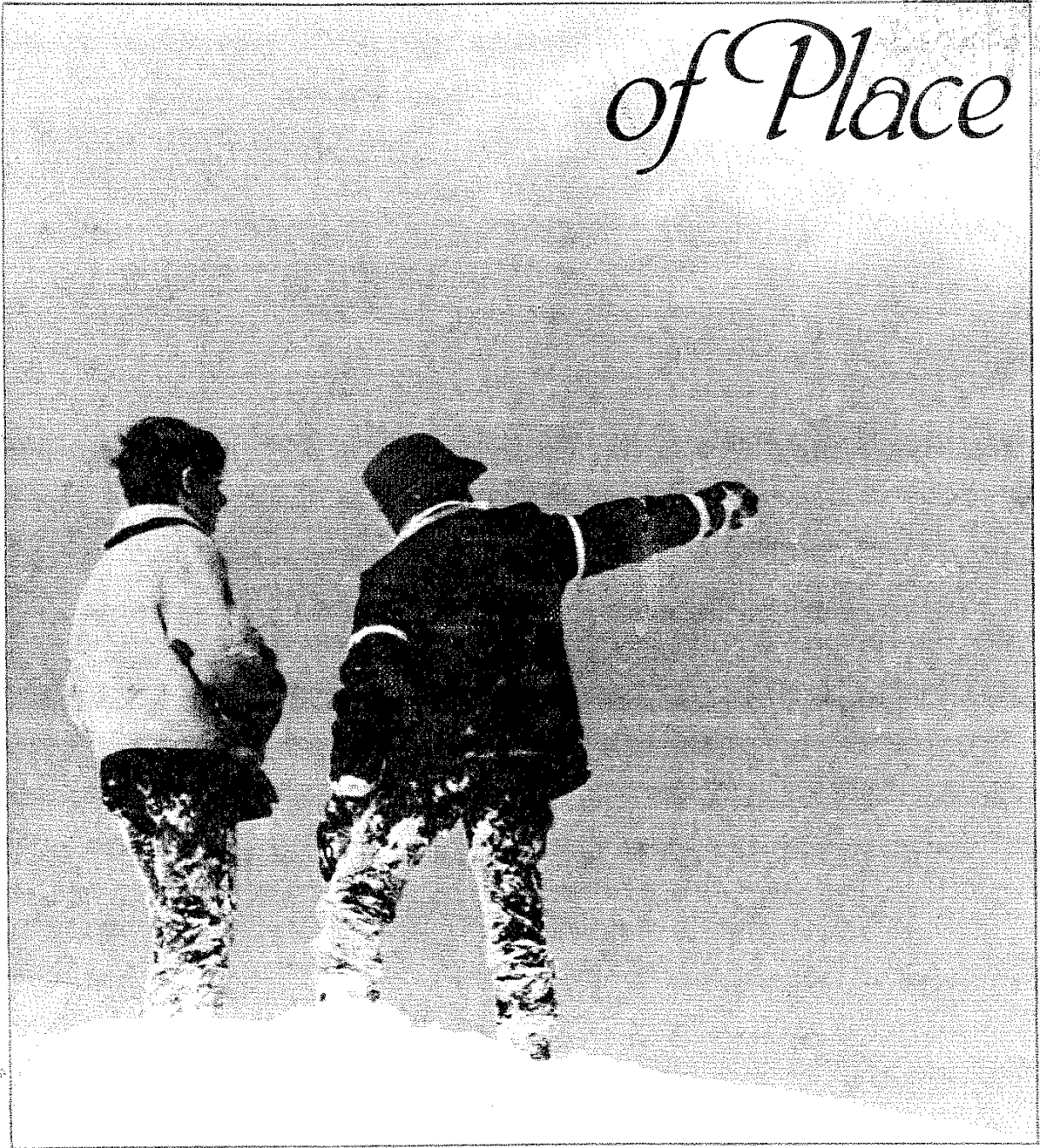


*Children's Experience
of Place*



Roger Hart

CHILDREN'S EXPERIENCE OF PLACE

Roger Hart

*Environmental Psychology Program
City University of New York*

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"It is not alone the desire to try and use [their] power that prompts [children] at this age to seek adventure high and low, far and wide; it is particularly the peculiarity and need of [their] innermost lives, the desire to control the diversity of things, to see individual things in their connection with a whole, especially to bring near that which is remote, to comprehend (the outer world) in its extent, its diversity, its integrity; it is the desire to extend his scope step by step . . ."

Freidrich Froebel, The Education of Man, 1826.

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To mum and dad for giving me a
childhood with great freedom to
explore and learn while making
yourselves, your understanding
and affection available to me at
all times.

PREFACE

In this lengthy, multifaceted and financially constrained investigation, there are dozens of persons I feel a strong desire to thank. I will try to remember them. For the sake of clarity, they are described chronologically--as they entered my life.

My parents laid the ground for my concern with children and their environments. They gave me the kind of childhood I feel all children should have--offering great freedom to explore and learn, clearly expressing limits, yet making themselves, their understanding and affection available to me at all times. Years after, an extraordinarily original and open-minded couple of professors at Clark University provided the particular circumstances for my pursuit of this research. I am speaking of James Blaut, cultural geographer-cum anthropologist/philosopher and David Stea, psychologist-cum geographer/designer; both were willing to throw out germs of ideas without wishing to personally harvest the result or collect interest. Although working under them as a research assistant in geographic learning and education in the Place Perception Project, they shared with me as a colleague all their insights and hopes for exploring the unknown realms of geographic learning.

Growing out of the work of the Place Perception Project, I was extremely fortunate to share two wonderful years of thinking, organizing and writing with Gary Moore. During the period, this study was conceived and partially formulated. Gary was responsible not only for the stimulation of dozens of late-night discussions, but also for my realization of the great values of collaborative work. During the same period, we formed the loosely organized "Environmental Cognition Workshop" together with Dennis Wood and David Seamon, which offered an excuse for me to tap the talents of a very innovative group of people. Dennis continued throughout the early stages of the study to offer needed support for all that seemed at the time intuitively right but academically innovative. I am thankful for this and for the various methodological injections he undoubtedly made into the study. David Seamon remained as a most valuable supporter and critical commentator through to the closing stages of the study. Robert Beck, also at Clark University in the formative stage of the study, provided valuable assistance through his willingness to discuss with me a great range of methodological possibilities, again with impressive originality. He remained as a supportive adviser throughout the conduct of the study, with great distance being the only constraint upon more direct involvement.

I am most appreciative that Professors Duane Knoss and Saul Cohen became my major advisers when James Blaut and David Stea were no longer resident and able to assist with discussion of the week-to-week problems of conducting a study. They were always extremely generous with their time and open-minded, yet frequently firm regarding the practical limits of a dissertation and of the need to get it completed!

My dear friend David McCaulay was of the greatest personal strength for me during the conduct of the research. He made himself always available

to share my thoughts and problems, but even more important was his emotional support in dealing with personal problems and doubts affecting the study.

Harold Proshansky, environmental psychologist at the City University of New York, supported my work at a most crucial phase. I had visited the field location and had begun to experiment with various methodologies, but was unsure about so many things. He was extraordinarily generous with his time and worked hard to convince me of the value of pursuing my own methodological ideas and theoretical insights in the face of a largely irrelevant existing literature. He had an immediate grasp of my goal and encouraged me at every opportunity throughout the investigation.

Nick Thompson, psychologist/ethologist at Clark University, also offered valuable methodological assistance. By repeatedly asking root questions and challenging my assumptions, he was able to play a truly catalytic role in the development of my research design. I am only sorry I could not carry out the careful micro-ecological studies of children-in-environments which his vision encompassed.

Clair Reiniger worked with me during the difficult period of diary-keeping. She claimed she wanted to learn from the study, but I think she left much more than she took, particularly in the form of providing a second set of insights from her observations and discussions with myself and the children. Furthermore, she left behind love which many of the children will never forget.

Gwen Hamlin and Kathy Freidenrich worked hard to turn the dozens of maps (by children and myself) into publishable items at minimal cost. A million stick-on symbols of thanks to both of them! Victoria Hutchinson took on the even more impossible task of turning thousands of pages of my written scrawl into this tidy document.

Cecilia Perez was the final key to my completing this study. Believing in the work, she applied her most impressive and wide-ranging editorial skills and came to know the data and writing as well as I did myself, and so was able to assist me in all aspects of analysis and writing. I often wonder if I would have ever eroded my mountain range of papers down to a readable monadnock without her. Great satisfaction comes from knowing that some of this experience may be valuable in the conduct of her own research on the problems of environmental degradation in the lives of city children, and the development of their environmental values.

Finally, but most importantly, the people of Inavale were extraordinary in their acceptance of me and my investigation as a normal daily part of life in the town. It is a credit to the mothers of the town that they would consider and approve the long-term value of my questioning and observing them and their children over such a long period of time. This was without doubt attributable to the strong support I received from the beginning from the school district superintendant, environmental coordinator and all of the school teachers. I would dearly like to mention them all in person, but in the interests of anonymity for the town as a whole I must satisfy myself with a general thank you for making my two years of research as enjoyable a period as any I can remember in my life.

Should any of the children mentioned here come to read this study for any reason in later life, I am sure they will understand my not mentioning them by name. We have exchanged appreciation for involvement in the study many times in many ways. I can only hope they will excuse the personal "distance" of my account and recognize this was the inevitable result of my training in social science (a social science which has not yet achieved the holistic and humanistic emphasis towards which it must aspire). It surely does not express the hundreds of beautiful hours I spent with them all.

A Guide to Reading this Study

In order to facilitate an understanding of the structure of this study, the chapters have been subsumed under four section headings. For a quick understanding of the nature of the study and its findings, you may read "The Development of the Study" (part I). For a more thorough understanding of the methods used and a more detailed and more qualified reporting of the findings, you should read parts II and III. Part II deals entirely with aggregated data, that is, information which was collected with all of the town's children and then quantitatively analyzed. It is necessarily broken down into four categories of information: spatial activity (chapter IV), place knowledge (chapter V), place values and feelings (chapter VI) and place use (chapter VIII). These chapters serve to provide background data for the more integrated findings of The Family Studies (part III). These family chapters (VIII and IX) report similar data to the previous chapters, but in greater detail and for individual children, thereby enabling integrations of the findings across the previously separated domains of spatial activity, place knowledge, place values and feelings, and place-use; they also include many subjective accounts which further assist in providing a richer, more realistic picture of children's place experience. They lead quite naturally to the summary (chapter X).

In addition to detailed tables of data, the Appendix contains a wide-ranging review of literature on the major areas of child development relevant to children's experience of place. Also, I have attempted to reconstruct my own childhood geography as a source of insights (Appendix F). Hopefully, as you read through this study you will compare my observations with your own childhood experiences of place; this is undoubtedly the most important foundation for an understanding of the subject.

On Renaming the Town and Its People

Although there is no threatening or embarrassing information reported in this study the town, its places and its people, have all been renamed in the interests of guaranteeing that no misunderstandings should arise. The children were renamed using the first names and surnames of famous explorers. Because it proved too difficult to find a sufficient number of female explorers, I had to resort to locating particularly independent female authors, scientists and artists.

Roger Hart
New York

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PART ONE: Development of the Study



PLATE I

"Our greatest period of geographical exploration is that found in each of us - - in our childhood."

CHAPTER I. Introduction

Our greatest period of geographical exploration is that found in each of us--in our childhood (1). All children have an urge to explore the landscape around them, to learn about it, to give order to it, and to invest it with meaning--both shared and private. This much must be stated now as a basic assumption, a belief which served as the prime motivating and guiding force in conceiving, designing, and carrying out the research.

Where do children go when they leave their homes each day, how do they differentiate the environment into places, and how do they feel about these places? To be sure, our ignorance on the environmental behavior of children is in some respects to children's advantage, for adults so often have such limited notions of what is safe and desirable for them that too much knowledge could be prohibitive to children's development! There is a limit however to how much ignorance we can accept from those who have charge over designing, educating, and caring for children, our largest powerless minority. The more urban the setting the greater the "distance" between the children and these persons is likely to be. The role of environmental behavior research is to reduce this "distance" without transgressing the delicate ethical boundary between individual freedom and public control. Any attempts to design successful environments with children should be preceded by an understanding of children's activities in and experience of the physical environment. At the inception of this study, there were to my knowledge no descriptive studies of the behavior of children in relation to the everyday physical environment beyond the simple mapping of play by the design profession. In their description and explanation of behavior, American psychology and sociology have been concerned almost entirely with organismic and social variables. Accordingly, physical places and objects have been considered important to individuals only as "people things"--as carriers of social meaning or of displaced affect. They have proceeded as though each of us moves through a physical vacuum in a world of people and people things; there are no things in themselves. This is a false notion.

My interest in children and their behavior in the physical environment began with research into means of improving the teaching of fundamental geographic concepts in elementary schools (Blaut and Stea, 1971; Hart, 1971). This led to my realization of the necessity for a fuller understanding of child development in the design of teaching approaches and materials. Subsequently, Gary Moore and I explored the existing research and theory on the development of spatial cognition.

1 My fellow geographers remind me of the great explorers of historical time, but I remind them of the total ignorance of the newborn child and the richness of the world that a child contacts in the first decade of experience, and of the power of imagination in childhood, often lost to adults.

(Hart and Moore, 1971). Particular attention was given to the development of children's cognitive representation of the larger environment. In reviewing this literature we realized that although Piaget and others had carried out much research on the development of the child's conception of space, very little was known specifically of children's spatial cognition of the large (geographical) scale environment. We attempted to extend Piaget's work and integrate it with some of the interesting and valuable, but often atheoretical, studies of children's spatial knowledge of and orientation in, the large scale environment. Piaget's research of course had been almost entirely concerned with children's conceptions of the relations of things rather than with their knowledge of the objects themselves. Similarly, our application of his writings led us only into a developmental account of children's knowledge of the spatial structure of environments. We learned nothing of children's knowledge of places. Furthermore, little attention had been given by any other investigators to this or to other dimensions of children's place experience such as their attractions to, or fears of, places (Appendixes A-2 and A-3). Most surprising of all, there was no detailed information on children's use of outdoor places other than playgrounds, except for the aggregate, and rather "distant," observational surveys made for or by planning and housing agencies (Appendix A-4). It was valid for Piaget to explore in many of his experiments the development of children's logical ability to structure spatial relations in the abstract. But such an arbitrary separation of experience is not valid when one is interested in the development of children's knowledge of their everyday surrounding environment with which they have a highly selective engagement. Such knowledge, I anticipated, was related as much to the extent of their access to places and to their place fears and attractions as to the level of their intellectual ability.

For these reasons, I decided to proceed beyond my previous very specific interest in children's cognition of the spatial properties of environments; I wished to explore more fully the development of their place experience. I saw the necessity of considering both their physical and experiential engagement with the landscape from the door of their home to the fringes of their known world. This demanded that I investigate simultaneously their exploration, use, knowledge of, and feelings for places. In short, the major aim of the research was to discover the landscape as it exists for young children.

A subsidiary aim of the investigation was the development of suitable methodologies for the investigation of children's environmental behavior. The eclectic field approach used for this research and a number of the specific methodologies adopted are new or relatively untried. For this reason, it was decided to use a number of techniques for each category of data required. This, it was thought, would not only provide for greater validity of the findings through cross-checking, but also would offer a comparative evaluation of research techniques for future investigations concerning the environmental behavior of children. There is a growing interest, particularly by those concerned with environmental design for children, in methods of ascertaining children's activities in, knowledge of, and feelings for, the physical environment.

In the absence of a single theoretical framework for the study

of a child's environmental behavior, a largely naturalistic and descriptive approach was chosen over experimental procedures. There is a need at this time to ground research, as much as possible, in observations of children in the field rather than in some ill-formed or peripherally relevant theory. I felt that by describing those realms of behavior commonly studied separately (activity, knowledge, and feelings) with the same population of children, insights into the dynamics which run across these realms would quickly ensue. Subsequent research could then utilize the hypotheses so generated.

I needed to observe a small ecological unit--a group of children living in close proximity and sharing a relatively common home space, thereby forming a distinct environmental behavior unit. For this reason, a small, compact, rapidly urbanizing town was chosen. The landscape of this town and its environs as they exist for the young children living in it is the subject of this research. To provide as rich a description as possible, an eclectic field approach was used: ethnographic procedures mixed with observational and experimental techniques. This description uses both aggregate data (all of the town's 86 children, analyzed in terms of age and sex), and integrative data (with individual children in eight families).

The aggregate data of this investigation is reported in four categories: spatial activity, place knowledge, place values and feelings, and place-use. This categorization reflects the very different methods of investigation demanded, and not a belief in the separateness of action and experience, knowledge and feelings. Much of the data are compared by age and by sex in a traditional aggregate manner using these four categories. Less traditional is the preservation of the integrity of the child-environment relation by integrating these categories of data through family studies which consider all of them together for each individual child.

As a child explores, the landscape expands, both in extent and in degree of differentiation. Although many individual places may become invested with social meaning, I believe much of a child's landscape is experienced in a highly personal way. The most fundamental unit of study in describing the environmental behavior of children should therefore be the child and the landscape which exists for him or her: the "phenomenal landscape." To approximate an understanding of this phenomenal landscape of children, I felt it necessary to investigate it developmentally: to reveal the landscape as it evolves through a child's transactions with it. Ideally, this would be done longitudinally with individual children from the time they first explore and make contact with a place-differentiated landscape during the first year of life. This was of course unrealistic for the present program of research. It was possible, however, to adopt a cross-sectional developmental view of the children in the town and, for a year and a half, to observe the individual children of the sub-sample families longitudinally, a part of the research which continues, although through less regular observations.

The research is concerned mainly with the landscape which locally environs a child and the home rather than the total physical world of earth, sun, and sky. Children's knowledge of, and interest in, places beyond the

local landscape were recorded and are reported, but are not the subject of specific procedures. Neither is children's understanding of environmental processes and interdependencies discussed in any detail, for although I could not help but observe children's awareness of how phenomena in the landscape relate to each other temporally as well as spatially, I could only manage to describe the latter in this research. The spontaneous development of children's interest in and understanding of these matters remains a crucial and unexplored field of psychological and geographical enquiry with great relevance for environmental education.

It must be noted that many aspects of the experience of place cannot be discovered by geographical or psychological methods nor in fact by any formal procedure. We must recall it ourselves or rediscover it through empathy with children. In this way we may be able to better understand how particular places are contacted, enter consciousness, and are experienced. This demands that we as investigators discard for a while our reflective abstraction and engage the landscape along with the children. In this way we can approach the description of experience rather than the usual causality-bound accounts of environmental behavior; the problem lies in finding the words



PLATE II

"While I designed my investigation in such a way that it would reveal those places which carry a consensuality of meaning for the town's children, I also made sure that my techniques never excluded those places which carried meaning for a child which had not been communicated with any other person."

CHAPTER II. A Developing Theoretical Perspective

This research did not adopt any single comprehensive theoretical framework at its outset. To conjure one up at the time, either from my own introspection from the casual observation of children, or from the research of others, would have been most unrealistic. To have built a theory of children's place experience, I would have needed to draw upon the numerous theories which had influenced my thinking at that time: cognitive development (e.g., Piaget and Inhelder, 1956; Werner, 1948), social development (Gesell, 1940, 1946), psycho-social development (Erikson, 1963), mother-child attachment (Bowlby, 1969), cognition and action (Lewin, 1938), urban cognition (Lynch, 1960), and social space (Buttimer, 1972) (1). None of these theories provides an adequate framework for this research: to focus in on any one of them and thereby be provided with an instant research approach would have denied the breadth of the study aims. I felt that existing research on children's place experience was at the metaphysical stage of theorizing. There had not been any attempts to investigate the "natural history" of children in their own everyday outdoor environments so it was not surprising that no one had begun to develop a theoretical framework which integrated children's activities with consciousness. The writings of the phenomenologists who recognized the unity of human experience, especially Merleau Ponty, were stimulating support for my beliefs, but I found no clear illumination as to how to proceed empirically beyond the need, already recognized, to engage in personal reflection on my own place experience (See Appendix F).

Therefore, rather than adopting a fully developed theoretical perspective, I chose to proceed with what might be awkwardly termed an eclectic-ecological-field approach. It attempts to describe the environment not only as it is used by a child, but also as it is known and felt, in short, experienced. The unit of study then is a child and her or his "phenomenal landscape." My use of the term "phenomenal landscape" is similar to Koffka's concept of the "behavioral environment" (1965), Von Uexkull's "umwelt" (1957), and Lewin's "life space" (1936). The term differs only in its selective emphasis upon the physical properties of environment--the landscape. It also differs from what geographers commonly recognize as the "perceived environment," a rather static notion of the world as perceptually given. It is worthwhile to dwell on some of the lessons we have learned from "behavioral geography."

"Behavioral geography" has developed very rapidly since the earliest announcements of its genesis (Lowenthal, 1960; Kates and Wohlwill, 1966). Some geographers began to see the need to understand the individual's transactions with the environment, in order to explain many of the patterns and

1 The word experience as used throughout this study, refers not, as some social scientist use it, to refer to the purely affective domains of human behavior, but to the more everyday lay use of the term meaning all dimensions of being in the world--acting, sensing, thinking and feeling.

relationships of people and the land which they had been describing. They looked to psychology for assistance and found one or two persons interested in talking with them about people-environment issues of mutual interest (c.f. Kates and Wohlwill, 1966), but the effort was almost always from the side of geography; it is only in recent years that we have seen true collaboration between geographers and psychologists (Blaut & Stea, 1968; Hart & Moore, 1972; Wapner, Cohen & Kaplan, 1973; Moore & Golledge, 1976). The result then was very often a rather uninformed borrowing of concepts and methods from psychology. It is not surprising that some serious misconceptions were made by geographers regarding the individual's experience of the environment. The most serious in my mind is the static notion of consciousness implicit in much of behavioral geography (the same is true of much of the similar work by the environmental design and planning professions). Geographers became extremely pleased with themselves for breaking the dualistic conception of "man and (objective) environment," but they replaced it by a new dualistic conception: "man and environment as perceived." The task of behavioral geography has been seen by some as a need to zip through all areas of geography and re-map the world using this new discovery. All one needs to do is find out how the environment is "seen" by people and replace objective reality with these various "perceived" realities. The map has been our most trusty servant, and so the new tool became the "mental map." With amazing naiveté (for a bit of old-fashioned introspection would have quickly shown these investigators their mistake) geographers proceeded as though people had "maps" in their heads of different places which remained constant over time and for different purposes. Had they simply reflected on their own experiences for a while, they would have recognized the naiveté of this notion but unfortunately, introspection had long been banished as something totally unacceptable to any behavioral "science." At least some of these new behavioral geographers explained that these were not necessarily "maps" for we know nothing about the inside of that "black box" called the brain (eg., Blaut & Stea, 1969; Downs & Stea, 1973), but still there was the clearly implicit belief in a fixed view of the physical environment which geographers could discover by simply using the methods of psychology--the new objective study of "perceived reality." No recognition was made by geographers of the variability of our experience of the world with different situations or moods. Had they dared to reflect they would have quickly realized, as did James in the early days of psychology, that "each world whilst it is attended to is real after its own fashion, only the reality lapses with the attention" (James, 1890, p. 293).

The most obvious reflections of this great misconception were the host of mental mapping studies which followed the publication of Lynch's Image of the City (1960). Study after study described people's images of dozens of cities, without asking if these images might change as any person engages with these cities for different purposes. Dennis Wood broke the monotony by producing a study which looked at dimensions of city experience other than the visual (Wood, 1971), but he failed to build into this, or into his excellent later study, a recognition of the multiple nature of our experiences of place (Wood, 1973). Unlike previous conceptualizations of man-environment by geographers, this study recognizes the simple notion that consciousness is not static.

As a geographer, discovering cognitive developmental theory was exciting (Hart & Moore, 1971 and Appendix A-3). Having realized the need to go

beyond children's cognition in order to construct a more complete account of the development of children's experience of the environment, I looked forward to an equally well developed understanding of other domains of children's environmental behavior. I was largely disappointed, as Appendix Nos. A-1, A-2 and A-4 reveal. I found that there were different sub-domains of psychology with very little communication between them. It is for this reason that the studies of children's spatial behavior (Appendix A-1), place knowledge (A-2), place feelings (A-3) and place-use (A-4) are each reported separately in Appendix A.

For a child, of course, these various aspects of place experience are not separate, but because of the total emphasis upon objective analytic research, there were no integrated, holistic accounts of children's place experience. Instead, the research was broken down into some interesting dualisms. The mind-body dualism had led to the study of children's mental engagement with the world separate from questions of their actions in the world. This dualism is further compounded by the sub-dualism of the complete separation of research on knowing (or cognition) from any research on children's feelings for the environment. This fourfold breakdown of the area is recognized not only in the Appendix, but also in the collection of the aggregate data for this study. I, like almost all other persons in our society, find it difficult to proceed systematically without these divisions which have become so much a part of our thinking. But there is some rationale for these methodological divisions. Children's activities are amenable to observation; their thoughts and feelings are not. Children's thoughts and feelings themselves call for different procedures. While there are various, much-utilized methods for studying children's thinking- methods in which psychologists have developed considerable confidence- the investigation of children's feelings has remained more problematic. It is easier to re-think a thought, it seems, than to re-feel a feeling. For these methodological reasons, I found it necessary to maintain the major categories in describing the research design.

While many social and behavioral scientists now argue that knowledge, feelings, and actions must all be studied in an integrated manner, how these should be put together remains the subject of extensive debate. One popular position is that the sole purpose of knowledge is to serve as a guide for action:

"Knowledge, action, and evaluation are essentially connected. The primary and pervasive significance of knowledge lies in its guidance of action: knowing is for the sake of doing. And action is obviously rooted in evaluation." (Miller, Galanter and Pribram, 1960).

Reflection upon my childhood tells me this statement does not offer the whole story. I explored environments, as I am convinced all children did before me, simply to satisfy my curiosity for places around me; knowledge for its own sake. Furthermore, not all action is "rooted in evaluation"; a child exploring the environment may be doing just that--exploring places which, initially at least, have not been differentiated and evaluated. Certainly, knowledge and action are inextricably linked; as well demonstrated by Piaget's work. But Piaget offers no suitably comprehensive theoretical perspective either, for he found it necessary in his program of research to ignore chil-

dren's interests in, or feelings for things, in order to study the structure of their knowledge. The position taken in this research is that place knowledge undoubtedly plays a part in the guidance of action. However, this knowledge must not be thought of as ever-conscious images of the world to which a person refers when making spatial decisions, as though the brain contains a map. It recognized for example that a large proportion of our everyday movements arise out of habit and the directedness of the body (Seamon, 1977). However, my own experience tells me that our directly experienced environment, together with much indirect information of distant places, is mentally represented by us in a spatial manner. I suspect that this knowledge is extremely important in our mental organization of information as well as in the guidance of our movements through less well known areas and into new ones. In summary, while I held a theoretical conviction that knowledge and action were integrally related, the values of place knowledge to an individual was left open to question.

Another popular conception among social and behavioral scientists concerning an individual's relationship with the environment is that the meanings of things in the environment arise out of social interaction with other persons. People's actions toward these things are then based upon social definition. While I accepted the fundamental necessity of a social context for the development of mind, I could not accept the extreme position of those who claim that the meanings of all objects arise out of social interaction. Even the simplest of observations of children told me before my research formally began that many places have meanings known only to one child. A mud puddle, for example, may take on meaning for a child as a place to jump in and such a determination of meaning may set the manner of that child's future use of mud puddles, even though all social interaction with others strongly indicate that puddles carry an entirely different meaning to adults. In summary, I anticipated that many places in any child's "phenomenal landscape" would carry a personally as well as a socially determined meaning for that child. Consequently, while I designed my investigation in such a way that it would reveal those places which carry a consensuality of meaning for the town's children, I also made sure that my techniques never excluded those places which carried meaning for a child which had not been communicated with any other person.

Lewin believed he could discover the properties of the psychological environment by simply observing what an individual does in any particular situation. He considered it unnecessary to ask an individual questions about his or her private experience and consciousness for he believed that explanation lies in the dynamics of the immediate situation. I felt that to describe all of the properties of the local landscape of a child entirely on the basis of observation would demand an unacceptable amount of inference. Ecological psychologists have been attempting to do this for many years with the claim of making no inferences while recording the total context of behavior, but they did not even recognize until recently that the physical environment itself is an important part of the ecology of a child (Barker and Wright, 1951, 1955 and Barker, 1968). I have chosen to supplement observations of children's spatial behavior and place-use with techniques designed to elicit their knowledge of, and their feelings for, places. The purpose of this is not simply to find shortcuts around the long and arduous direct observation of child-environment interactions. I believe that by considering a child's as well as

the observer's perspective I am able to better approximate in my description the richness of a child's phenomenal landscape.

However, the approach adopted for this investigation remained similar to Lewin's ecological approach. My purpose was to describe children's active engagement with the environment (their spatial behavior and land-use), while at the same time discovering their knowledge of, and feelings for, places in their environment. I believed that by collecting data in each of these categories concomitantly I would achieve a broad description of the children's phenomenal landscapes (both individual and consensual). I also believed that patterns of relationships would emerge between those realms of behavior normally studied discreetly: activity, knowledge, and feelings. Lewin, quite rightly, believed that one had to observe behavior in situ and to describe behavior for one individual at one moment in time in order to be able to identify the complex set of forces influencing the behavior at that time. My research could not solely do this of course because its purposes were broad. Wishing to understand development over a wide range of ages and with both sexes, it was necessary to work with a large number of children which in turn demanded some quantification of data in order to achieve generalizations for comparison. Also, whereas Lewin's experimental studies involved one or two elements, the present investigation was concerned with children's total outdoor physical environment and their spatial behavior and place-use over extended periods of time. Nevertheless, Lewin's belief that there are enduring forces between child and environment in the form of attractions, repulsions, routes, barriers and restrictions which could not be identified, was central to the design of this investigation. It was on the basis of this that I anticipated any theoretical insights of this study would be revealed through my detailed study of individual children. An aggregate comparative analysis could only provide me with useful contextual information for those focussed case studies.

This ecological approach satisfied me as being suitably rich and dynamic for delineating the major forces influencing children's environmental behavior, but fell short of approaching place "experience," the title of this investigation. As previously explained, I understand place experience to mean action in, knowledge of, and feelings toward place. These are experienced together by the individual. Unfortunately, as soon as one asks a child to reflect upon their environment, thought breaks down the unity of experience. It also objectifies the environment; separating a child from his or her world. Clearly the eclectic-ecological-field approach described above for all its breadth would not offer a valid holistic picture of experience; it relies upon analytic categories which destroy the integrity of experience and completely denies those aspects of experience which are not available to objective analysis. I turned to the phenomenologists for clues as to how to proceed, most notably to Merleau Ponty (1962, 1964), for I understood that their interest was in the direct experience of everyday events. I learned that it is necessary to look to one's own experiences and learn to describe them clearly and simply. But my interest was in children's experiences of place and so the method was not available to me; there is it seems no genetic perspective in phenomenology. I chose to adopt two approaches which I felt would come closer to approximating a description of children's place experience than those techniques handed to me by psychology: first, I would reflect on my own childhood experiences of places, and secondly, I decided to share as fully as possible

with my sub-sample of children, in their direct experiences of places. Through close participation in the environmental activities of individual children, I hoped that empathy might bring me closer to children's experience of place; to their phenomenal landscape as it expands and contracts, attracts and repels. As "science," this is of course frowned upon, but all other approaches destroy the integrity of the child-landscape transaction. Without this approach I anticipated that there would be little hope that I would gain insights into how the various aggregate analytic data (spatial activity, place use, place knowledge, and place feelings) interrelate to form the whole which is place experience. In this way I hoped to reveal something of a child as a person rather than completely limit myself to a fragmented objective account of the child.

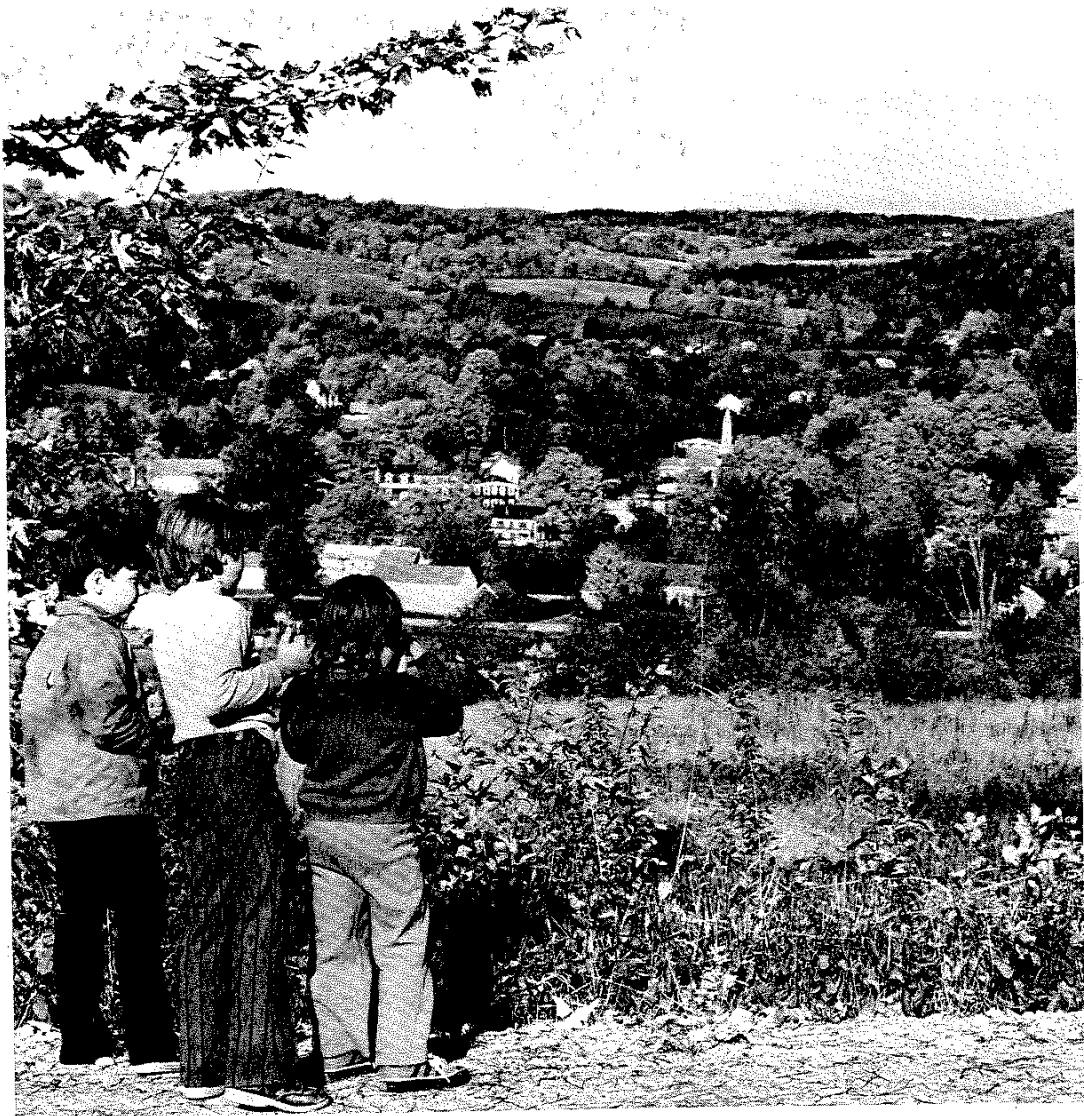


PLATE III

"Inavale is a fairly typical New England town. White wooden houses neatly line the streets . . . the landscape of this town and its environs as they exist for the young children living in it, is the subject of this research."

CHAPTER III. Research Design

The last two chapters outlined how little the proposed research area had been investigated previously and demonstrated that sub-issues could not be isolated for study. For these reasons, it was necessary to design research which would be both descriptive and holistic. The research approach adopted was therefore, in large part naturalistic, and the essential unit of study became individual children and the landscape which exists for them. Before presenting the details of the adopted research approach, I offer a brief description of the evolution of the research design. Through a history of compromises, I only narrowly avoided adopting a research design which would have been extremely restrictive for the problem at hand.

The Evolution of the Research Design

The evolution of a research design did not follow automatically from the identification of the research aims. At first sight the investigation of spatial activity and place use might seem to call for the field methods common to social geography, whereas place knowledge and place feelings suggest the experimental procedures of psychology. But I concluded that if I was to be able to directly relate the data on spatial activity and place use with that of knowledge and feelings, it would be unrealistic to work partly with children in the field and partly in a simulated or laboratory environment. Instead, a research design evolved which combined the two approaches; it would have been a truly geographical-scale experiment.

I planned to use a model (i.e., reconstructed) colonial village as a geographical-scale "laboratory." This would have enabled me to investigate, in an experimentally controlled manner, children's exploration of a landscape. Fortunately, I realized in time that I had fallen for the attraction of the experimental approach and in so doing had lost sight of the original breadth of the subject. Before experimentation can honestly proceed, a subject area must be explored and differentiated. This is best done empirically, from observations of behavior in situ rather than in a totally intuitive or metaphysical manner. The way a child gradually explores, comes to know, and experiences a strange landscape cannot be compared with a child's relation to the home landscape, without knowing anything about that home situation. This belief was for some time buried by my desire to please those who would call for rigor before realism, reliability before validity. My conviction that to proceed in such a manner would be dishonest developed as I reflected on my own childhood and talked with friends about their childhood place exploration and experience.

The original experiment would have excluded the child's own home, which we may anticipate to be the center of exploration for all children.

The home is the physical starting point and as an extension of parental security it is probably the emotional pole; the secure home base, from which a child explores. It demands a great assumptive leap then to believe that the development of children's patterns of exploration and experience of places in the "laboratory" setting would be similar to that in their home area. Thus, while the geographical-scale laboratory may seem to have offered greater comparability between subjects by holding the physical environment constant, I would have fallen into the trap of experimentation: reliability before validity. By choosing to work in a natural setting I accepted the seemingly difficult situation of studying children's exploration of the landscape from places unique to each one of them--their home. But in fact, the home is probably more experientially similar for each child than some arbitrary locus of a laboratory environment would have been. I was willing to assume this much about a child's phenomenal landscape at the outset of the research. From this sequence of development, I concluded that "integrity" should be added to the vocabulary of research design. Recognizing the integrity of the everyday setting is essential to an ecological perspective on people-environment research. In addition, I felt a sense of personal integrity with my work after adopting a research design which did not jump the broad questions but began by looking closely at the complexity of children's everyday interactions with an expanding landscape. In this way I learned that feeling good about one's work is essential if one plans to give it more than the obligatory academic attention.

As I progressed with the research and as various hypotheses began to arise, the temptation grew to pursue these hypotheses in detail. I seriously entertained the possibility of using, for instance, the various standardized measures of personality and cognitive style, such as the indices of "social maturity," and "field dependence/independence." I resisted these temptations for a variety of reasons. The primary one was my fear of losing hold of the descriptive, holistic purpose of the study as I lost time in these interesting but somewhat premature avenues.

Location of the Study and the Population

The naturalistic approach adopted for this research required an identifiable "environmental behavior unit." This required the social qualities which make up the essential unit of ethnographic research: the Primary Social Unit. As defined by Whiting, Child, and Lambert (1961, pp. 147-156), a Primary Social Unit must:

1. Conceive of itself as some sort of unit.
2. Have frequent interaction.
3. Possess temporal and/or spatial stability.

In addition, I required a spatially compact unit so that the children would reside close together, thereby maximizing those places used in common. I had hoped to work with an urban population for this was where the greatest problems seemed to lie in the quality of children's environments. From previous work with children in Worcester, Massachusetts,

however, I realized that it would be very difficult to find a suitable environmental behavior unit with less than 100 children in a city. I chose to look for a small and compact town with a relatively stable population, yet exhibiting as many urban traits as possible. Such requirements would seem to contradict each other, but Inavale was ideal. Though small in population (approximately 800), the town is rapidly expanding through tourism and has a busy commercial center (1). Compact in form, it includes two major state highways. Fifty percent of the population consists of relatively stable local families of modest income; the remainder are out-of-state middle and upper income families.

Inavale is a fairly typical New England town. White wooden houses neatly line the streets. Trout River and its tributary, the West River, effectively divide the town in three hills (Map, Figure 3-1). Parallel to these rivers are two main highways (Main Street and Snowdon Road) which form a "T" junction in the center of town (Map, Figure 3-2). The main axis runs from East to West. In the center of town is the expected dense group of stores, three churches and the town hall, but extending easterly along the main axis in the form of gift shops, gas stations and eating places is the new commercial strip; together the two areas are known as "Downstreet." Residentially, the town consists of strip housing along the two main axes, medium density housing on the three hills and two compact blocks of houses on the land adjacent to the crossroads forming a distinctive residential cluster in the center of the town.

Socio-economically, the town describes itself as consisting of three zones. Along Main Street to the East and West of the commercial district, and in the two compact blocks in the center of town (School Lane and Field Lane), the population is predominantly "local"--people who have resided in the town for at least a decade. The houses are old and close together. The Greenlawns Hill population is from out of town, and with one exception, from out of state. They live in houses built within the past five years, and may be described as middle-income families. The vegetation map (Figure 3-3) shows the distinctive landscape of this tract: generously spaced housing separated by large unfenced lawns. Plum Hill and North Hill are mixed in population: both old houses with "local" residents and houses built largely in the past ten years with new residents. The town's land-use is mapped in Figure 3-5.

Only those children who had resided within the town for at least

1 "Town" is used here and throughout the volume to refer to the central settlement only (Map, Figure 3-2), as distinct from the larger "township" of Inavale (Map, Figure 3-4). The remainder of the township is made up of single family, dispersed housing and some "developments" where single family homes lie relatively proximate to one another, each house set on a one- or two-acre lot. The total "permanent" population of the township of Inavale is commonly more than doubled on weekends and holidays by a temporary population living in vacation homes and cabins.

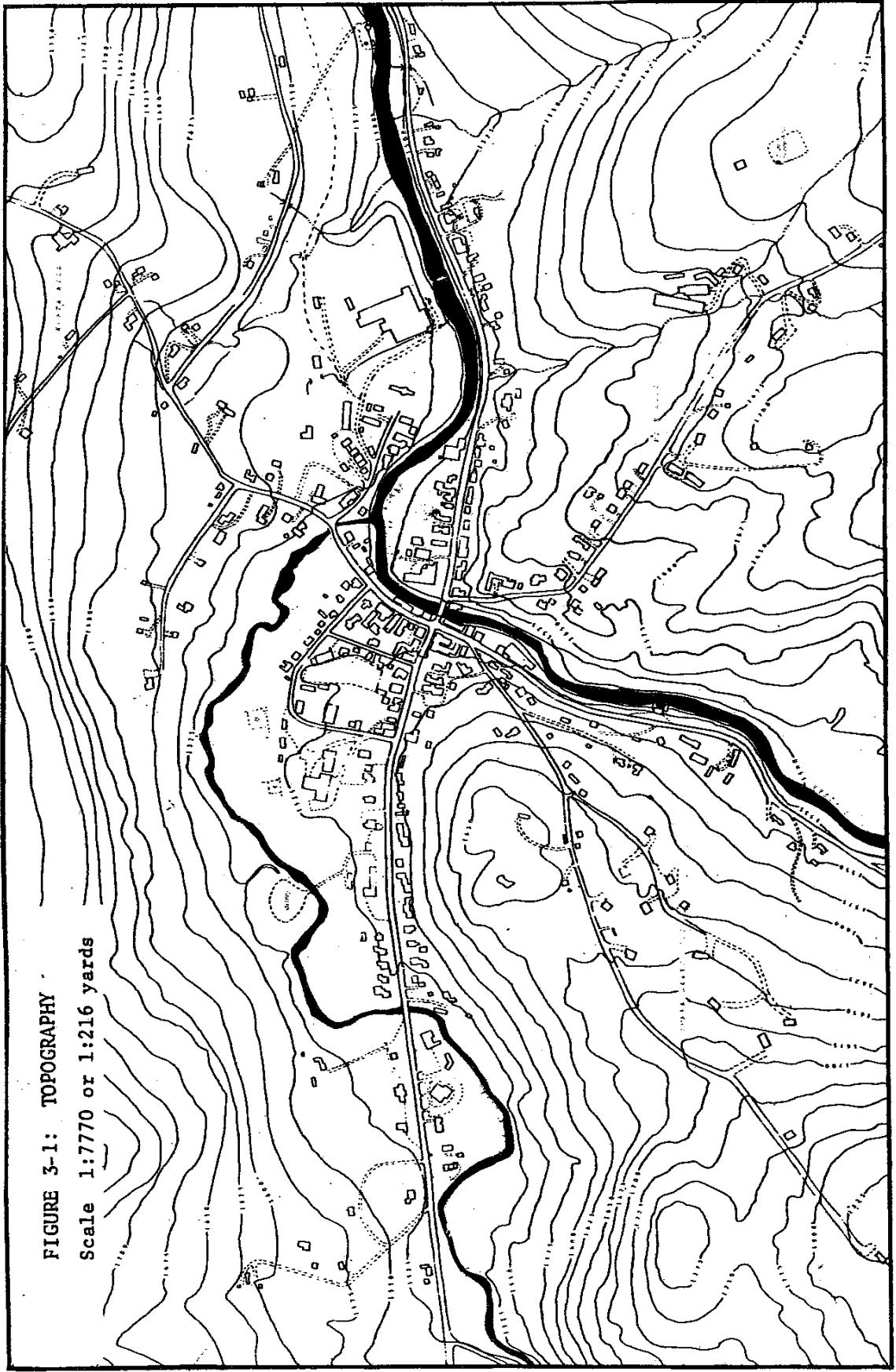
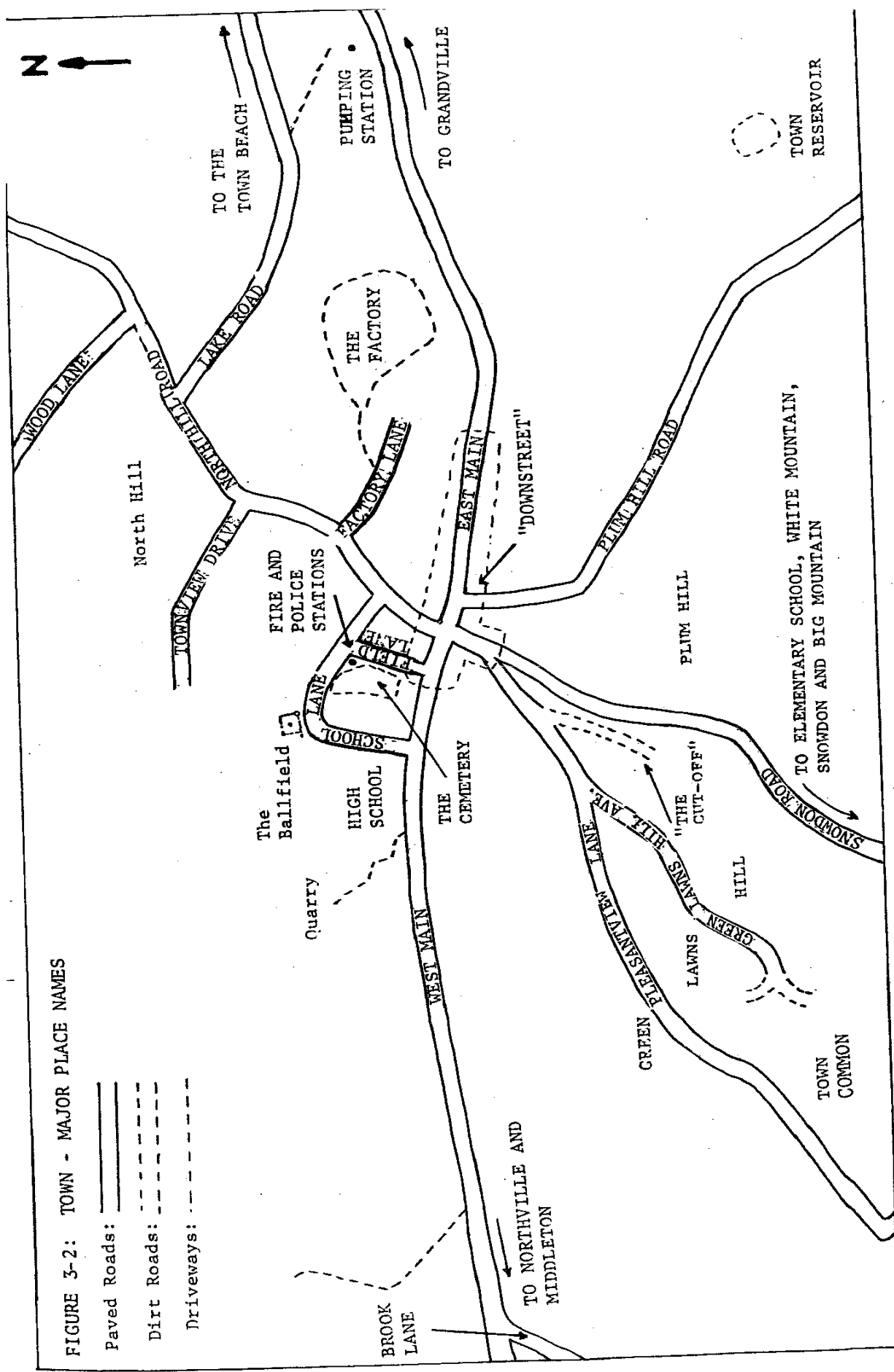
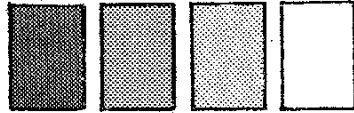


FIGURE 3-1: TOPOGRAPHY
Scale 1:770 or 1:216 yards



KEY TO FIGURE 3-3



Mature Trees and Woods.

Secondary Growth (Trees younger than ten years).

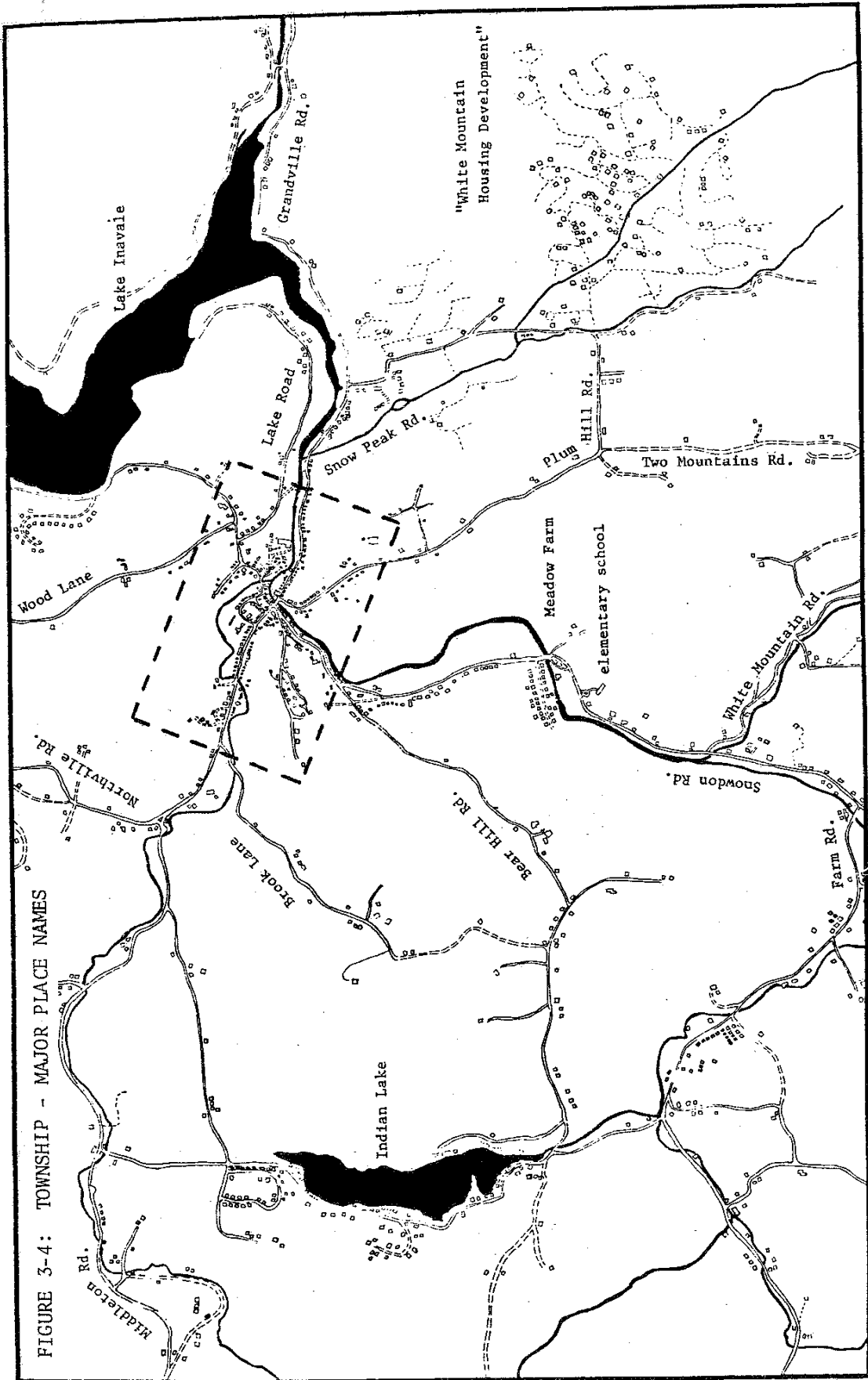
Mown Pasturelands and Lawns.

Bare Dirt or Black Top.



FIGURE 3-3: VEGETATION

FIGURE 3-4: TOWNSHIP - MAJOR PLACE NAMES



a full year were formally included in the research methods for purposes of comparative analysis. However, each research procedure was used with all children to avoid shunning any of them. With 86 children aged between four and 11 years enrolled in the school year of 1972, there were at least eight town children in each grade level, enabling some comparisons of data by grade groupings. Because only three children were in an inappropriate grade for their age, the grade levels may be taken as representative of age levels (Table 3-1).

TABLE 3-1

DISTRIBUTION OF SCHOOL CHILDREN BY GRADE AND SEX*

	P/K**	K/1	1/2	2/3	3/4	4/5	5/6
BOYS	3	5	4	14	2	9	9
GIRLS	1	5	5	7	6	7	9

* Half of the data was collected while children were in one grade level and half while they were in the next older grade level. In all subsequent tables, an asterisk is placed above the letter or number corresponding to the correct grade at the time the data were collected. For example K*/1, represents data collected in kindergarten, while K/1* represents data collected when the children were in first grade.

** Throughout this work, P is used to refer to pre-school and K is used to refer to kindergarten.

It became most evident by the Spring of 1972 that I would not be able to work with all of the children on each of my planned methodologies. For this reason I decided with great reluctance at the time, to choose a sub-sample of 20 children that I could spend more time with. Random sampling procedures would not have been suitable for selecting this sub-sample of children, for I wished to:

1. Choose children from all parts of the town in order to maintain some contact with all children, the original holistic approach of the research.
2. Include one child of each age and sex in order to maintain some balance in the demographic characteristics of the sample population.
3. Recognize the effects of different family size by including small and large families.

Following these three criteria, I chose eight families, totalling 20 children. I soon discovered, however, that two of the families of children lay within clusters of other children's homes that formed distinctive and relatively closed sub-systems (i.e., high levels of social interaction within them, and very few contacts with children outside of them). I began to notice some marked differences of environmental behavior both between these two clusters and in comparison to the relatively isolated single families of children. I therefore chose to include all of the children of these clusters in the majority of my sub-sample procedures. I already knew that these children played together so much that it would have been difficult to work with just one family to the exclusion of the remainder (see Map, Figure 3-6). Only one of the family clusters and one of the isolated families are described in this report (Chapters VIII and IX).

The Basic Methodologies
























Environmental behavior research is new and few of the methods adopted for this study had been previously employed. It was necessary therefore, to use a variety of different methods, some more distant or objective but offering reliability, others closer to the child or more subjective but carrying greater validity. Together, these provide a closer approximation and a richer account of the landscape as it exists for the children of Inavale than could have been provided by using just one method for each aspect of the research. In some cases, methods considered less valid than others were applied to the total population in order to acquire aggregate data, but such expedience was balanced by using more trustworthy methods with the sub-sample of children. Because of my desire for cross-checks of reliability and validity, whenever doubts arose as to the suitability of a research procedure, new techniques were devised. The genesis of such new techniques are described along with the detailed description of all procedures at the beginning of each of the four following chapters of aggregate data. First, a general description of the basic categories of methods is offered to highlight their relative strengths and weaknesses.

The overall approach adopted is most closely described in the language of social science as ethnographic. Four categories of techniques were utilized: direct observation, structured interviews, tests, and ethnographic interviews. "Ethnographic" describes the nature of my relationship with the children. Because each of the other methodologies are dependent upon this ethnographic relationship, more attention is given to it in the following discussion.

The Ethnographic Approach

The Nature of the Relationship

The most important distinction between the ethnographic approach and other types of interviewing is the relationship between the interviewer and the interviewee. The ethnographer is not seen as an expert on the subject under study, as is usual in other social sciences. Instead,

	Elementary School child's home		Bank
	Other houses		Office
	Garage		Post Office
	Church		Library
	Church school		Vacant building
	Gas station		The Town Garage
	Store		School bus garage
	Police station		Elementary School
	Firehouse		High School
	Supermarket		Manufacturing
	Restaurant		Barn, shed, sugarhouse
	Inn, lodge, motel		

KEY TO FIGURE 3-5: LAND-USE

FIGURE 3-5: LAND USE

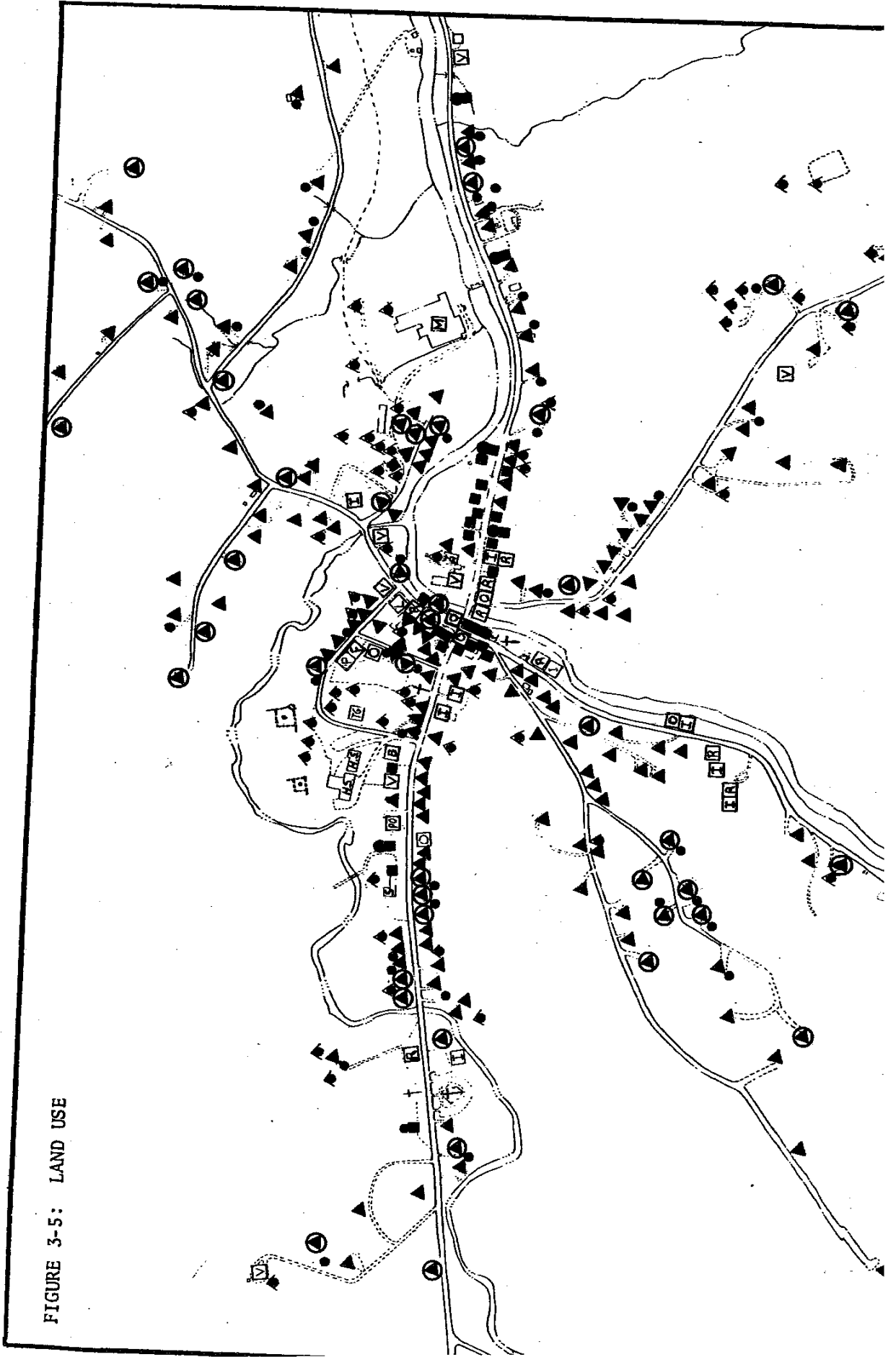
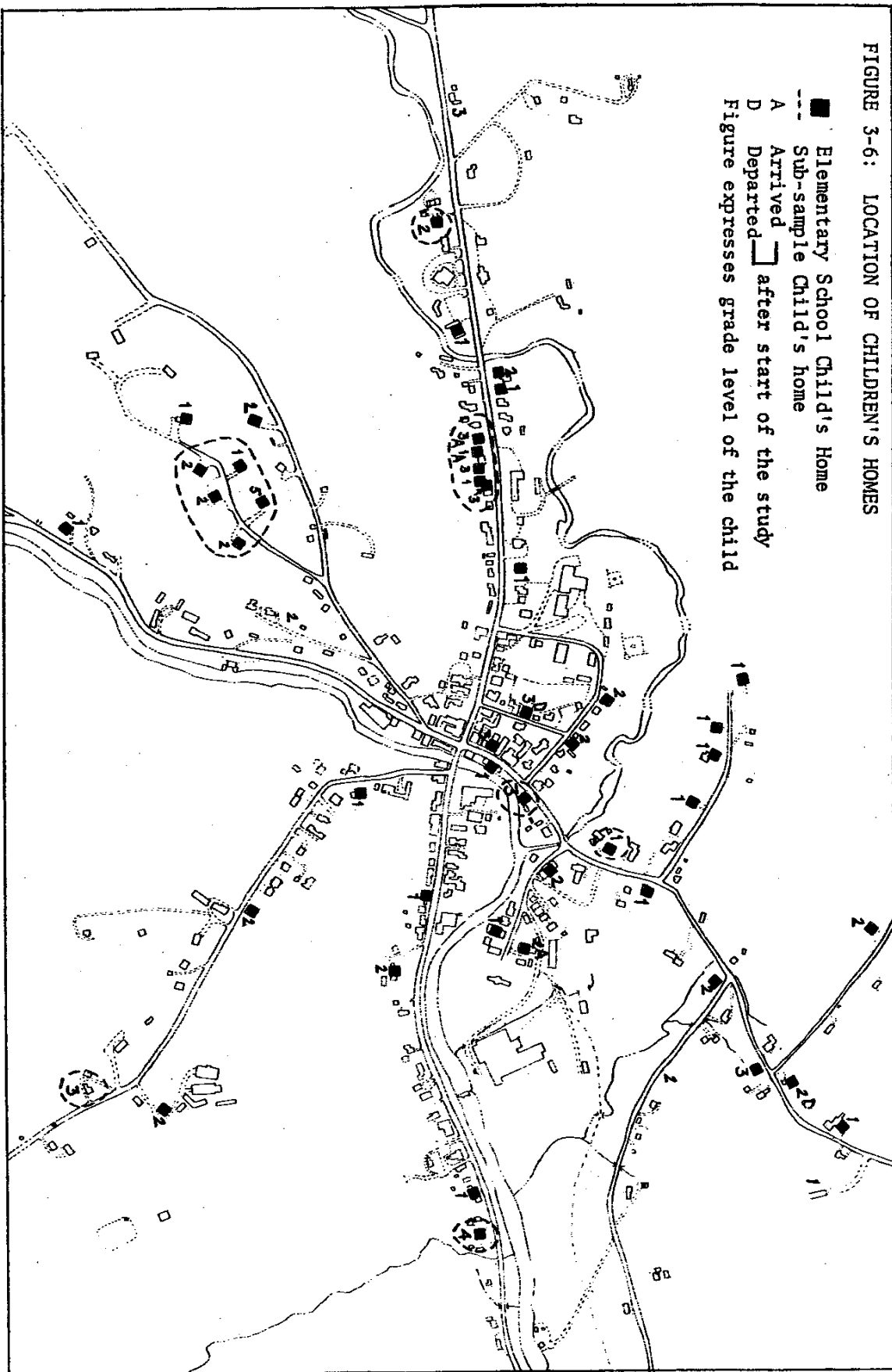


FIGURE 3-6: LOCATION OF CHILDREN'S HOMES

- Elementary School Child's Home
 - Sub-sample Child's home
 - A Arrived after start of the study
 - D Departed after start of the study
- Figure expresses grade level of the child



the interviewee's expert knowledge of his or her own culture is stressed, while the interviewer claims only a knowledge of other cultures. The status relationship is therefore more nearly equal. Such a relationship requires that the interviewer be from a different culture from that of the interviewees. Fischer and Fischer(1961), in their ethnographic study of child-rearing in a New England town, complained that "unlike field workers in many foreign cultures, we had little entertainment value for members of the town." They found it very difficult to get people to make generalizations about the town because they were studying their own culture.

I found no similar problems with the adults or the children of this study. I was of a different culture but not only by virtue of my British nationality, but the parents, informed by very real day-to-day concerns of their children's problems, saw me as an academic trying to inform myself of these matters with the goal of improving the design of environments for children. They easily accepted my role as inquirer and were most able and willing to generalize on their role in influencing their children's environmental behavior. An even greater cultural distinction was made by the children. I was an adult; a member of a truly different culture. Furthermore, they came to realize that I was deeply interested in their environment. This provided an extremely good working relationship with the children. Surprisingly, such an ethnographic approach has been ignored in past research with children; there has been an almost total reliance on observation and the accounts of parents.

I had planned to live within the town, thereby benefiting from continued observation of the children and from increased interaction with them. There were, however, advantages to living a little way beyond the town limits. I anticipated that my life-style would be different and that this might lead some parents to distance themselves from me. The discovery of very economical housing outside of the town added a practical dimension to this idea. But the most important consideration of all, concerned the delicate balance in the triangular relationship between parent, child and myself. By living outside of the town I contacted the parents much less than I did their children, with whom I worked in the streets, yards, fields and at school. I was thus able to establish relationships with the parents sufficient for them to trust me for long periods of time with their children, but not so much as to pose a threat to the children who had to feel free to tell me secrets about their spatial behavior without fear of recrimination from myself or from their parents.

This fine working relationship did not of course develop at once. It began with my work with the children in the school. (An earlier census with the parents had developed no important relationship at all.) By working closely on model-building with each child in the town, for an average of three hours per child, I was able to develop very quickly a good relationship with them. The children enjoyed the model-building so much that favorable reports went home to the parents. With the coming of spring, I began spending time with the children in the town, playing and talking within sight of the parents, and occasionally discussing with them the purpose of my research. An adult who spends so much time with their children cannot help but become accepted by the parents. And so the bond grew.

By the beginning of the summer my relationship with the sub-sample of families was well established. When I entered a home there was never a doubt whose guest I was: I was the children's. Awkward situations, such as the children dashing out to a swing and leaving me alone with the parent, would occur only with new families or, occasionally, when I had offended children by spending more than a few days out of town. In fact, because of the nature of the relationship I developed with the families, parents often offered me the same casualness of interaction and the same freedom to enter kitchens for refreshment as they offered to their children's friends. The only occasional difficulty for the parents was explaining to adult outsiders who this strange elongated member of the "gang" was.

However, I sensed that a few parents were unsure about me and the purpose of the large amount of time I spent with their children. Occasionally this would lead me to retreat from contact with the parents rather than to reach out and discuss any doubts they may have had. The children themselves usually did not allow this type of a barrier to develop between their parents and a growing friendship. One humorous example occurred one evening in early July after interviewing the sub-sample of children all day about their spatial range. I was tired and hungry, and as I completed my discussion with the final child of the day, I noticed her father watching us, straight-facedly, from the front-door stoop. As I turned my car around in the driveway and prepared to leave, the eight-year-old asked me, "Don't you want to meet my father?" I explained that I was tired, but she knew better and proceeded to shout at the top of her voice, "Come on, he won't bite you!" I went. On this occasion, and on many others before and after, I was amazed by the cordiality extended to me by the parents through their children's mediation. This particular father and I talked for two hours over a wealth of issues and continued to do so throughout the study. And so, by the middle of July when I needed to work closely and regularly with the sub-sample of children, I had become a friend to them and was accepted by their parents. The final working relationship with the parents continued throughout the research, only occasionally disturbed by my returning home late for meals with a child!

The children were not always interested in talking to me as I travelled around the town pursuing some particular question, but would prefer to show me or share with me some activity--fishing, sliding or some organized game. Such activities were often unrelated to the question I had in mind for the moment or even more generally for the research. On these occasions, I had to draw upon considerable reserves of patience. After a time, however, I realized that this play was not only a necessary part of a friendly relationship with the children, but it often revealed to me aspects of their play which would not have been discovered through interviewing. Moreover, it was fun!

Problems Along the Way

It was necessary to work more closely with the children of the sub-sample than with others, yet still maintain contact with all of the

children. At times this proved to be a difficult task since the unequal amount of time I spent with different children could easily precipitate feelings of jealousy. One day, after a child's birthday party, I drove one of the boys from Greenlawns Hill to his house on Main Street. Stories were quickly recounted among other children of what an excellent baseball game we had upon our arrival there, and for a day after, their jealousy prevented my talking with them. Fortunately, most of the children understood the impossibility of my working equally closely with all of them.

From the beginning of the investigation I anticipated problems in balancing the degree of my contact with all of the children. By making occasional summations of the entries made in my logs I was able to assess any biases toward certain age groups, towards one sex over another, or toward certain families. I soon realized that I was not meeting readily children below the third-grade level. Naturally they were not "around town" as much and when I did see them, they did not come forward to talk to me as quickly as older children, being absorbed in their own play. In order to interact with them as much as the older children, I needed to search them out more. (This is one of the major reasons for deciding to work with a girl and a boy from each age group.) This problem is similar to one in ethological observation: the tendency to over-observe the behavior of the more active organisms in any population. Fortunately, since young children have relatively little time to talk or play with their fathers or other male adults, especially during the week, the fact that I am male was probably an advantage in my getting to know them. Also, children in the younger elementary grades typically had no male teachers. My time with me was therefore probably valued more than it would have been if I been female. In this way I managed to redress the age bias, but I later noticed that I was learning more about boys than I was about girls. Boys would far more readily bring me into their play or conversation than would girls. When I made the request, however, I felt the girls were every bit as willing to talk with me and show me places. As with the age-related differences in the amount of contact I had with children, I had to keep this problem in mind and attempt to balance out the time I spent with boys and girls by searching out girls a little more and leading them into conversation. Ideally, this kind of research should be carried out jointly by a man and woman.

In the middle of the first summer, I seriously risked the excellent working relationship I had developed with the children. I had to ask the children to keep diary records, with my help, of their place-related activities for an entire week. Because the children would have to do a considerable amount of work for me, I decided to employ them. As a result, after working for four days on the diaries, I offered the six children who pre-tested them a small amount of money for the task. I felt that by explaining that I had just received some money to help with the study and because they were doing work for me, they should share some of this money. I thought this might both help the children realize the importance of the work and recognize my appreciation of their assistance. The plan backfired and I was embarrassed by my failure to recognize the spirit of my relationship with the children. Two of them solidly refused the money, explaining that they were my friends, that they were helping me and that it wouldn't be right to take money. The others became so concerned about

the money that they began to relate to me very differently. I quickly became an estranged employer. They seemed less interested in working on the diaries than arguing about and spending the money. I retreated from this plan immediately and decided to limit my treats to occasional visits to the ice-cream stand. I learned that "working with" and "working for" are not subtle differences in participatory research.

On the Sensitive Pursuit of Questions

I had planned in the evenings to analyze my data as it was collected in order to monitor the success of the methods. This proved impossible. I had to work continually with the children every day in order to obtain data that would not be so dispersed in time as to be made incomparable. This meant that by the time the children were ready for bed each night, so was I. All that I could manage each evening was to keep on top of the detailed maintenance of my log and to identify any questions that may have arisen during the day. So numerous were these questions that I had to design a well-organized system for pursuing them. I carried with me at all times 3" x 5" index cards. Each question of the day would be written up on one of these cards. Also written on this card would be the names of persons or places I must visit in order to answer the question. By referring to the cards throughout the day, I could remind myself to keep an eye open for some particular person and to informally direct the conversation toward some resolution of my question. In this way my questions were experienced as just part of my informal chats with children or their parents, rather than the persistent prodding and probing which would have gradually led me into an alienated relationship with the community.

Direct Observations

The most well-tried methodology in the study of children's relationship to the landscape is direct observation and recording of their activities. Direct observation was used very little as a standardized technique in this research because of the scale of the environment under study. For the entire year and a half of the study, however, it provided the ultimate check on questions arising out of other procedures.

In addition to the one formal method of direct observation (to be described in Chapter IV, "Spatial Activity"), observations were made throughout the year by making drive-around tours of the entire town on all days when outdoor activity by the children was possible, and when I was free from other school activities. Whenever a specific question needed to be pursued, however, the standard drive-around survey was modified. Often the whole after-school period from 2:30 to 6:30 p.m. was spent with one family. This was the case, particularly after the Spring of 1972 when I began to work more closely with the sub-sample of children. Observations from these surveys were recorded in a log and were frequently supplemented with photographs. Photography proved to be a particularly useful tool in this regard for it provided a cross-check for the log, and a means of identifying location, activities, and materials used during play. The log and the photographs were frequently re-read for they contained

within them the germs of developing hypotheses, of questions to be pursued, and of observations and comments to be checked.

The Structured Interview

For a variety of reasons, I could not rely upon the traditional structured methods of data collection employed by some geographers in their study of spatial behavior. Objections to traditional questionnaire approaches with children are numerous: children's limited common vocabulary, lack of interest, and "short attention span" for this type of procedure. Another weakness of such highly structured approaches is that they demand that the interviewer know in advance the specific question he or she has in mind. With an exploratory study such as this, there are as many questions to be formulated as there are questions to be answered. It is important to remember that most of the knowledge lies with the interviewees not with the interviewer. This belief led to a greater reliance upon the ethnographic type interview. It was necessary to design structured interviews on some aspects of the research in order to obtain data which could be aggregated and then compared by age and by sex. However, because of the problems of using these, especially with children, I consider them less valid than any of the other three categories of method employed.

Testing

A number of standardized types of exercises were used with the children, but only one of them resembles what is commonly described as a test. These methods were required for those parts of the research which could not be investigated through the use of interviews or observations. Place knowledge falls solidly under this category and, in part, so do children's place feelings.

Particular care was taken to design techniques which the children themselves could benefit from and enjoy. Fortunately, the school made a large room available to me for the two-year duration of the research. This room became known as "Roger's room," not as a testing room. The activities the children experienced there had to be "fun," in order to engage their full attention and to ensure that they would return voluntarily to the room. It is noteworthy that I could find no literature on the question of how children are originally brought to experimental situations, only how they should be handled in the test situation in order to ensure maximum experimental control.

One of the methods used involved presenting children with an identical battery of color slides of the town in order to ascertain their familiarity with the landscape and is similar to the more common understanding of the word "test." The other two techniques--a clinical method, and a projective technique--are different from what is commonly understood either by the words "test" or "experiment" and must therefore be elaborated.

Piaget's clinical method was devised to study concept development in children. The lack of standardization in this process reflects Piaget's

awareness of the need to prepare questions appropriate to each child's level of comprehension. This is done by first observing and recording children in natural situations. Then, for the interview proper, the clinician introduces the subject of the inquiry very casually and allows the child to talk. He or she observes the way in which thoughts unfold, and, with great empathy for the child's way of thinking, pursues leads provided by the child with questions introduced in a conversational manner. This approach, according to Piaget, requires months of training, but it was used in modified form as a "place knowledge" procedure.

Another procedure used in this research, entitled "Free Landscaping," is similar to the projective techniques used by psychologists to study personality. The originator of these techniques described them as designed to:

" . . . induce the individual to reveal his way of organizing experience by giving him a field (objects, materials, experiences) with relatively little structure and cultural patterning so that the personality can project upon that plastic field his way of seeing life, his meanings, significances, patterns, and especially his feelings." (Frank, 1939, p. 402).

My use of this technique was more specific than the general determination of personality. In an attempt to discover children's feelings for places in the landscape--existing, imagined, or desired--I planned to have them rebuild, in a sandbox, the village as they would like it to be, adding places around it as they desired. It was assumed that in this rebuilding, much of the child's affective relationship to places would be revealed by the inclusion, exclusion and/or relative spatial placement of landscape elements. Unfortunately, time prevented me from proceeding beyond the pilot testing of this procedure.

The Specific Procedures

A chronological account of the procedures used is provided in Table 3-2. A period of familiarization with the people and with the landscape necessarily came first. This began during the first fall in the town while I conducted a census and made maps of the town (the existing census and small-scale maps were entirely inadequate for this research). Once I had produced the maps from aerial photography, the seasonal surveys of children's activities could begin, but not until the spring did I know all of the children sufficiently well to be able to identify them from a distance by name. Therefore, although from the beginning of my stay in the town I had spent time with the children, it was not until I had completed the modeling exercise with all of them that I could work on other aspects of the research in a direct manner. The sequence of administering the procedures had to be tailored to suit the school's vacation schedule, but, more importantly, I had to avoid having some of the procedures influence others. It was particularly important, for example, that each child's landscape model of the town be free from any learning that might be transmitted

TABLE 3-2

CHRONOLOGICAL ACCOUNT OF PROCEDURES USED IN THE FIELD

Oct. '71	Census of village pop. by age, sex and occupation	Town children
Nov. - Dec.	Meeting children, making preliminary observations, and pre-testing the survey of children's activities	Town children
February '72 2 weeks	Child Activity Survey - winter	Town children
March - April 8 weeks	Landscape Modeling exercise	Town children
March 3 days	Winter Play Place Drawings	Town children
April - May 1 week	Child Activity Survey - spring	Town children
May 4 weeks	Place Familiarity exercise - color transparencies	Town children
June 1 week	Children's Activity Survey - summer	Town children
June - July 2 weeks	Range Restrictions interview structured	Sub-Sample
July 2 weeks	Geographic Diaries	Sub-Sample
Aug. - Sept. 6 weeks	Place Feeling Expeditions (photography)	Sub-Sample
Sept. 3 days	Summer Play Place Drawings	Township Children
Sept. 21. (cancelled due to bad weather)	"Free Landscaping" in the Sandbox	Sample pop. (one child only)
Sept. Weekend	Weekend Geographic Diaries	Town children
Sept. 1 week	Place Familiarity exercise #2 - aerial slides	Sample pop.
October 1972 1 month	Range Restrictions interviews	Town children
Nov. - 1 week 1 week	Parents' questionnaire	Parents of sample pop.
Nov. 1 week	Child Activity Survey - fall	Town children
Spring '73	Landscape Modeling - follow-up exercise	three children
Spring and Summer '73	Pursuit of unanswered and new questions through individual interviews of children and parents	Town children and parents

through other research procedures such as the aerial photographs.

Each of the specific procedures used and the problems encountered with them are described in detail, along with the results, in the following four chapters of aggregate data: Spatial Activity, Place Knowledge, Place Values and Feelings, and Place Use.

PART TWO: Aggregate Data

This first section of the research findings deals entirely with aggregate data, that is information which was collected with all of the town's children and then quantitatively analyzed. It is necessarily broken down into four categories of information reported in four chapters. There is no absolute necessity to the order of these chapters. It can be argued however that the description of spatial exploration is quite rightly placed first (Chapter IV), being the prime source of place knowledge. It describes children's ranges of spatial activity away from their homes and the dynamic set of forces which influence these ranges. Chapter V describes the children's knowledge of places and their mental organization of the spatial relationships of these places. Place Feelings and Values (Chapter IV) follows as an evaluative overlay upon this discussion. The final chapter (Chapter VII) is concerned with children's use of places for it is ultimately the intentionality we have toward places which define them for each of us.

Together, these four categories of research represent the sum of our experience of place. However, as a result of working with large numbers of children the truly personal aspects of place experience, including place imagination, are excluded from this section. Attempts to ammend this weakness are made through the family studies of the subsequent section (Part Three) and my personal reflections on my own childhood geography (Appendix F).

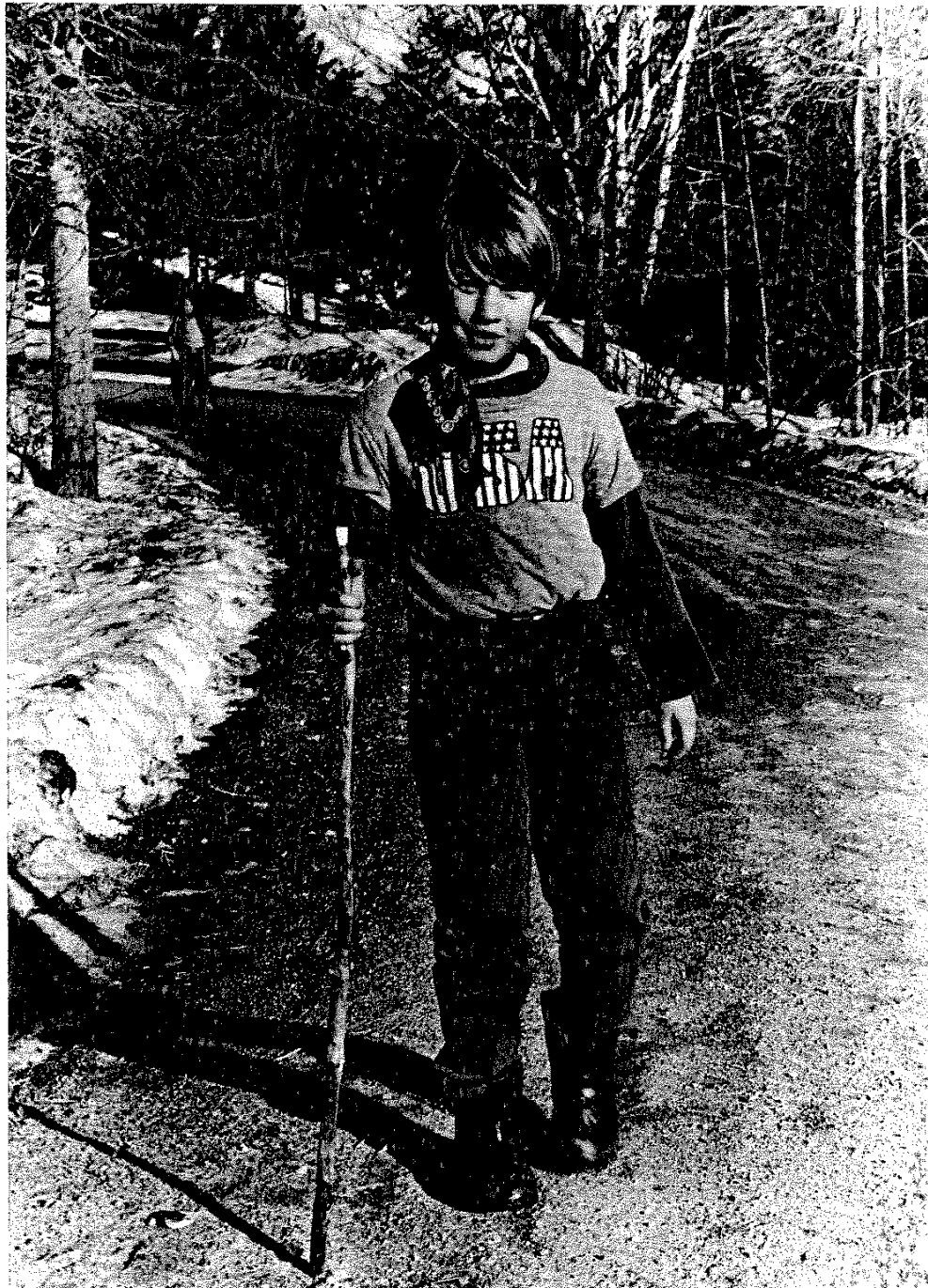


PLATE IV

"Children seem to find as much enjoyment in getting to places as they do in being there. In fact, there often is no 'there'; they are just exploring."

CHAPTER IV. Spatial Activity

'A psychiatrist speaking to a 36-year-old patient:

"Where would you go if your mother said you could go anywhere you wanted?"

"I'd go to the jungle in Africa and hunt lions."

"What stopped you?"

"My mother wouldn't let me cross the street!"

"What was the happiest time in your life?"

"When my mother first let me cross the street."

This joke, recounted to me on April 15, 1972, by Tom (eight years) was taken from a TV show called "Popcorn Movie" with Jerry Lewis. This was three months before any of my attempts to investigate children's spatial activity and access to places. That he should understand and find humor in the joke is not surprising, for children's dreams of distant places and the reality of a limited spatial range that can only be gradually extended, is a situation all children face at some time or other. This section of the investigation documents the patterns of children's spatial activity and the major forces influencing these patterns.

Procedures

Information concerning children's spatial activity was gathered in three ways: interviews with children and parents, geographical diaries maintained by the sample population of children, and informal observations made throughout the period of the study.

In order to provide an account of the spatial activity of children, it is necessary to keep records of individual children's movements. Parents, high school students, and the children themselves were each considered as possible sources of information.

Studies reported in Appendix A-1 found mothers' views on where their children play to be inaccurate. This was confirmed through early observations and discussions in the town. Furthermore, such data would alone be too general; I needed specific information on where the children go. If the mother is inaccurate we may be sure that in the majority of cases the father would be even more so. The possibility of senior and junior high school students who live in the town keeping personal records from their homes and from their school-home journeys was explored, but in such a small town there were too few really interested students to span the town area. As for the children themselves, there are great difficulties in asking children of this age to generalize accurately upon their spatial activity. The oldest children would be capable of keeping diary records, but it is unlikely that even they would be sufficiently interested to complete them on a daily basis. In view of the above problems, I designed a new kind of

diary, a "Geographic Diary," made visually interesting through the use of vertical aerial photographs. Since this required daily personal supervision by me, the procedure could only be used with the sample group of children in Inavale. It was possible, however, to interview all of the children about the restrictions placed upon their movements.

Geographic Diaries

Purpose:

To describe the range of places visited, the means of transport, the accompanying persons, and whether or not the trip was directed by adults, as each of these varies with age, sex, and, in some cases, with the location of the home.

Data Collection:

Each of the children of the sample was given a Geographic Diary consisting of seven identical aerial photographs of the town, headed consecutively with the days of the week. Each aerial photograph was accompanied by a sheet divided into three columns to record "where I went," "who I went with," and "what I did." Two colored felt pens were provided to record on the aerial photographs the routes followed on foot or on bike (red) and the routes followed in a vehicle (green).

Diary-keeping was staggered over four weeks so that I did not have more than ten children at a time to work with. This gave me sufficient time to visit all of the children at midday and between 5:00 and 7:00 p.m. each night in order to help them complete their diaries. This work was usually carried out on door stoops. Children of third-grade level and under required my direct assistance in recalling and recording their travels of the day; fourth and fifth graders simply needed to be reminded of the task. In order to make the seven days of diary-keeping as comparable as possible between children, rainy days and overnight stays outside of the town were excluded from the records. A complete diary was made up of the first five fair-weather week days, plus a non-rainy Saturday and Sunday. On rainy days almost all activity was confined to the interior of homes. These activities, though interesting, were not centrally relevant to the goals of the present research.

Because I had been able to work with only 26 children on the week diaries, I decided to work with a larger sample population when the children returned to school. I asked the parents to assist their children in completing a diary record for one Friday after school and the following Saturday. A total of 66 Weekend Geographical Diaries were completed by the children of the township.

Data Analysis:

By mapping each child's movements away from the home for the entire

week, I obtained a pattern of that child's summer pattern of spatial activity. This is used in combination with all other data when discussing individual children. In addition, four simple analyses were performed on the data for aggregate comparison by age and by sex. First, the maximum daily distances traveled by self-locomotion were estimated for each child and a mean maximum daily traveling distance was calculated. This was then used for gross comparison of children's spatial activity. Second, the number of journeys away from the child's home was calculated and compared. Third, the proportion of journeys away from home which were in an automobile, accompanied by an adult but not in a vehicle, accompanied by an older child, and alone or with peers, could be analyzed and compared. Fourth, the journeys that were directed by adults were distinguished from, and compared with, the number of journeys that were undirected.

Problems with the Method:

The major drawback of this method is that it is time-consuming for the investigator and for the children. Consequently, only one week of good weather days were recorded by all children of the sub-sample, though a number of very interested children continued for two to three weeks and would have done so for longer had I been able to give some of my time to them.

Parentally-Defined Range

Parents' restrictions on their children's activities extend beyond simple limits upon spatial range to restrictions in the use of particular places and objects, and to play with particular children. This chapter is concerned with range restrictions only.

The specific activity restrictions are an important influence on the configuration of parentally-defined ranges. However, this only becomes clear through the detailed analysis of the dynamics behind individual children's parentally-defined ranges, to be described under "The Family Studies."

A thorough review of the literature revealed very little research on this subject. It was limited to the inclusion of one or two questions at the most, in interviews with mothers on their general child-rearing practices (Appendix A-1). Early observations confirmed the suggestions of others (Chapter III; Appendix A) that the parents played an important role in influencing their children's spatial activity. However, work with the children revealed considerable discrepancies between the rules as stated by parents, as followed by children, and as executed by the parents. I, therefore, designed a brief interview to be used with all of the children and a detailed interview with the parents of the sub-sample. Because I thought the children might see this as a possible betrayal by me of their observed activities, I reserved this interview for the end of the research program.

Purpose:

To discover some of the forces lying outside of the child which directly influence his or her spatial activity and use of the landscape.

Data Collection:

1. Interview with the children. All children of the town were thoroughly familiarized with oblique and vertical aerial photographs of the town and were then shown a print of an 11" x 18" vertical photograph. After spending a few minutes exploring this photograph, each child was asked questions while I recorded the information with various colored pens on the aerial photograph and on an accompanying card. In order to draw the boundaries of the restricted areas with accuracy, the children were challenged to recall in detail the markers of these boundaries. The precise instructions were as follows:

"Tell me all the places you are allowed to go to from your home; and I shall color them in on this photograph for you:"

1. Without having to ask permission or tell someone each time. (red)
2. Alone, but with permission or having to tell someone each time you go. (blue) Is cycling any different? (dotted blue)
3. With permission and with other school children. (black) Is cycling any different? (dotted black)
4. Show me any places you would really like to go to alone but which your mother or father does not allow you to go to now. (green)

Occasionally a child would explain that they rarely go anywhere alone but always with their brother or sister. In the case of question 1, I would clarify the question by explaining that as long as they do not hav to obtain permission or tell their parents each time, it does not matter that they are usually with their brother, sister or neighbor. Questions 2 and 3 were maintained, for though one or two children said they almost always go to places with their brother or sister, they could nevertheless easily recall and distinguish the furthest places they had ever been allow to travel to alone and "with other children."

A few children, largely girls, said in response to the "free rang question that they always tell their mother when they go somewhere. In such cases I clarified the question by asking where they may go when no adult was around or when they just say, "I'm going out."

Occasionally children are carried to places in their parents' car and then allowed to roam away from that place, e.g., grandparent's home or the Universal Supermarket. In such cases, the information was recorded in detail, for while it could not be included in the aggregate analysis of ranges away from home, it must be included in the detailed discussion of children's spatial activity.

2. Parental interview. As part of a long questionnaire, the parents of the sub-sample children were asked a variety of questions on the restrictions they place, and have placed during the previous year, on their children. This questionnaire was conducted at the parents' homes either when the children were at school, or when they were in bed. Both parents were present.

Data Analysis:

Straight line distances between each child's home and the furthest point on each of their ranges is the most suitable measure for comparison of the three ranges. Measurement of the size of the "free range" areas can only be made with the youngest of the three grade levels of children. After grade two, many of the children, and especially the boys, have their range defined in terms of specific places such as the "Candy Store" or "Rob's house," rather than areas such as "on the hill," or "anywhere in our back-garden," etc.

Occasionally, when both parents work or are away, range rules are administered by an elder sister. Any such places that require the permission of the elder sister are considered outside of the "free range" and within the "range with permission." There is sufficient data from this methodology to break the population down in terms of age and sex, and to compare the means for each of the three different types of ranges using a t-test (Tables 4-1 to 4-3).

Occasionally, mothers allow their children to visit another child's home with the knowledge that any activity away from that place will be subject to the rules of that other child's mother. In such cases, the child's range is measured from the home to the door stoop of the other child's home. It would be too complex to compound the calculation by taking into consideration the range away from the substitute caretaker's home.

Because of the small size of the sample, the parental interview data is used simply as a check upon the information given by the children and for a more detailed examination of the dynamics involved in parental range restrictions than could be offered by the children.

Log Records

The diary data better reveals the specific patterns of activity-- and what parts of the parentally-allowed range are actually used to what degree. However, the diaries were maintained for too short a period of time to serve as a check upon the functioning of the range restrictions. I relied upon the log records over the two years for detailed observations of the breaking of range and its consequences, and for such interesting issues as the use of "secret pathways," "short cuts," and the habituation of routes and patterns of activity.

Findings

Age-Related Differences

Parentally-defined range--introduction:

"I suppose most boys tried to fool their mothers. I tried to fool mine (1)." (Clemens, 1917)

So wrote Mark Twain in his autobiography. I did find examples of children fooling their mothers concerning their movements, but usually not for long in any consistent manner without being found out. Sometimes children are able, by breaking a rule, to demonstrate to their parents that they can handle some places previously thought undesirable, such as the stream or tree that had been considered difficult to climb. But commonly the breaking of range rules is met with punishment, usually "grounding," in which children are required to remain indoors for some specified period, often more than a day. It is for this reason that, while the parentally-defined ranges are usually representative of the outer limit of children's patterns of movement, the reader should bear in mind that these ranges are by their very nature boundaries of conflict between the world that has been explored and the world that remains as an attraction to a child's exploratory urges.

In my early conceptions of children's range, I saw the parents as a constraining force and hence proceeded to question the six pre-test children about parental "restrictions." It quickly became clear, however, that while parents certainly had the final deciding voice, the definition of the range was often a shared one--a product of negotiation and understanding between parent (usually the mother) and child. From his detailed observations of mother and infant, John Bowlby has shown us that the responsibility taken by mother and by child for maintaining the bond between the two of them varies--among other things--as a function of the development of the child (Appendix A-1). My informal observations and discussions with parents and children have shown me that the responsibility for maintaining attachment varies greatly between the families and between the individuals of my research (older than Bowlby's infants). Unfortunately, I only collected data systematically with parents of the sub-sample of families and can only comment informally on this interesting issue. My new awareness of the importance of negotiation led me to revise my conception of parental "restriction." I amended my interview on range to read "without having to ask permission or tell anyone each time."

Of the four questions on parental range, the first two (1) Free Range ("alone without having to ask or tell anyone each time") and (2) Range with Permission ("with permission or telling someone each time you go") are the most useful questions for comparison by age and by sex. All children

1 While not every boy is like Tom Sawyer or Huckleberry Finn, as will be discussed in a subsequent section, the breaking of range rules more strongly conforms with the socialization of boys rather than girls.

understood them and were able to discuss them with me. The third question on range, "with other children, with permission" was answered by most children, but a few children had no friends of similar or older age residing nearby, and the question held no relevance for them. The fourth question, "where you would like to go alone but which your mother or father does not allow you to go," was dropped because it did not seem to be tapping anything the children had thought sufficiently about or could easily bring to mind. This made it particularly susceptible to influence by previous questions in the interview regarding "favorite places," a result of which was my commonly obtaining a repeated set of answers.

Parentally Defined Range -- "Free Range":

Map Figures 4-1 through 4-6 show the free ranges of girls and boys for each grade level. A simple analysis was made of the child's home to the furthest point on each range. These measurements were made on a large outline map of the town and converted into yards. The averages are compared by grade level in Table 4-1. In addition, a t-test was made to measure the significance of differences between the averages of these unequal sized groups (Table 4-1). Grade level is used rather than chronological age level, because I noticed that both parents and children discussed activities and freedoms in terms of grade level such as "when you're in fifth grade, you can cycle down to the store like so and so," etc.

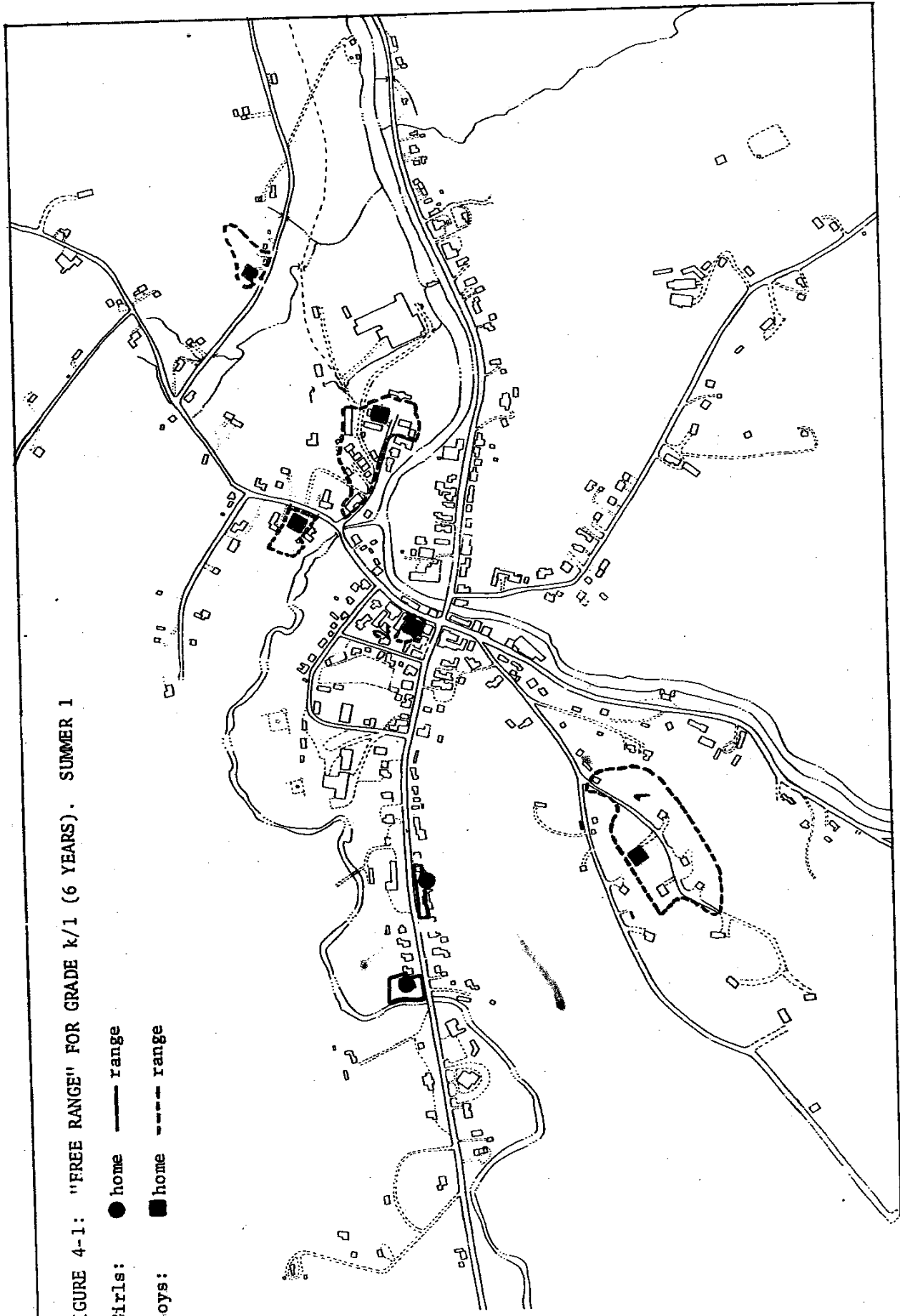
TABLE 4-1
PARENTAL RANGE RESTRICTIONS: MAXIMUM
DISTANCE OF "FREE RANGE" -- t-TEST

GIRLS			BOYS		
GRADES	N	Mean of Maximum Distances (yards)	N	Mean of Maximum Distances (yards)	t
1-3	13	125	21	267	2.943*
4-6	16	310	14	749	3.589*

* p = < .01

FIGURE 4-1: "FREE RANGE" FOR GRADE K/1 (6 YEARS). SUMMER 1

Girls: ● home — range
Boys: ■ home - - - - range



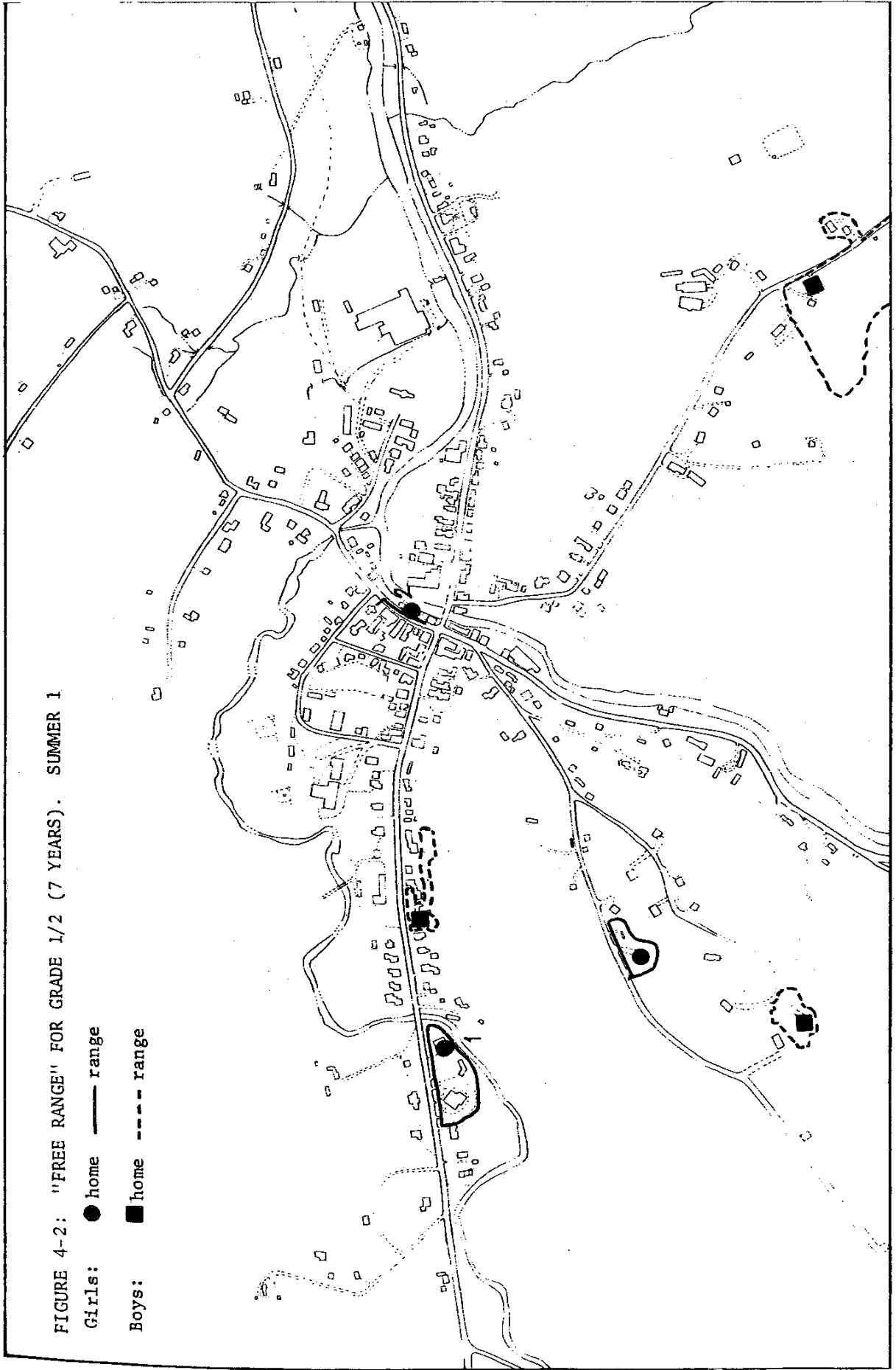


FIGURE 4-3: "FREE RANGE" FOR GRADE 2/3 (8 YEARS). SUMMER 1

Girls: ● home ——— range

Boys: ■ home - - - - range

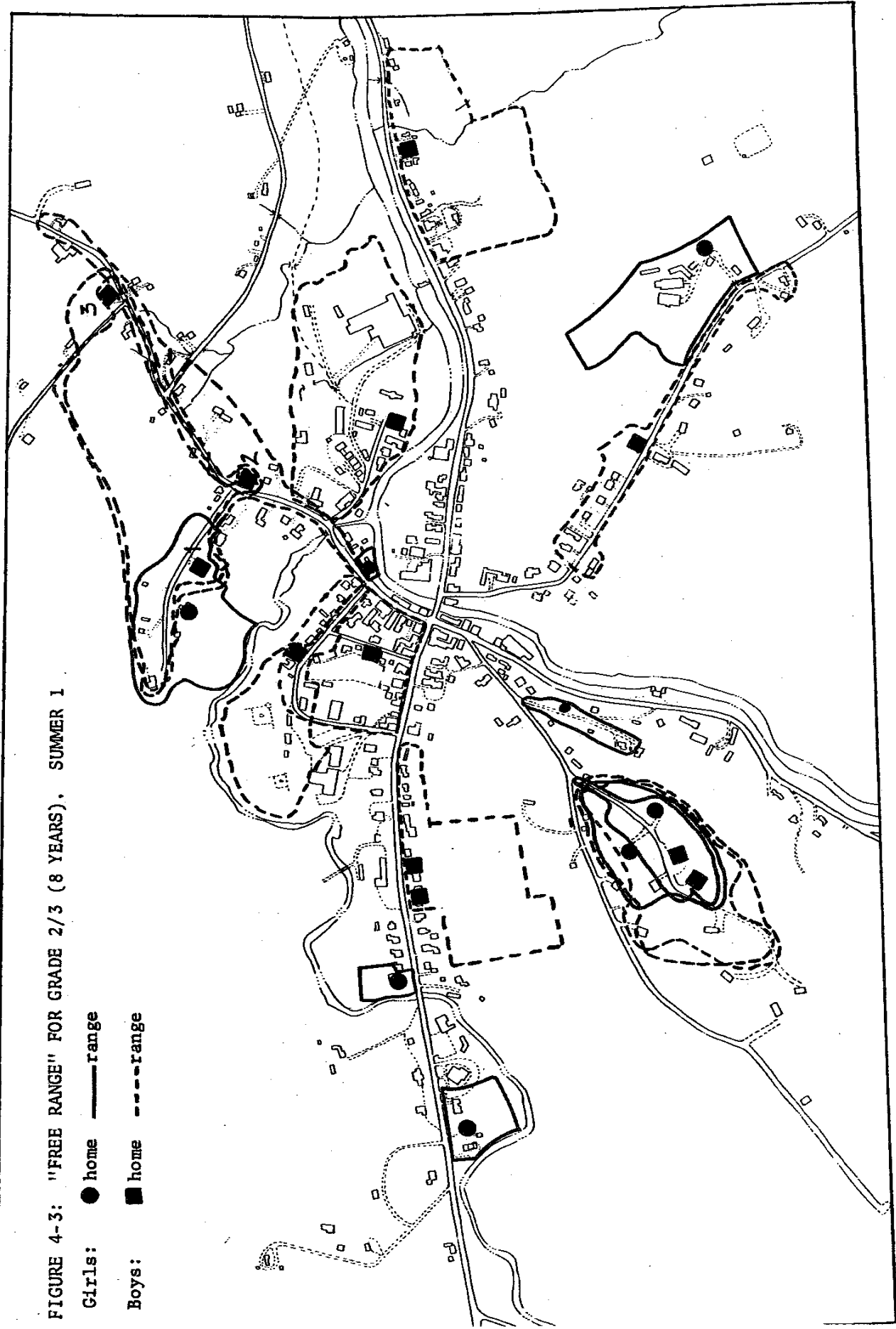


FIGURE 4-4: "FREE RANGE" FOR GRADE 3/4 (9 YEARS). SUMMER 1

Girls: ● home — range
Boys: ■ home - - - - range

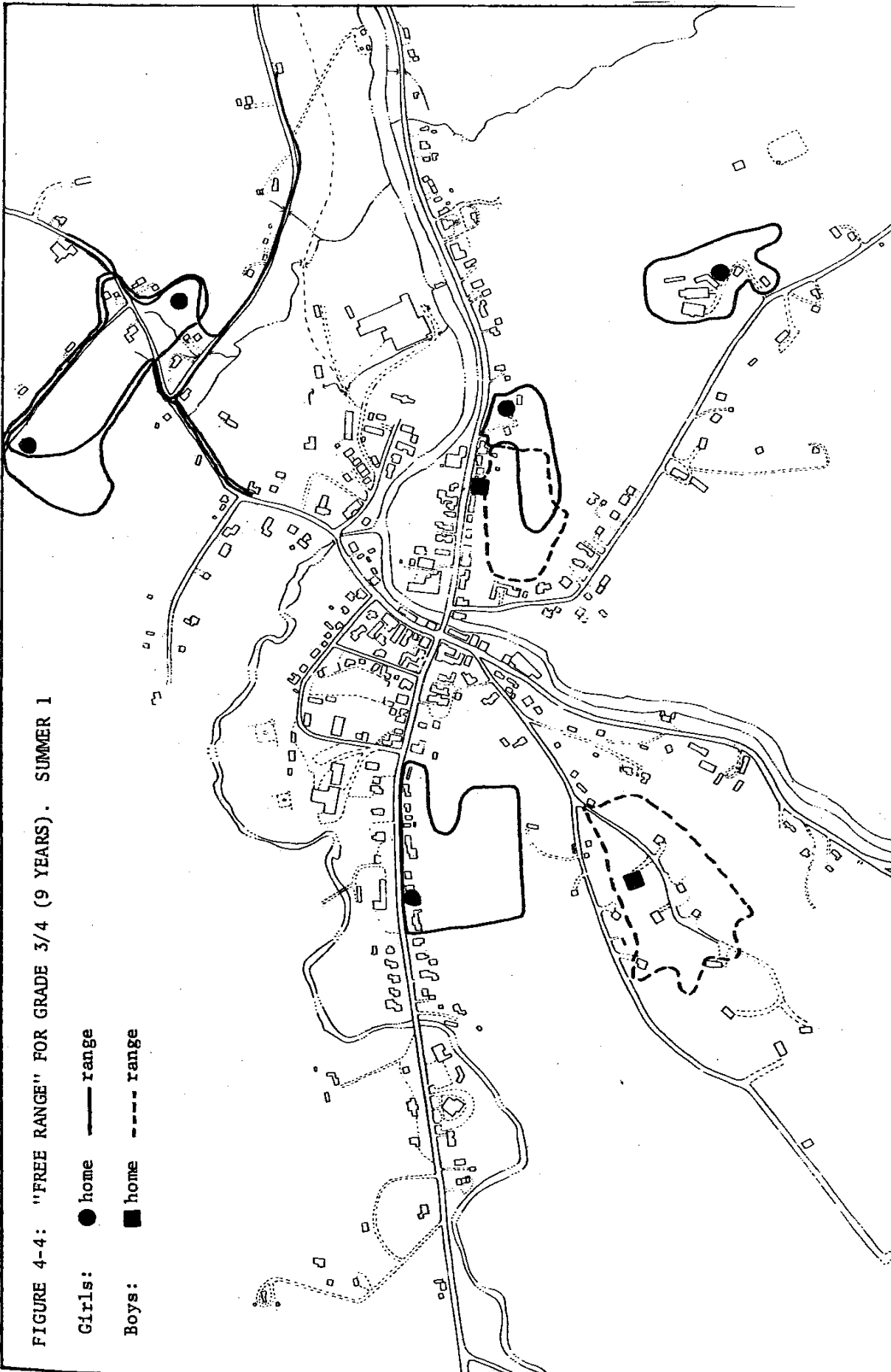
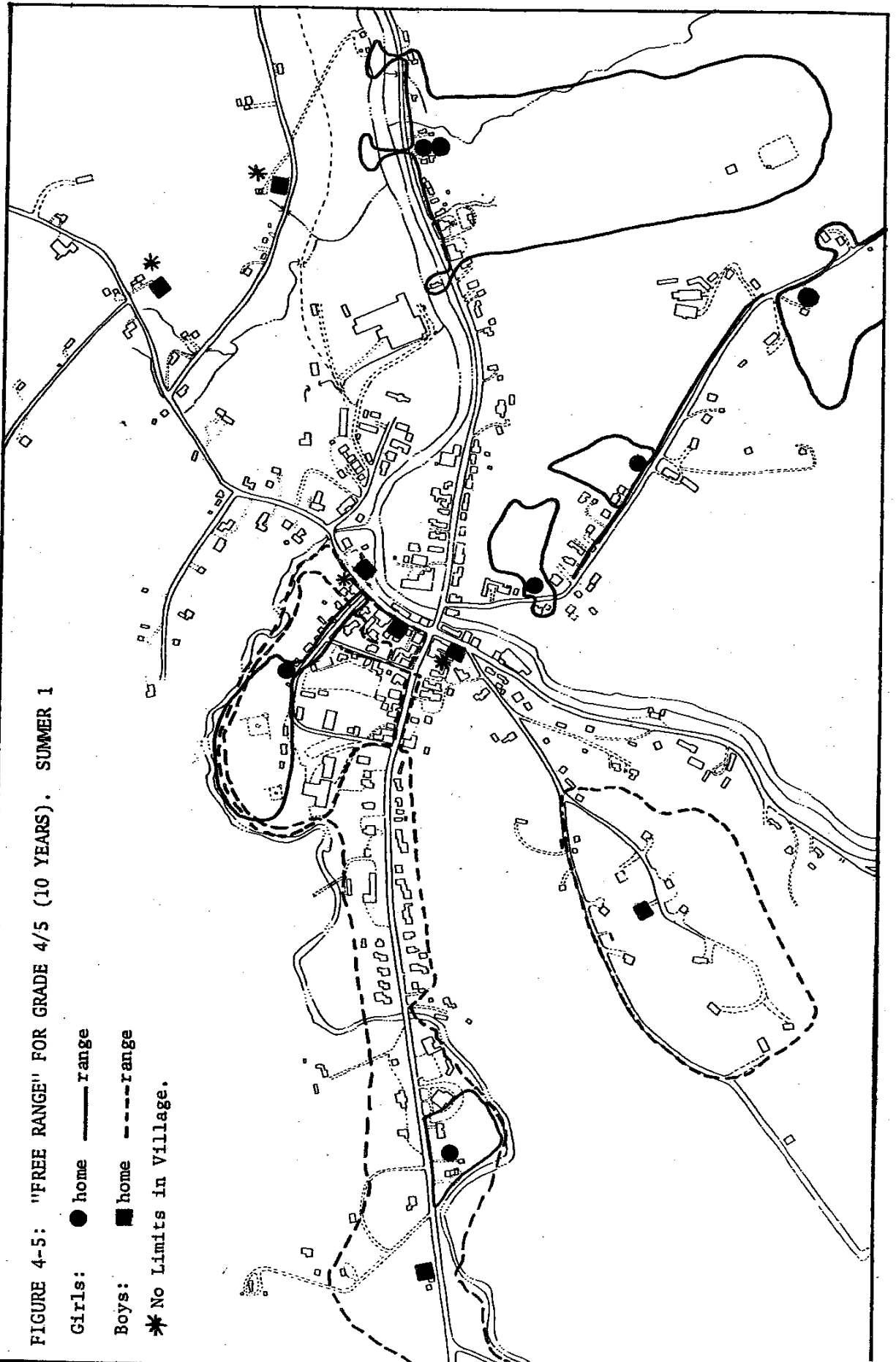


FIGURE 4-5: "FREE RANGE" FOR GRADE 4/5 (10 YEARS). SUMMER 1

Girls: ● home ——— range

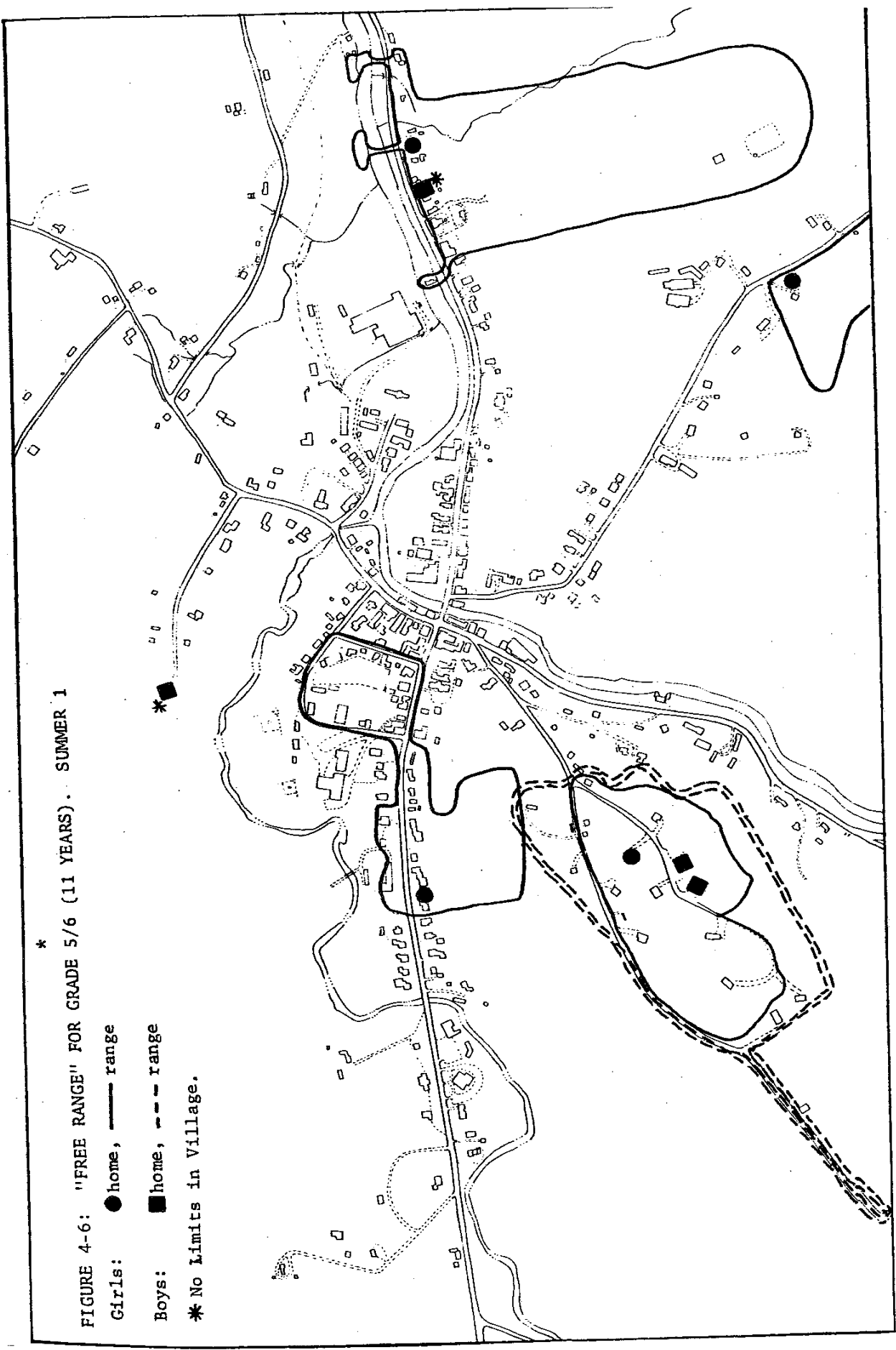
Boys: ■ home - - - - range

* No Limits in Village.



*
FIGURE 4-6: "FREE RANGE" FOR GRADE 5/6 (11 YEARS). SUMMER 1

Girls: ● home, — range
Boys: ■ home, - - - range
* No Limits in Village.



Unfortunately, no data were systematically collected regarding the range of children who had not yet entered school. The youngest age group available for statistical comparison is that of six-year-olds who had just entered grade one when interviewed in September 1972. My impression from informal observations is that children's ranges in general grow rapidly during the kindergarten year. This is related, I believe, to the development of social contacts in school, both by children and by their parents. Also, the normative developmental literature describes a "new sociability" for this age group: a general growth of interest during the sixth year of life in play with other children (cf. Gesell in Appendix A-1, Table A-1). But it is quite likely that this maturational jump he describes is simply a result of the school experience. Whatever the reasons, Gesell's observation is confirmed, that at six years of age, the "neighbor's yard may be more attractive than his (the child's) own" (Gesell in Appendix A-1, Table A-1). Nevertheless, a child's "free range" remains very small. The average in the town for grades one and two is around 100 yards (Graph, Figure 4-7). This distance is related to the mother's desire to see or hear her children at all times, a factor which the children themselves are aware of. Some mothers of even older children use this as the criteria for determining spatial range. One fourth-grade girl, Dorothy, in describing her free range around her home on Plum Hill, explains:

"We can play in the driveway and around the hen houses. We can't go in the field 'cause once Joseph and I went to the brook, and we couldn't hear her (mother) shouting, and she was ever so worried; we were by the waterfall and we couldn't hear."

The shape and configuration of children's "free ranges" at this age are at least as revealing of the important factors affecting parental control of spatial activity as are simple metric comparisons. The shape and size of these ranges reveal not only the mother's visual and auditory access to the child, but also the parent's attitude to the specific dangers and disliked elements of the environment. With young children, the parent's two prime fears are traffic and the river. These various fears combined to operate, for example, on the first-grade boy living on Greenlawns Hill. His free range is quite easily the largest for his grade, extending to four homes (Map Figure 4-1, No. 1). The unobstructed view across lawns (combined in this case with the knowledge that other mothers are also watching out for their children) looks out on a lane free of all vehicles bar those of the parents themselves, and of very infrequent visitors and deliveries. It should be noted here that a few children almost always have older brothers, sisters, or friends outside, and so, while they and their parents describe the "free range" honestly as the range "alone," it may be that this range is a little more liberal simply because the mother knows there are always other children "around." This is particularly true of Greenlawns Hill children, and is another factor influencing their liberal range.

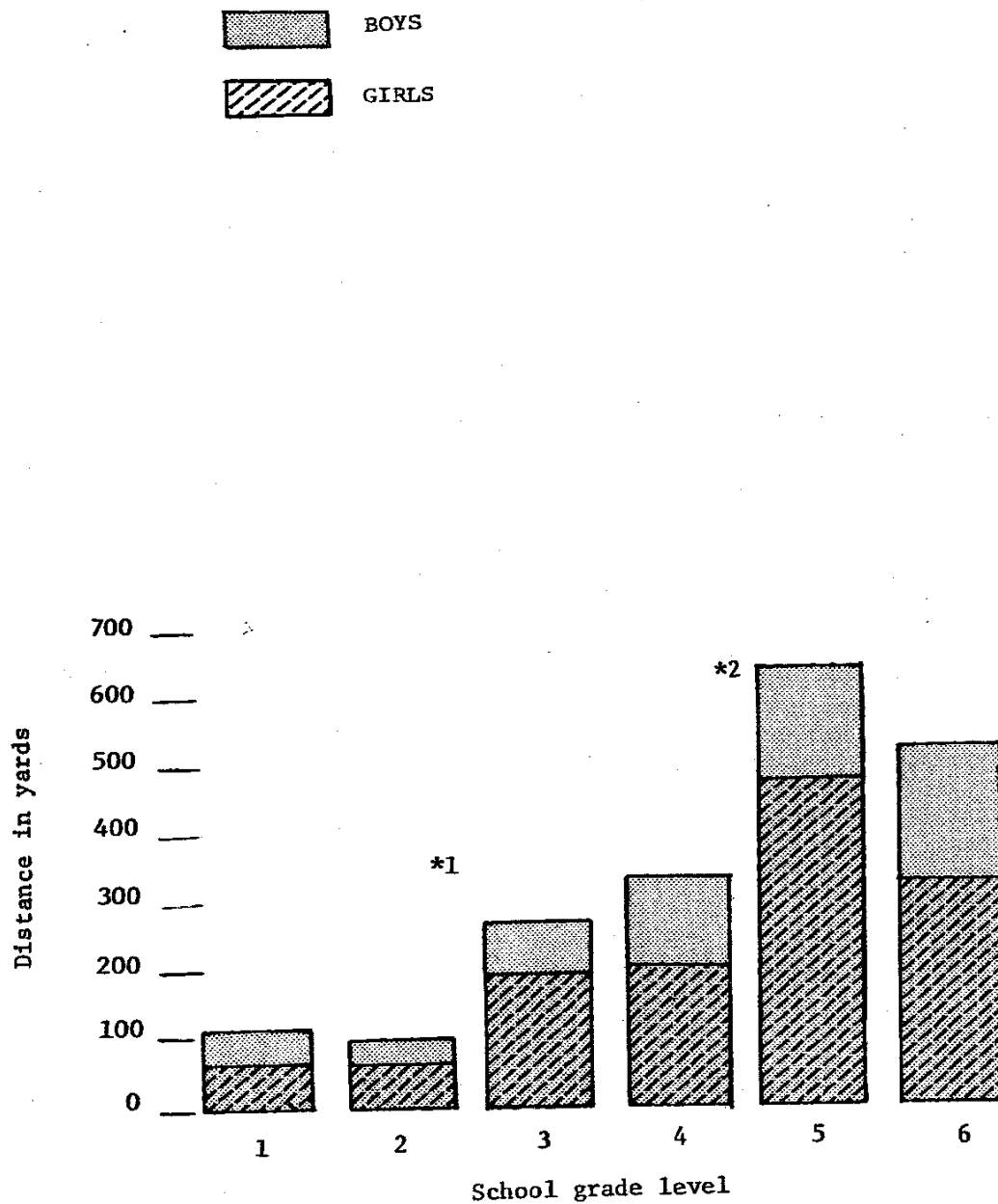
For comparison, the boy living in the center of town, a hundred yards from the crossroads, is constrained by his mother's extremely limited visual access due to a dense conglomeration of buildings, combined with proximity to a very busy highway and a steep drop to a relatively deep river (Map, Figure 4-1, No. 2). These same factors may be seen

to be operating on the ranges of children in grade two (Map, Figure 4-2). The girl living on the western end of West Main Street for example is allowed to cycle around the church, but she explains quite clearly that she cannot dismount on the side facing away from her home because her mother who watches from the window, would not be able to see her (Map, Figure 4-2, No. 1). This relatively large range again compares favorably with a girl living in the center of town (Map, Figure 4-2, No. 2). She has a short strip of sidewalk along which she may walk, but not ride a bicycle. Her range is linear, because she has very strict instructions not to climb over the fence which bars access to the river or to cross the street without asking permission. No children of grades one or two may cross any of the paved roads in town without first telling a parent. Three of the cut-off dirt lanes, on North Hill and on Greenlawns Hill, have "Children Playing" signs, notices revealing that, although the parents have been able to liberate their children's ranges, they by no means feel comfortable about the traffic.

The first significant increase in the average size of free range is found between grades two and three (Graph, Figure 4-7). Three third-grade children, all boys, are allowed to cross the paved road quite freely. According to the normative developmental literature (Appendix A-1; Table A-1) and confirmed by my own observations, children of this age, more than ever before, want to play in groups; their new interest in organized sports and games demands it (see Chapter VII, Place-Use). In addition, I found that third grade (nine years) is the earliest age that parents allow their children to ride bicycles on sidewalks and roads. Three boys of North Hill may now cycle freely between each other's homes, though two of them are required to walk a certain steep section (Map, Figure 4-3, Nos. 1, 2, 3). During the previous year these boys had been limited in their choice of playmates to brothers, sisters and friends much older or younger than themselves. This new freedom, to use the bicycle beyond the home neighborhood, is not extended to any of the children of Plum Hill and Greenlawns Hill. The factors given by the parents of Greenlawns Hill and Plum Hill are the severity of the grade and the bends of their roads. It must also be noted that the 17 children of Greenlawns Hill have no difficulty finding sufficient playmates and hence do not have the same cause to "negotiate" an increased range for this purpose. In contrast, North Hill has both tributary roads running perpendicular to the slope, a more gentle grade, and a shortage of playmates. Three of the five boys of the third-grade level living on the hill are allowed to ride their bicycles between friends' houses lying on the road which climbs the hill. Notably, none of the seven third-grade girls in town are allowed to travel freely beyond the immediate neighborhood of their homes.

The pattern remained relatively the same for fourth-grade children (Map, Figure 4-4). Then, in grade five there is a marked expansion in the size of children's "free range" (Graph, Figure 4-7). The map for this grade reveals that this difference may be accounted for largely by the dramatic new freedom boys are given (Map, Figure 4-5). For the first time in this series of maps, children's free ranges may be seen to extend across the three major roads in town. Three of the four boys are no longer limited in free range at all (with the exception of cycling on the Snowdon Road). The fourth boy's range would be larger if he had a bicycle to moti-

FIGURE 4-7: FARTHEST DISTANCES OF "FREE RANGES"
 ("without having to ask or tell each time")



Where children's parentally defined range is unlimited the farthest distance travelled alone, as of the time of the interview, was used.

*1 't' = 2.976 (P < .005)

*2 't' = 1.731 (P < .05)

vate negotiation of what at this age is a very easy extension in a boy's "free range": usually a simple matter of letting the mother know at what possible places he might be found should she suddenly require him. Some of the fifth-grade boys claimed that they may even go alone to places well beyond the town without informing their parents, such as the ski center. However, they have never actually done so alone. It seems to be understood by the parents that for such distant jaunts their children choose to be with other children for it was often explained to me: "She knows I'm with my friends." For this reason, the furthest distance any child has actually ever travelled alone within his or her allowed free range is used in the estimation of "mean farthest distance" rather than the farthest distance any child can imagine is within his or her free range.

The major highways are still feared by the parents of fifth- and sixth-grade "cycling" children. River Road, for example, remains restricted for all but the most liberal parents of the oldest boys. But traffic is no longer the major reason given by parents for restricting their children. Social factors, which have been present all the time, become predominant. Parents seem to fear the "bad influences" of other children and the possible undesirable contacts which may be met "downstreet." It is not always clear what the particular feared effects are, but drugs, petty theft, and just "hanging around doing nothing" were all mentioned during the parental interviews. Certainly these parental fears affect girls much more than boys. The free range of the fifth-grade girls is still noticeably oriented away from the roads and toward their local street or the fields behind their homes. Only by sixth grade is one girl free of parental range restrictions. The most noticeable feature of these upper grades is the relatively small size of the free ranges on Greenlawns Hill, a subject which is taken up in the forthcoming section on "Environmental Influences."

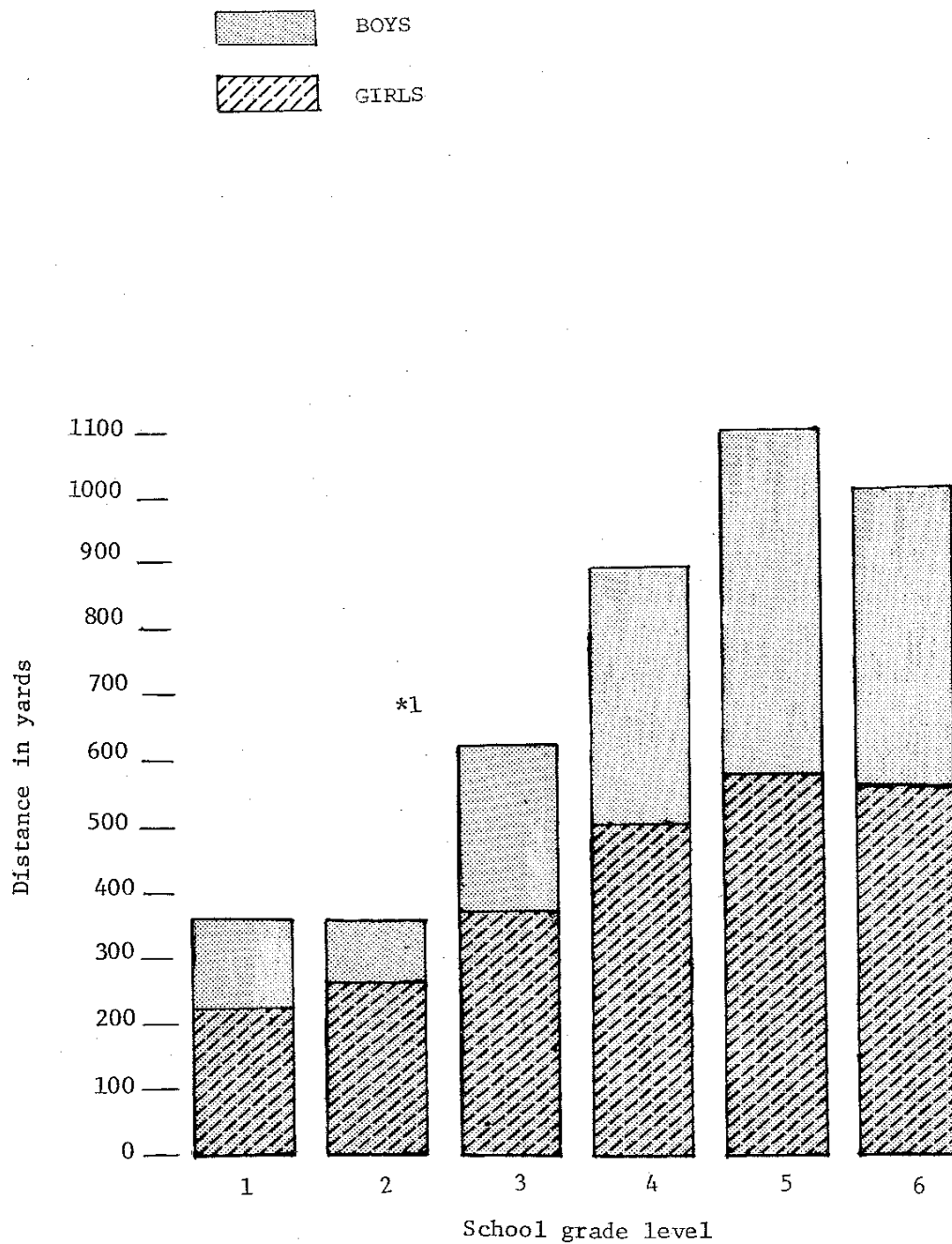
The patterns are of course more complex than this spatial analysis might suggest. Fifth-grade boys do not suddenly achieve complete freedom over their day. It is most common in those families where there is a parent at home for a time limit to be prescribed. The Clark parents of East Main Street, for instance, are keen over the idea of their son hiking up in the fields behind their home, and they voluntarily explained to me during informal conversation how lucky they are that, "all we have to do is state a time and check our watches and off he goes--he's very good and returns on time--we don't have to worry." Similarly, Mike, a sixth-grade boy living on Townview Road may go anywhere, "but not longer than four hours without calling her (his mother)."

Parentally Defined Range--"With Permission"

It is not possible to map "ranges with permission" as it is with the "free ranges" because they are linear rather than area ranges. Though some children can obtain permission to go "downstreet" or around the block, permission is usually granted to go to specific places.

Three important qualifications must be made in regard to the term "with permission." The first, already discussed in the methods section above, is that this category includes those situations where children

FIGURE 4-8: FARTHEST DISTANCES OF "WITH PERMISSION RANGES"



Where children's parentally defined range is unlimited the farthest distance travelled alone, as of the time of the interview, was used.

*1 't' = 1.856 (p < .05)

have to "tell" their parents, and not necessarily "ask permission" to go to certain places. The second is that the "with permission" may sometimes be granted by older children, usually by girls since they are the ones given the task of substituting for the mother in her child-care role. During vacations, some fifth- and sixth-grade girls are given responsibility for younger brothers and sisters on a daily basis, while their mothers go to work or are on shopping expeditions. A third clarification of "with permission" involves caretaking by other mothers. Sometimes a child is allowed to go a considerable distance to another child's home. The mother has no specific knowledge of her child's whereabouts but feels secure because the other mother is known. This other mother takes on the role of caretaker and sets the range for the visiting child as she does for her own child. In my calculations, I have used the original range, as defined by the first child's mother, and not this compounded range of the second mother. As with the free ranges, the mean farthest distance is calculated for both sexes at each grade level and displayed graphically (Graph, Figure 4-8). The pattern is similar to that with free range, but with some important differences. While there is again a marked jump in the size of range from grade two to grade three, the difference between grade four and grade five is not this time as significant (Table 4-2). Furthermore, if one compares the mean maximum distance for boys of grades four, five and six, it can be seen that there is relatively little growth and that the increase between grades four and five is largely accounted for by the increase in girls' range. It seems that boys in fourth grade and over have little desire to go further than their greatly expanded "free range" allows them, unless, as we shall see in the following section, there are other children to accompany them.

TABLE 4-2

PARENTAL RANGE RESTRICTIONS: MAXIMUM DISTANCES OF "RANGE WITH PERMISSION" -- t-TEST

GIRLS			BOYS		
GRADES	N	Mean of Maximum Distances (yards)	N	Mean of Maximum Distances (yards)	t
1-3	13	267	21	673	2.532*
4-6	16	941	14	1,096	1.067**

* $p = < .02$

** $p = < .50$

After school, children are expected to return home, snack, and often change into play clothing before going out to play. A few children are allowed to call from friends' houses, where they stop on the way home from the school bus, to obtain permission to play with a friend. When this is done without permission (something I observed on numerous occasions, especially with second and third-grade children), children are strongly reprimanded and punished, usually by "grounding." When children return home to find their mother or father out shopping, they are expected to remain within their "free range" until one of the parents returns.

Parentally Defined Range--"With Other Children"

It is surprising to find that this range also grows steadily (Graph, Figure 4-9). As with the previously discussed "range with permission," many fifth and sixth-grade boys may go where they choose. I therefore calculated the furthest distance they had ever been "with permission and with other children." Again there are significant jumps between second and third grade, and between fourth and fifth grade, which suggest the influence of bicycle use as boys enter the third grade, and the dramatic new freedom which seems to be given to ten-year-old boys as they approach the fifth grade (Table 4-3). By the sixth grade, some of the boys' ranges have become so free that two of them dared to join their seventh-grade friends in hitching down to the Northville Road Beach, two miles out from the town center. I never saw girls younger than eighth grade doing the same, but it is conceivable that some did.

TABLE 4-3

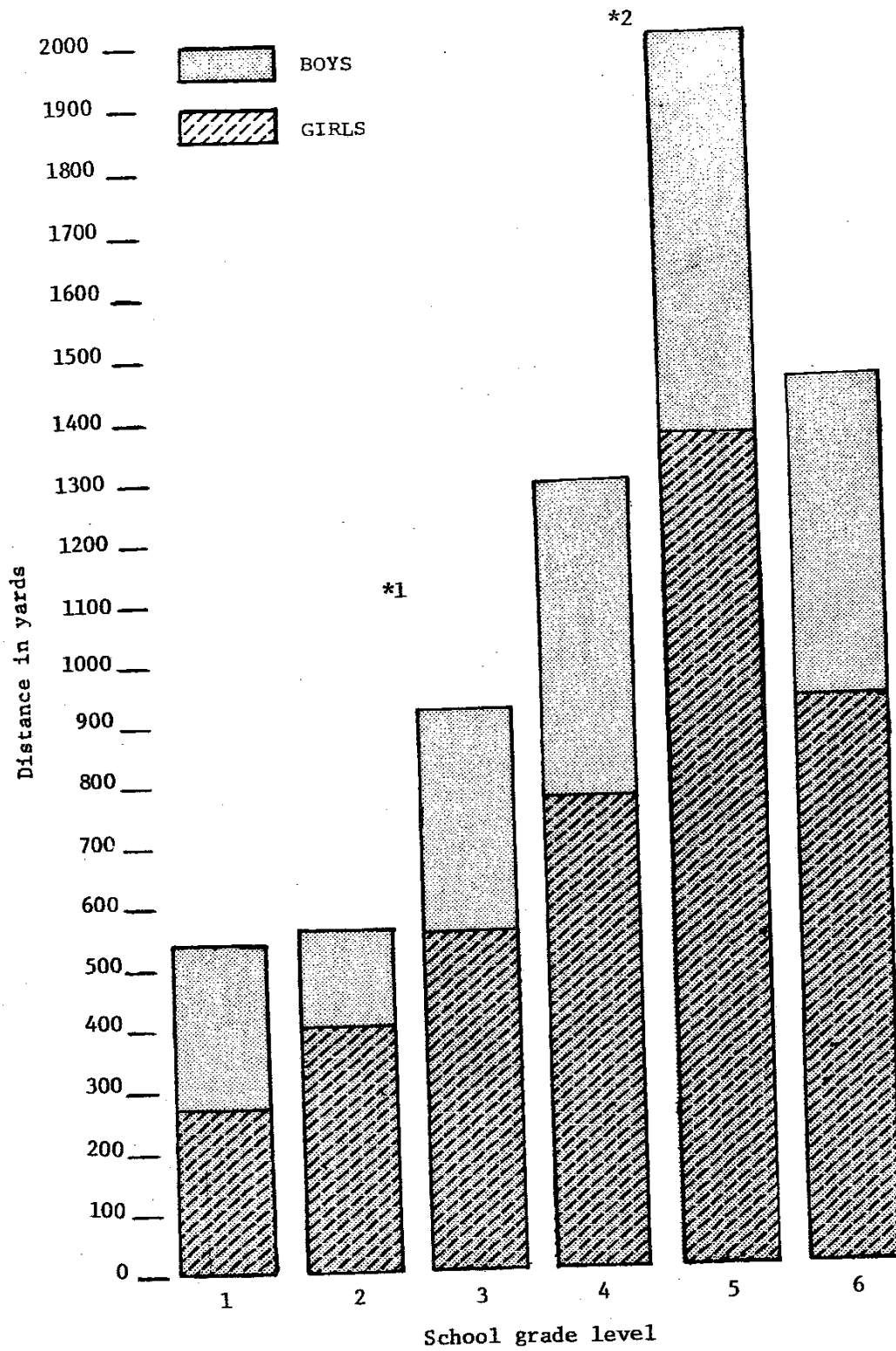
PARENTAL RANGE RESTRICTIONS: MAXIMUM DISTANCES OF RANGE WITH PERMISSION AND WITH OTHER CHILDREN -- t-TEST

GIRLS			BOYS		
GRADES	N	Mean of Maximum Distances (yards)	N	Mean of maximum Distances (yards)	t
1-3	13	611	21	903	2.064*
4-6	16	1,070	14	2,229	3,400**

* $p = < .05$

** $p = < .01$

FIGURE 4-9: FARTHEST DISTANCES OF RANGES
 "WITH PERMISSION AND WITH OTHER CHILDREN"



Where children's parentally defined range is unlimited the farthest distance travelled alone, as of the time of the interview, was used.

*1 't' = 1.975 (P < .05)

*2 't' = 1.727 (P < .05)

Younger children always seem to attempt to tag along behind older brothers and sisters and may frequently be seen watching despairingly as they are left behind when a more interesting peer playmate carries their glorified older sibling away.

Spatial Activity.

Data of the actual distances travelled is provided by the diaries which I kept with the 26 children of the "Family Studies" during one week in July and August. With such a small sample there is no opportunity for age-related statistical comparisons. It is noteworthy, however, that when clustered into two groups of two grades and compared, the greatest difference is found between grades one and two, and three and four (Table 4-4). The difference between third and fourth grades, and fifth and sixth grades, is not as substantial as one might expect in light of the considerable jump in the size of parental range between grades fourth and fifth. This is because there is effectively no increase in spatial range between grades five and six; by fifth grade, children's (especially boys') free range is about as large as the children will experience through their teens, until the next major jump in scale at seventeen, with the acquisition of a car. They have the town available to them; and any other desirable places such as beaches and other towns, are too far away for all but the most energetic. The marked increase in parentally defined range, described above, between grades two and three is far more important to the children. Beginning in the third grade, children may use their bicycles to visit friends and join in games. The town is truly being opened up to them at this age, and they take advantage of it.

TABLE 4-4
MEAN MAXIMUM DAILY DISTANCES TRAVELLED IN YARDS (FROM GEOGRAPHICAL DIARIES)
t-TEST of AGE and SEX DIFFERENCES

	5-9 yrs		10-12 yrs		Total 5-12 yrs		t-test 5-9 yrs vs. 10-12 yrs
	t	n	t	n	t	n	t
Boys	416.16	8	2452	5	1200	13	3.11*
Girls	314	4	959	9	760	13	2.33**
Boys and Girls	382	12	1492	14			3.40*
t-Test Boys vs. Girls	0.5***		3.10*		1.10***		

* p = < .01
** p = < .05
*** p = N.S.

It is also possible to ascertain from the diaries whether or not the children are with parents, alone, or with other children, and whether in the latter two situations their activity is directed or not (working or running errands for parents). Detailed age comparison of the diary data cannot be made because of the small sample and unequal distribution in the ages of children who completed the diaries. Looking at the gross categories, however, there are some marked contrasts. Most of these concern differences between boys and girls to be considered in the following section. Comparing the younger group of children (grades one through three) with the older group (grades four through six), the majority of places are comparable in the frequency of trips made, but the "commercial" places are visited three times as much by the older group of children (Table 4-5). Furthermore, all but three of the 37 commercial trips made by the younger children are made with their parents, whereas 128 of the 144 similar trips made by the older children are made alone or with other children.

Sex-Related Differences in Spatial Behavior

The data and observations of this investigation suggest that the manner with which boys and girls engage with the environment is used by parents and others as a powerful socialization "tool" in the development of sex stereotyped roles. This section deals with just one aspect of these differences, spatial activity.

Parentally Defined Range

Marked differences are found between the spatial range of boys and girls. Boys' parentally defined ranges are larger on each of the three classes of data ("free range," "with permission," and "with others") and on the diary data (Tables 4-1 through 4-4). The mean maximum distance boys are allowed to freely range away from their homes ("free range") is more than twice that of the girls in both the younger and the older grades, a difference which is highly significant (Table 4-1). The picture provided by the mean maximum distances for "range with permission" is different (Table 4-2). While the boys of the lower grades (first to third grade) again have a range more than 100 per cent larger than the girls (significant at .005 level), data for boys and girls of the older age group shows no significant difference. It is not too surprising that girls of these grades have expanded their range relatively more than the boys; girls are expected by fifth and sixth grade to give their mothers considerable assistance, including the running of errands to specific downtown stores. When we compare the different ranges children are allowed to go when "with other children," we find a significantly greater freedom of range for both the younger and older boys (Table 4-3). This difference is 50 per cent greater for the boys of the younger age grouping (significant at the .025 level) and more than 100 per cent greater for the boys of the older age grouping (significant at the .005 level). As with "free range," the divergence between boys and girls in the size of this range with others is greater for the older grouping of children than for the younger grouping. This highly suggestive data of range limitations is supported by analysis of the children's diaries which provide data on actual distances travelled during

TABLE 4-5
WEEK DIARIES - SUMMARY OF ACTIVITY ANALYSIS*

	GRADES 1-3			GRADES 4-6			GRADES 1-6		
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL
LAND-USE									
NO. OF DIARY ENTRIES	84	37	121	81	63	144	165	100	265
% OF TOTAL ENTRIES	70.0%	37.8%	55.5%	50.0%	36.0%	42.7%	58.5%	36.6%	42.7%
COMMERCIAL									
NO. OF DIARY ENTRIES	8	29	37	46	69	115	59	98	152
% OF TOTAL ENTRIES	6.7%	29.6%	17.0%	28.4%	39.4%	34.1%	19.2%	35.9%	27.4%
SOCIAL									
NO. OF DIARY ENTRIES	28	32	60	35	43	78	63	75	138
% OF TOTAL ENTRIES	23.3%	32.6%	27.5%	21.6%	24.6%	23.2%	22.3%	27.5%	24.9%
TOTAL NUMBER OF ENTRIES	120	98	218	162	175	337	282	273	555
	100%	100%	100%	100%	100%	100%	100%	100%	100%
NUMBER OF WEEK DIARIES COMPLETED	7	4	11	5	9	14	12	13	25

* For boys and girls of each age group, the frequency of diary entries for each of the three major categories (land-use, commercial and social), is expressed as a percentage of the total number of diary entries.

one week by 26 children. The mean maximum daily distance travelled by the 13 boys during one week is 1,200 yards compared to 760 yards by the same number of girls. Not too significant a difference until again we separate the children into a younger and older age group. Then we discover that while the younger boys' ranges are not so significantly greater than those of their girl peers, the ranges of the older boys extend to an average maximum distance of almost half a mile; more than twice that of the fourth- and sixth-grade girls (Table 4-4, significant at the .005 level).

The most striking feature of the interviews with the children about parental range restrictions and the one which led me first to notice the many sex differences in this data, was the ambiguity of responses received from the boys as opposed to the girls. Boys describe one boundary and then give the name of another place beyond the boundary. On further questioning, it is commonly revealed that the rules, usually made by both parents, are in fact administered by the mother only and that she often turns a "blind eye" when her boy breaks the boundary: "Well, she knows that I go, but I'm not supposed to." Comments such as this are most frequently made by the older boys in town. Again from casual observations, I noted that if the boy should get into trouble outside of the formally agreed upon range such as falling into the river, he must be ready to be punished. Implicit in this special treatment given to boys by their mothers seems to be the attitude that "boys will be boys," meaning that we must expect them to explore more, engage in more rough play, be more physically active, and even get into trouble more, but that they must expect punishment when caught. Such are the attitudes toward the making of a man.

It seems that the mothers are usually not aware of their differential treatment of their sons' and daughters' ranges. One afternoon when visiting to check up on the diaries of two sixth-grade sisters and their fourth-grade brother, their mother voluntarily commented, "I guess the girls don't get around much compared to Casey." She said this apologetically and as if she had not thought of it before the advent of the diaries.

On discovering markedly greater spatial freedom given to and taken advantage of by boys, I explored the literature on the psychology of sex differences in behavior (1). A recent and very thorough review by Maccoby and Jacklin (1974) found very little difference in spatial activity between the sexes. They referred only to Newson and Newson's study of child-rearing in Nottingham, England (Newson and Newson, 1968), and concluded that the tighter ranges found amongst older girls could be explained in terms of parents' fears of molestation of their children. Maccoby and Jacklin failed to recognize a number of recent studies which, taken together with the data of this study, suggest that the greater restriction of girls is a phenomenon common throughout this culture and probably in other cultures (Tindal, 1971; Nerlove, Nerlove, and Munroe, 1971; Nerlove, 1976,

1 Happily, this developed into a joint project with Susan Saegert, to be discussed in some detail in the following chapter (Saegert and Hart, 1978).

reviewed in Appendix A-1). There is no biological basis for such different behaviors. Somehow they are learned from parents and peers as children begin to take up their roles: the men going out into the world to provide for the home; the women still in large part the homekeepers. Unfortunately, while these studies and many other investigations of different aspects of the psychology of sex differences in children point to differences in behavior (notably the superior performance of boys on spatial ability tests), they choose not to examine or discuss the dynamics behind these differences.

While girls were expected to do more work around the house, boys were expected to mow lawns and run errands for their parents. These within-family early differences in role become formalized by the townspeople beginning in fourth grade as the boys begin to be hired to deliver newspapers and mow lawns while girls are hired as baby sitters. The paper routes are a particularly good opportunity for children to learn about the town, as the boys clearly illustrated in their mapping activities. The effects of these role differences upon the spatial activity of boys and girls is revealed through an analysis of the diary data.

Spatial Activity

There is no significant difference in the average maximum daily distances travelled by the sample of younger girls and boys (grades K through three) according to their diaries (Table 4-4). The older boys (grades four through six), however, did travel further each day than their girl classmates. This finding supports the greater sex difference found in the size of the older children's parentally-defined "free range" and "range with others" data reported above. It seems that although the older girls' "range with permission" is similar in size to that of their male peers because of errand running to specific stores, these distant journeys are made relatively infrequently. They, therefore, did not have an equalizing effect on the diary data.

There are substantial differences in the types of places visited by the girls in contrast to the boys (Table 4-5). Many more "land-use" type places are mentioned by boys. This difference is especially marked in the case of boys and girls when they are alone. Either the girls failed to provide me with as much detail in their diary records, or they do in fact use fewer places out of doors than do boys. Since the girls seemed to enjoy the diary-keeping so much, I tend to favor the latter conclusion. Another remarkable difference between girls and boys concerns visits to commercial places. Girls visited almost twice as many of these places (stores, post office, restaurants, etc.) than did boys. When we look closer at this data, however, we discover that this difference is accounted for entirely by trips with parents, or "directed" by parents; the number of trips made alone by boys and girls are equal, and there is an even slightly larger number of trips made with other children by boys (Tables 4-6 and 4-7). A large proportion (26 of 37) of the girls who visit commercial places with their mothers are of the younger grade levels (Table 4-6), whereas all but one of the 25 "directed" trips made by girls to commercial places are made by girls of the older age group (Table 4-7).

TABLE 4-6

WEEK DIARIES - PERCENTAGES OF TRIPS ALONE,
WITH OTHER CHILDREN, OR WITH ADULTS

	TRIPS ALONE			TRIPS WITH OTHER CHILDREN			TRIPS WITH ADULTS		
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL
LAND-USE ACTUAL NO. OF ENTRIES	91	35	126	63	52	115	4	7	11
% ENTRIES OF TOTAL	57.6	37.2	50.0	39.9	55.3	45.6	2.5	7.4	4.3
COMMERCIAL ACTUAL NO. OF ENTRIES	25	26	51	13	9	22	11	37	48
% ENTRIES OF TOTAL	51.0	36.1	42.2	26.5	12.5	18.2	22.4	51.3	39.6
SOCIAL ACTUAL NO. OF ENTRIES	36	42	78	8	13	21	18	18	36
% ENTRIES OF TOTAL	58.1	57.5	57.8	12.9	17.8	15.6	29.0	24.6	26.6
TOTAL NO. OF ENTRIES	152	103	255	84	74	158	33	62	95
% OF TOTAL NO. OF ENTRIES	56.5	43.1	50.2	31.2	30.9	31.1	12.2	25.9	18.7
NUMBER OF WEEK DIARIES	7	4	11	5	9	14	12	13	25

These trips are usually made for the mother to the post office, a store, or a restaurant. It is surprising that only five such trips were made by boys during this week of diary-keeping. My informal observations had led me to believe that while girls are expected to do more work around the house and to care for the children, boys are expected to run on errands to the stores just as much as are the girls. I think the problem behind this seeming ambiguity is that the situation during the summer vacation (when the diaries were kept by the children) is different from the remainder of the year. During the summer months, many children have less opportunity to make contact with schoolmates than they do during the school year. This is especially so for girls because of their more restricted ranges and their greater amount of responsibilities around the home. It is likely that some of the errands run by girls for their mothers (and subsequently transcribed as "directed" activities in the later tabulation of the data) are in fact initiated by the girls themselves in order to have an opportunity to meet friends along their way or at their destination or perhaps merely to have a chance to journey from their home. A number of these "errands" are therefore relatively unimportant ones such as traveling to the post office twice during one day to check for mail. In such cases, "directed" is too strong a word. Nevertheless, these errands made by the girls are to specific places, and I suggest, are qualitatively different from children's free-choice trips away from the home. If this social isolation hypothesis is true, it would also account for the greater number of "directed" trips to other people's homes (Table 4-7).

TABLE 4-7
WEEK DIARIES - NUMBER OF DIRECTED ACTIVITIES

	GRADES 1-3			GRADES 4-6			GRADES 1-6		
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL
LAND-USE									
NO. OF DIARY ENTRIES	3	1	4	2	0	2	5	1	6
% OF TOTAL	100%	50.0%	80.0%	28.6%	0%	5.0%	50.0%	2.8%	13.3%
COMMERCIAL									
NO. OF DIARY ENTRIES	0	1	1	4	24	28	4	25	29
% OF TOTAL	0%	50.0%	20.0%	57.1%	72.7%	70.0%	40.0%	71.4%	64.5%
SOCIAL									
NO. OF DIARY ENTRIES	0	0	0	1	9	10	1	9	10
% OF TOTAL	0%	0%	0%	14.3%	27.3%	25.0%	10.0%	25.8%	22.2%
TOTAL NO. ENTRIES	3	2	5	7	33	40	10	35	45
NUMBER OF WEEK DIARIES	7	4	11	5	9	14	12	13	25

This data is most provocative but requires further study with larger samples of children. Unfortunately, few studies have considered sex differences in children's environmental behavior. Of those which have, none have gone beyond pointing out differences to suggest the complex dynamics involved. I have not therefore been able to support or negate these hypotheses with other studies. Other data, reported in the various sections of this investigation, however, reveal marked differences in different aspects of girls' and boys' environmental behavior. For this reason, the general discussion is reserved for the summary (Chapter X).

Between-Family Variations in Children's Spatial Behavior

I noted marked differences in the attitude of the parents to their children's environmental behavior and their role as caretakers. It is difficult to know what these differences are related to, even in the best of circumstances, but in this investigation not only did I have no independent measure of parents' personality or child-rearing attitudes, but I was only able to formally interview the parents of my sub-sample. Any generalizations concerning the differences between families are the result of information taken from a mixture of sources: log observations, informal exchanges with parents, the structured interviews with a few parents, and children's comments. They must therefore be accepted as suggestive only.

Whether or not both parents are working all day seemed to be an important factor. Few mothers go to work in the afternoons before their youngest child reaches third grade. Those who do, make very specific caretaking arrangements with neighbors or with a girl of at least eleven or twelve years of age. The most common effect of the mothers of older children being at work and there being no caretaker seems to be an increase in the size of the children's spatial range. The importance of the mother's presence was rather amusingly illustrated to me one day by two fifth-grade brothers. During a general conversation about their activities one summer afternoon, I asked them whether they are allowed to go to the lake to build their raft anytime they want to:

"Yes, but we have to tell Mother anytime we go anywhere now. She used to go all the way to Middleton with my father to work each day but now she works in Inavale and she has a real quiet car so we can never tell when she's coming home."

(RH: "Do you tell her whenever you go anywhere?")

"We do now. We couldn't last year. Now we have to call her up."

(RH: "Do you break the rules sometimes?")

"Sure!" (in unison)

In the case of children of third-grade level or older whose parents are at work during the entire day, an older sibling may be given caretaking responsibility, but commonly these children are left to their own devices. Consequently, unless the parents are extremely strict, they will more

readily extend their range of exploration than if they had to ask their parents each time. This does not necessarily mean that working parents are more lax than others or that children are always sneaky while parents are away. In some cases, it may simply mean that because parents come to see their children able to cope with a larger environment, they can accept the new liberality that has been forced upon them by their going to work.

Another example of how the presence or absence of parents may affect children's spatial range is illustrated in the case of Jim, a third-grade boy who has no mother and a working father. When his father is at home, he explains, he can only play in the field behind their house, on Snowdon Road, without asking his father's permission. He must ask permission even to walk 300 yards up the road to his friend's home. When his father is not home, however, which is usually the case on weekdays after school, he says his father does not mind his going all the way to Meadow Farm alone. I did not interview this particular father, but it appears that with this parent and with others there are different rules which change according to whether or not the parents are at home. It is as though they have come to accept the impossibility of caring for their children while they are away at work and try to make up for it while at home. But this is highly suppositional. There has to my knowledge so far been no study of the effects of both parents having work away from home on children's access to and use of the outdoor environment. Another explanation of why parents might maintain a closer hold on their children when they themselves are at home is because they need to call on them for errands. It is interesting that this same third-grade boy, for example, is only allowed to use his bicycle to go to the stores in the town center when his father wants some pastries.

In contrast to these working families, a mother from each of the Greenlawns Hill families is at home when the children return from school. This means that there is continuity in the pattern of child caretaking; the children are neither left alone nor under the care of older children. I believe that this factor, in combination with various environmental qualities of the hill, results in a greater dependency from direct parental care and provision. The children have less opportunity and fewer reasons to challenge the outer limits of their territory.

Some mothers do not work away from home, but have an enormous amount of work to do around the house. This is particularly true of the mothers of large families of children. In such families, children, usually girls, are commonly expected to help out more and be around the house more than in smaller families. This is especially true when the mother has an infant to attend to. One fifth-grade girl responds to the question on free range for herself and on behalf of her fourth-grade brother:

" . . . but most of the time we have to let her know wherever we are now that she has a baby, and so we tell her, and don't go too far--usually out back."

One further factor affecting spatial range which could not be documented other than via a series of anecdotes, concerns different mothers' feelings about themselves. The fear of losing closeness with one's

children leads some mothers to be over-tight in their restrictions. As will be described in the discussion of birth order below, this information was volunteered to me by some mothers who felt they had since matured and transcended this attitude. Mothers who had recently separated or divorced seemed to face this issue in exaggerated form. Not only do they perhaps feel a greater fear of losing their children to the larger social circle of the town but they fear the loss of discipline that might result from being the only parent.

For an encouraging new trend toward more holistic field study in psychology there is a considerable amount of new research under way on the effects of family structure and working patterns on child-rearing practices (Bronfenbrenner, 1975). I am not yet aware of any such "social ecology" studies which have considered the effects of these variables on children's environmental behavior. Such research would be most valuable in enabling us to more confidently identify some of the forces suggested above.

Within-Family Variations in Parental Range Restrictions

Four mothers independently suggested to me during the interview on range that their first-born child was more restricted in range than later siblings. The greater range of the second and subsequent children may be partly related to the increased aspirations which result from the children seeing their older siblings go places. It is probably more influenced, however, by the mother's improved understanding of what she can safely allow her child to do and not do. There was also a voluntary suggestion from two of the parents, and from my informal conversations, that in large families the last child is sometimes more restricted than the middle children. The explanation is that the mother has a greater desire to hang on to her last child and hence overextends her responsibility to keep the child close to her. The same dynamic may perhaps be true with the mothers of "only children." The changes in mother-child attachment as a child grows older are the result of a subtle interactive process. The healthy development of a child depends in part upon the mother's ability to gradually recognize her child's growing competence and to relinquish responsibility accordingly (Appendix A-1: review of "attachment behavior" theory).

The two parents, of course, often have very different ideas on the degree of freedom to be extended to their children, and though it is almost always the mother who administers the rules, the father often has the final word. It is he who hands out the punishment. One woman recently separated from her husband reflected with concern one day after the recent death of a boy in the quarry:

"I seem to have given my girls much more freedom lately. I don't know why. I must be getting older and more lax, but then my husband had some pretty clear ideas on how to control the kids."

Environmental Influences On Spatial Behavior

The Greenlawns Hill environment is ideal for parents who wish to find their children quickly for mealtimes or to prepare for a shopping expedition, etc. A few loud shouts is usually all that is required. Nevertheless, it seems that children are expected to sense when mealtimes are approaching. One day I observed the Johnson children (five and eight years) being scolded for being behind their next-door neighbor's house, and therefore not hearing the first summons to lunch, even though their "free range" extends to all of the houses on this street. The landscape qualities which make the hill convenient in this respect are common to new suburban housing tracts. First, there are the landscape qualities which combine to provide excellent visual access: mild topography, absence of vegetation other than lawns, and low density of buildings. Secondly, there is the relative quiet of the neighborhood which, coupled with the presence of other parents, enables shouting to be an effective means of communication. Thirdly, there is the relatively high proportion of children of similar age. Not only does this mean that any single child need not travel far afield to find playmates, but also that the children can operate when necessary as messengers from impatient parents to children absorbed in play some distance from home. A further advantage of this "suburban" tract, and no doubt also true of others, is that because of the high proportion of families with young children, parents can share the responsibility, implicitly, and occasionally explicitly, of watching over children other than their own. This demands little extra effort because all of the children play close together either as a single flock (as in kickball or cycling races), or, at least, as a swarm with sub-clusters (as in more advanced games when the younger children "hang around" rather than participate).

It was noted at the beginning of this chapter how relatively large are the free ranges of pre-school and kindergarten children living on this hill. This was explained in terms of the greater visibility offered by the landscape and the presence of many other children. This large range seems to be one common positive feature for children living in such suburban landscapes. But I believe, at least in this instance, that the parental caretaking pattern which had been a positive feature for the younger children became a somewhat negative force in the later years. I hypothesize that the continual process of negotiation by children with their parents on the extension of range, which I had observed in other parts of the town, whether it be to get candy and comics or to visit a friend, is reduced on this hill for two major reasons. First of all, in previous years there were many other children to play with; there was little call for the children to desire extensions of their free range. Secondly, none of the mothers living on this hill are at work when their children return home from school. Because of this, they not only watch over, but provide for their children by driving them to places and fetching things for them. This use of the car for children is another feature of this hill which I believe resembles the pattern in most middle class suburban settings. I believe this practice resulted in the absence of two negotiative processes which would otherwise gradually extend the children's range. First, it is common for children to begin their range extension in a certain direction by running errands for their parents. This later becomes approved, especially

if the parents are rarely at home during the day and depend on their children to collect the mail, a newspaper, milk, etc. A second common sequence is for a child to gain approval to visit a friend after school by first being watched across the road, later only needing to ask permission, and finally being allowed to make the visit on his or her own. The completion of this sequence is again much more likely when the mother is at work during the day. (All mothers were home when the children of Greenlawns Hill returned from school.) Each time a child learns to deal competently with more, both child and parent are encouraged to even further extend the child's range of activities. While some children and their parents are respectively learning to negotiate and to accept traffic, physical dangers, and the various social ills of small town main street life, the Greenlawns children are still "contained" in their own neighborhood punctuated with chauffeured visits to specific locations (stores, friends' homes, school sports) by their parents. They therefore miss opportunities to learn by dealing with danger and uncertainty and by making decisions by themselves. So distinctly different are these child-rearing practices and so potentially important are they for children's development, that I believe this question well worth pursuit through comparative study.

Children's Paths, Short-Cuts, and Ritual Routes

Considerable value is placed by the children on knowing how to get to places. Paths are "discovered" by them and the secret shared with their friends with much drama. Special pride is exhibited in the finding of "short-cuts." This knowledge is commonly shown off to friends with that aura of great excitement which surrounds the sharing of any important "secret." When new paths are discovered to link two previously explored routes, children pursue them with excitement, especially if the route enables some alternate route of return. So important are these short-cuts that children will ironically often go out of their way to use them! Access to the river is the most classic example in the town. Although there are easy east and west banks sloping down to the river on the south side of the bridge, many of the children choose to use one of the four hazardous routes portrayed in Sketch Figure 4-10 (for locations see Routes 12 and 13 of Map Figure 4-11). One of these routes requires leaping out from above a concrete wall to the hanging limbs of a tree which then lowers the child not so gently to the river bank (Path No. 12). The other, used only by a few of the boys of fifth and sixth grade and over, involves climbing down the bridge itself to an outlet pipe and then dropping 12 feet or so to the river bank (Path No. 13). This may be a demonstration of bravado, it may be a personal test of physical strength, or coordination, or confidence, but I suggest that it is above all, fun. I learned from some older high school boys that they also had valued paths during sixth and seventh grades, "escape routes" for when they were engaged in daring exploits such as the setting off of firecrackers. Children seem to find as much enjoyment in getting to places as they do in being there. In fact, there often is no "there"; they are just exploring. These are qualities which are very easy for adults to overlook. Most of us usually think of routes in purely functional terms, as a means to ends rather than as the ends in themselves.

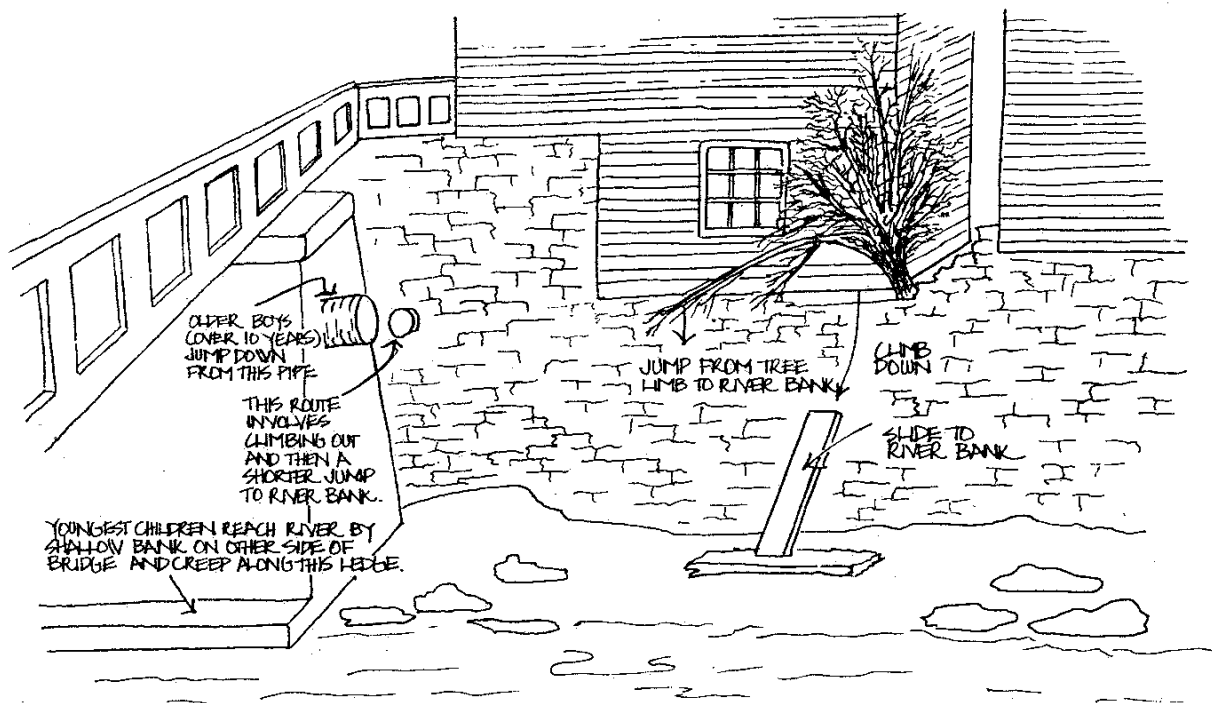
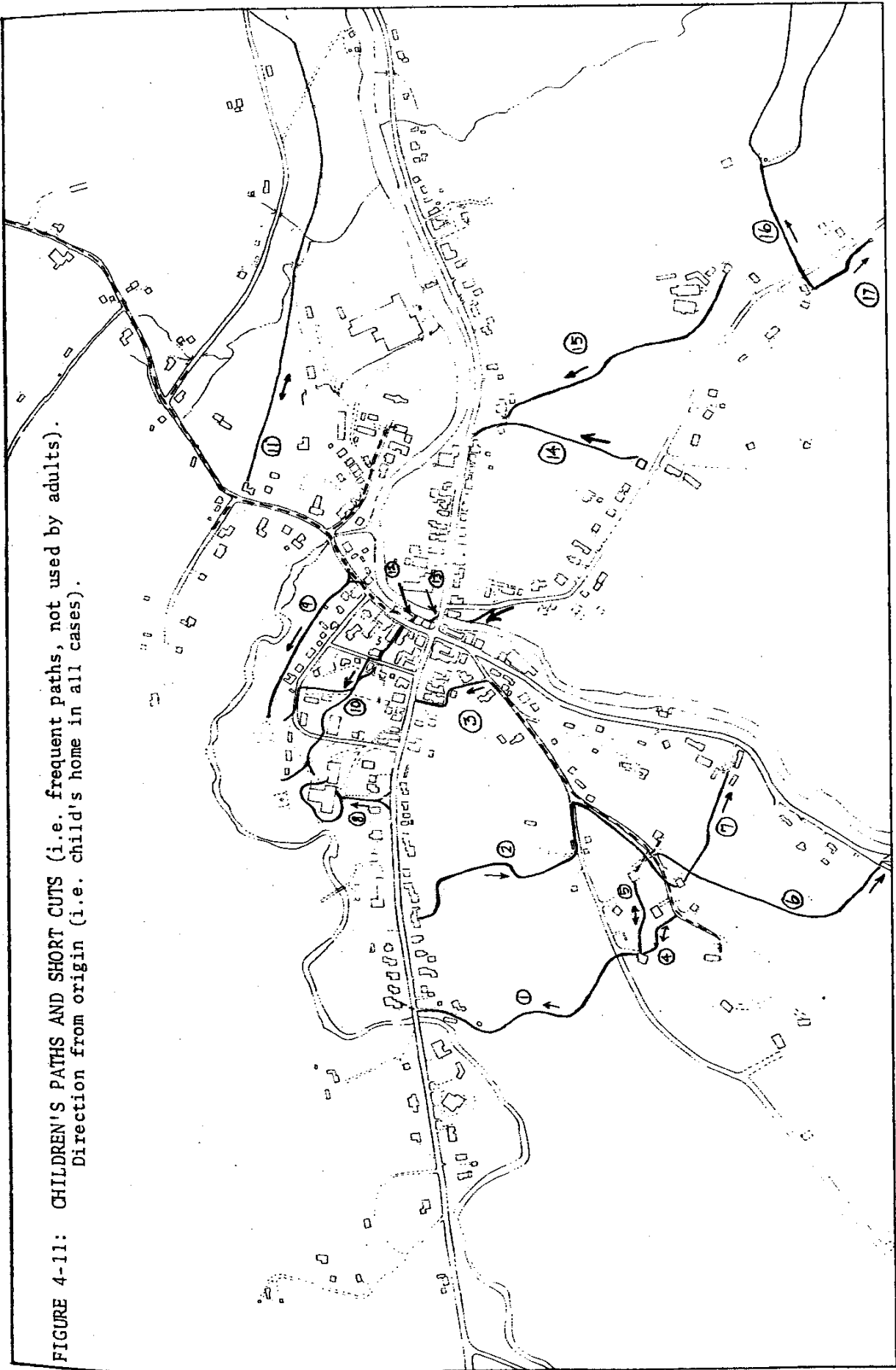


FIGURE 4-10: SHORT-CUTS TO THE RIVER.

FIGURE 4-11: CHILDREN'S PATHS AND SHORT CUTS (i.e. frequent paths, not used by adults).
Direction from origin (i.e. child's home in all cases).



Map Figure 4-11 describes those routes frequently used by children which no adults use at all. It is notable that some of the children of both Plum Hill and Greenlawns Hill found in the use of paths a way of overcoming their restricted "ranges with permission" by by-passing their parents' fears of road traffic. By walking down to Main Street East and Main Street West via the fields, they can play with children living on the north side of Main Street (Path Nos. 1, 2, 14 and 15) or, in the case of one seven-year-old girl, be escorted across the road by a waiting parent who has been pre-warned of the trip via telephone (Path No. 1). One of these short-cuts, taken by a number of the Greenlawns Hill children, involves passing through the backyard and driveway of two homes, a liberty which would be inconceivable for an Inavale adult (Path No. 3). A similar path, which travels partly through a back garden and underneath a hedge, was used every school morning by all nine West Main Street children to get to their school bus pick-up point at the High School (Path No. 8). Another route very frequently used by the two children of Field Lane involves climbing over the walls and crossing the cemetery to reach the High School (Path No. 10). No adults would consider such a route; they would automatically take the circuitous road and sidewalk route to the High School.

The Plum Hill family of children, which is most isolated and prevented from visiting friends "downstreet," found a solution by climbing over the reservoir hill and meeting their friends from "The Development" half-way (Path No. 16). Like the two other girls who travel from Plum Hill down to Main Street (Path No. 14), they telephone first to make arrangements with the children and their parents.

Some children appear much more willing than others to explore alternative routes. How much this is a long-term behavioral difference and how much it is part of a larger "stylistic" difference in that child's manner of relating to the world, could not be determined in this investigation. I did get the impression, however, that this may be, at least in part, a developmental phenomenon. When a child does not know an environment well, he or she may be more likely to deal with the complexity by sticking to a fixed route. In the case of extreme complexity, this route may become so important that it takes on an almost ritual significance. The clearest suggestion of this came to me from Enid, aged five. By walking from her home on the north side of West Main Street, she had learned that after crossing the busy road under her mother's eye, she walked along the sidewalk past the gas station and the post office and the bank before turning down School Street to the bus yard by the High School. When her older friends began taking the short-cut through the bushes behind the post office, she refused to join them. I initially thought that her mother might have given her very specific instructions to go a certain route, but in fact, her mother had told her to go with the other children. Enid insisted that hers was "the" way to go to the High School, and she confidently stuck with it. As will be seen in the following chapter, this reflects the linear representations of the spatial world which children of kindergarten age commonly hold.

The Acquisition and Use of Vehicles

Although I noted a high degree of commonality among the families with respect to acquisition of the various types of child transport, no systematic data can be offered as only the parents of the sub-sample were formally interviewed. The following shows the most common age at which children acquire the various means of transport; it does not apply to all children.

Foot propelled vehicles (no pedals) e.g., trains, ponies, etc.	-	1½ to 2 years
Scoters	-	2 to 3 years
Tricycles	-	3 years
Bicycles with training wheels	-	4 years
Bicycles	-	6 to 8 years
Skimobiles	-	10 to 11 years
Mini-bikes	-	11 years

Only a few obtained mini-bikes or skimobiles and a few of the poorer families had to delay buying even a bicycle. It is notable, however, that while a number of girls older than nine years of age had no bicycles, all the boys of these ages had a bicycle of some kind.

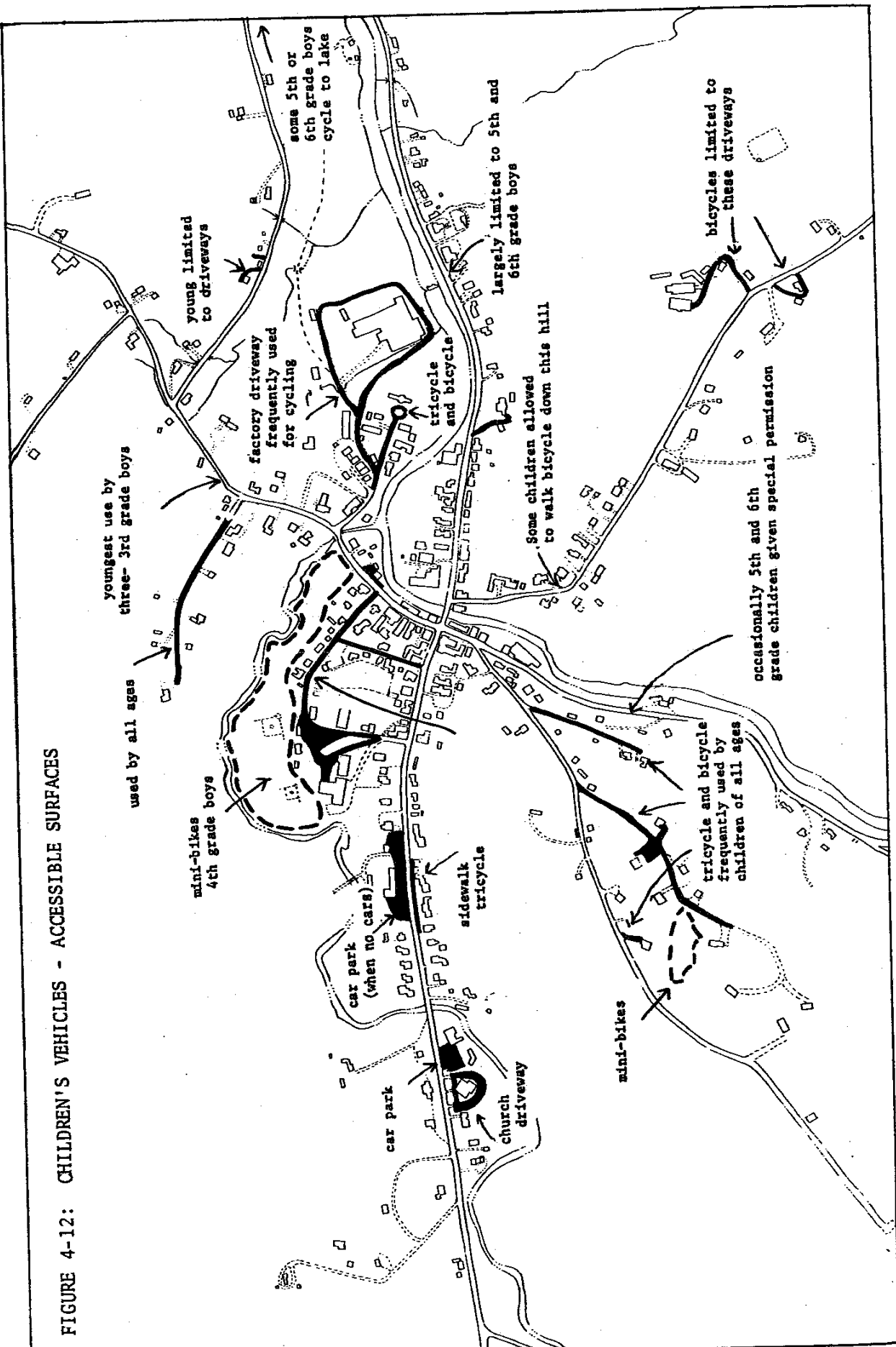
Data regarding the availability of suitable surfaces and the allowed ranges of using vehicles came from the range interviews with the children. This data, together with observations from my logs, is summarized in Map Figure 4-12. Specific data on vehicle use is compared for two age groups only (grades K through one, and grade three) in Map Figures 4-13 and 4-14.

1. Foot propelled vehicles (no pedals)

A number of children ride or had ridden some kind of four-wheeled vehicle such as a train or pony which they acquired around their second birthday. These vehicles do not provide any geared system to increase the children's locomotion, but they are quite adequate for the area around the house and driveway of this age group. They probably provide a training opportunity in physical coordination for graduation to a trike. Children demonstrate an early awareness of variations in landscape surfaces and their suitability for wheeled vehicles: one mother described with pride how her two-year-old learned to use the garage ramp in order to give himself a good ride on his four-wheeled pony.

Less common at this age are scooters. As with the trikes, there is a real shortage of suitable paved spaces for the drivers of these vehicles. Their use is limited almost entirely to the driveways and sidewalks of the town, though I understood that the young children of Greenlawns Hill Road had been able to use them on their quiet, though bumpy, dirt road (Map Figure 4-12).

FIGURE 4-12: CHILDREN'S VEHICLES - ACCESSIBLE SURFACES



2. Tricycles

Almost universally, the children obtain some kind of three-wheeled vehicle, usually at a point between their second and third birthdays. Most commonly this vehicle is inherited from an older sibling, or neighbor, and the child begins to ride it just as soon as she or he is able to reach the pedals. These three-wheelers are also largely limited to use in the driveways and sidewalks (Map Figure 4-12). Still, they develop in importance such that many four and five-year olds do all of their travelling to and from neighbors' homes on them. This depends of course on the degree of freedom from adult motorized traffic. Greenlawns Hill Road is again ideal in this respect (Map Figure 4-13). Similarly, the upper end of Factory Lane receives so little traffic that the boy living there has considerable freedom. The remaining children younger than second grade are limited in their tricycle use to narrow strips of sidewalk stretching alongside the busy roads (Map Figure 4-13).

3. Bicycles

Most children do not learn to ride a bicycle until about six or seven years of age, although a few children start at four years with a bicycle with training wheels. By the beginning of second grade (seven years), one or two children begin to ride bicycles in their driveways. They search out and use all of the paved areas free of traffic, and cycle for such long periods that one would think them mesmerized (Map Figure 4-14). Most, but not all, of the roads in the town are paved. That road which was most accessible for cycling, Greenlawns Hill Road, was not paved. The children are most aware of this limitation. In response to a completely unrelated question posed in the fall about whether she takes her children to other children's homes, one of the mothers living on this hill exclaimed that she did not need to:

"We black-topped our driveway and all of the neighborhood uses it. We came back from our vacation in mid-June and five children were riding on it! They still are, first thing every morning."

Similarly, when the town built a tennis court next to the school ball field in the fall, there was a week before the fence was erected when the few 100 square feet of tarmac was occupied by a milling squadron of children on bicycles.

By the beginning of the third grade, the pattern was markedly different. The six third-grade boys of North Hill were allowed to cycle to each others' homes, the ball field, and in three cases, to the center of town. As evidence that the parents still worry about the steepness of this hill, one of the three boys may cycle up, but not down the steep stretch above the river. One of the boys said he is even allowed to cycle all the way to the ice-cream stand if he is with his 12 year-old neighbors. Why his mother should feel safety in accompaniment with others on a cycle is not clear. The boy living on Snowdon Road is similarly able to cycle to the center of town when on an errand for his father,

FIGURE 4-13: TRICYCLE USE - GRADE K AND GRADE 1, SUMMER 1

- Boys' home
- Girls' home
- Area tricycle may be used

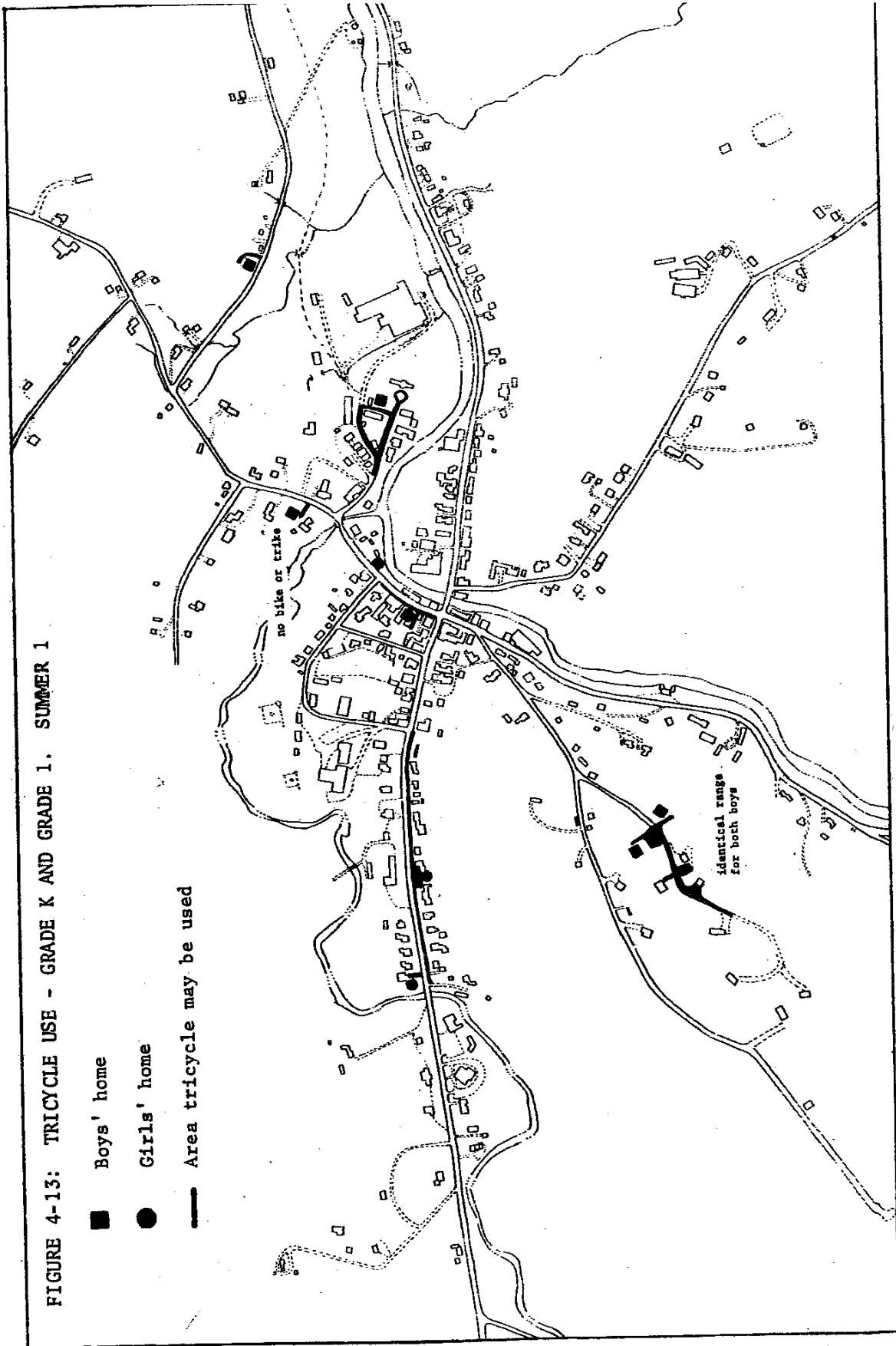
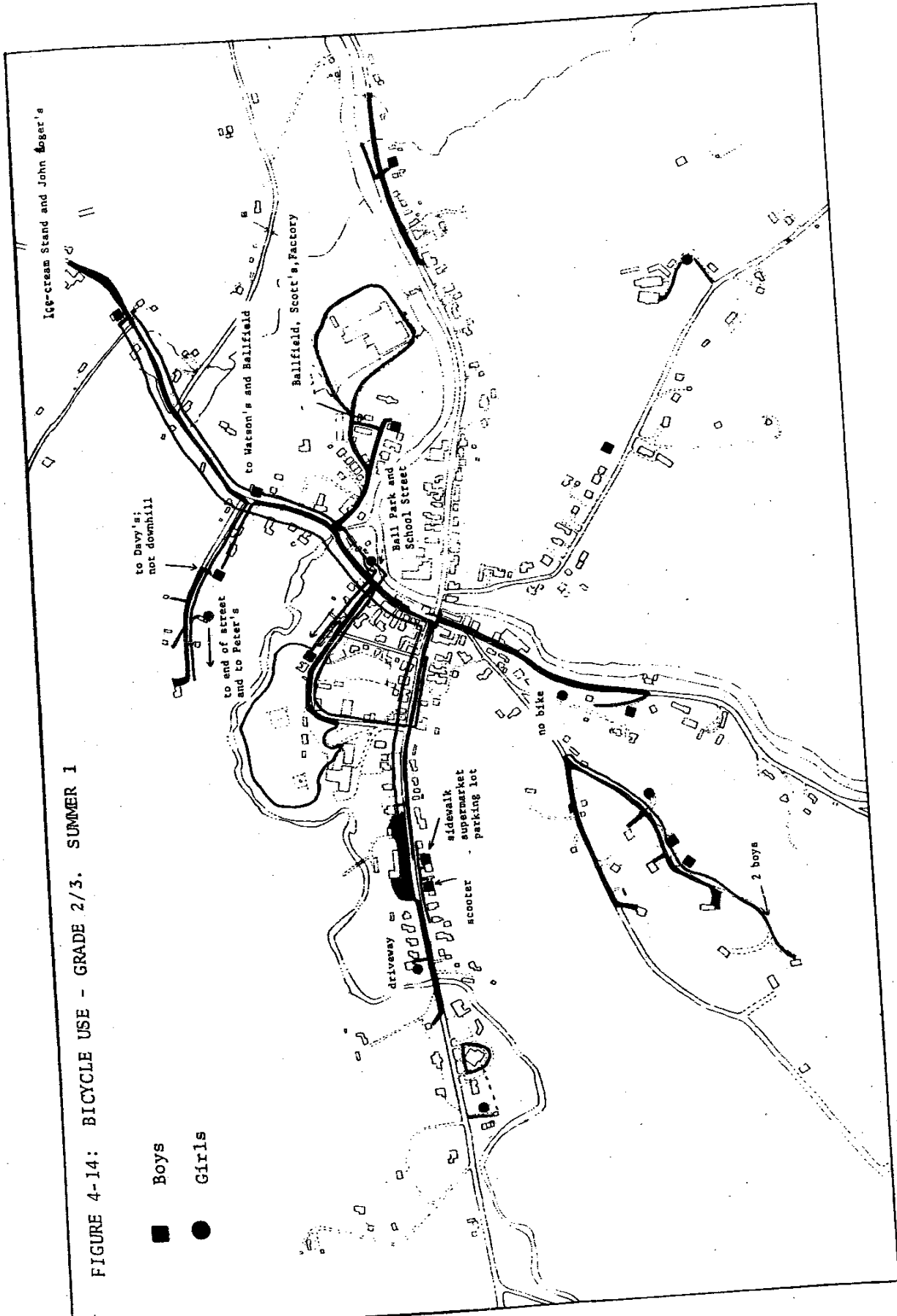


FIGURE 4-14: BICYCLE USE - GRADE 2/3. SUMMER 1

■ Boys
● Girls



and the boy living on Grandville Road is now able to cycle along this very busy stretch of highway. In contrast, the children living on the extremely hazardous stretch of road across from the busy Universal Supermarket parking lot must be satisfied with the sidewalk and the evening and Sunday use of the parking lot. The two third-grade boys of Greenlawns Hill Lane are restricted from cycling below the junction of their dirt road with Pleasant Street. Understandably, the parents consider the grade far too dangerous for the children to control their machines. But fortunately, their lane is sufficiently long and flat to enable them to use their bicycles to a greater extent and in more diverse ways than can be allowed elsewhere in the town. Road races, jumps and "wheelys" are all regular stunts played out on the valuable machines which these children obtain just as soon as they begin to ask for them. Meanwhile, none of the six girls in the third grade are allowed to cross a main road, and the most liberal extension is for a girl living at the bottom of North Hill Road to take her bicycle across to School Street in order to cycle to the ball field. The remainder are limited to side streets, driveways and parking lots, like the boys one year their junior.

During the fourth grade (nine years), the pattern is similar. One girl living on Plum Hill is able to ride up the hill but not down it, again because the parents are convinced that their child could not control the machine on the steep grade. So keen is this girl to ride that she cycles up and down a field, to and from the reservoir! The two fourth-grade girls living on Main Street still may not use their bicycles on this busy highway. One of the two girls on North Hill Road may go to Main Street but she has to restrict herself to cycling on the sidewalk. Perhaps the fact that she has two slightly older brothers has something to do with this greater liberality.

By the beginning of the fifth grade (10 years), seven of the eight boys are free to cycle anywhere in town except the treacherous Snowdon Road. This road has been defined by the traffic department as the busiest in the state in terms of volume for its narrow width, so the parents' restrictions are well justified. The parents of the eighth boy, who lives on Greenlawns Hill, feel that the grade of this hill is too steep to allow cycling, even though he is 10 years old. The children themselves understand this fear well. One of the North Hill boys explains with understanding that he may no longer cycle down North Hill Road until he has a new bicycle with good brakes. The boys know well that they should report back by a certain time because their mothers worry about the bicycles. Of the six girls of this grade level, two have no bike, one is limited to driveways, one to her local street (School Street), and only two are allowed to ride at all on Main Street. One of the two girls without a bike, who lives on Plum Hill, volunteered the explanation that her mother does not want her to cycle at all on this dangerous hill.

By sixth grade (11 years) and seventh grade (12 years), the five children of Plum Hill and Greenlawns Hill of this age, may not cycle on their steep gradients. In contrast, by a gradual process of learning to deal with dangers, the four remaining children in town with bicycles may use Main Street on all but the busiest of times such as

Memorial Day. Snowdon Road, which leads to the elementary school, may be used by a small number of sixth-grade boys (no girls ever observed) in order to reach the school for special events. The dependence on parents for transport to such events remains one of the most frustrating factors for a school committed to an "open" philosophy of use.

Occasional comments revealed to me that parents are themselves aware of the gradual relaxation of their range rules as their faith in their children's competence grows. The mother of two children on Main Street (aged nine and 10 years) explained during my interview:

"They can use other kids' bikes on the sidewalk and the Universal Supermarket parking lot, but if they had their own bikes, it would probably be further that they could go."

In summary, this account confirms the suggestions from studies in other countries that parents' fears of traffic are a major factor in the limiting of range. It also demonstrates that parents are aware of the kinds of limited competence children under 10 years of age have in handling bicycles in traffic, as described in research reports of the Swedish Government (Skandia, 1971, 1974). An explicit statement of one of these factors came from a fifth-grade girl living at the bottom of Plum Hill. She explained that although her father gave her a cycling test to the High School, her mother probably would not let her go to a girlfriend's house because "I'm too small and people might not see me and hit me with their car."

4. Mini-bikes

Two or three of the town boys of each grade level obtain a mini-bike by the time they reach the sixth grade. During my stay in the town two fifth-grade boys and two fourth-grade boys were given mini-bikes; three of these children are residents of Greenlawns Hill. Not only can these families afford such purchases more readily than many others, but, as noted before, their environment enables readily safe use of mini-bikes without the parents having to drive the boys out to some field each time. Four other children on North Hill Road are able to use them in the fields on that hill, or if they prefer to show off their skills to each other and to their peers, six of them are allowed by their parents to ride their machines around the ball field. Unlike the bicycles, these mini-bikes don't lead at all to any extension of the children's ranges; their parents limit the use of the machines to well within their already established spatial range. I noted considerable negativism towards these rather noisy machines. Some of the parents of other children voluntarily express the feeling that children are being over-indulged, and that this leads to impossible demands by their own children. Certainly social pressure from child to child, and child to adult is very strong, an observation supported by the tight proximity of those families whose children have mini-bikes. One mother expressed to me, on more than one occasion, her anger at this "rat race" pressure on her children and her annoyance that the father had submitted. My own observations are negative in that (1) these machines are very rarely

used; (2) when they are used, it seems it is almost always as a status symbol; and (3) the boys learn nothing about their maintenance and repair.

5. Skimobiles

Only one or two boys have their own skimobiles, but most of them are allowed to drive at least one of the family machines by the time they have reached the fifth grade. This opportunity is very rarely extended to girls. The boys are not, of course, allowed by law to cross any of the town roads, and the police try to enforce this. The parents, however, often allow their children to cross the minor roads in town to specific fields without steep or rugged terrain. Some boys will drive these machines for over an hour at a time, but, from the stories I so often heard, much greater value is placed upon the expeditions away from home territory with the father. These expeditions often lead father and son into wooded or rough terrain well beyond the boy's own spatial range. Children commonly refer back to these trips when excitedly describing to me, in the spring or summer, some deserted house, bear cave, or sugar cabin, etc., lying beyond the edge of their personal spatial range. These trips provide a rare and highly valued opportunity for the boys to spend time alone with their fathers, an opportunity which comes in only a few ways--fishing, hunting and occasionally some kinds of work around the house, such as gardening.

Social Geography

No specific procedure was devised to investigate the patterns of children's social interaction in Inavale. This is partly because I felt at the time I wished to de-emphasize this much-studied aspect of child development. I also felt that a number of procedures designed primarily for other parts of this investigation would provide relevant information. I have since concluded however that while children's social interaction has been given much attention by psychologists, very little is known about this question in settings other than homes and classrooms, and that it is a very important aspect of children's use of the outdoor environment. In addition to the obviously important issue of children's opportunities to develop relationships with others, there is a question more related to the focused concern of this investigation: how do children's activities vary according to the presence or absence of other children and according to the age and sex of the other children? This is again a spatial, or accessibility, question. It has particularly important ramifications for children with no siblings, children living in sparsely populated areas, and for urban children living in environments where access to the outdoors is extremely limited. It has not to my knowledge been the subject of any comparative study.

Fortunately, I was able to extract useful data from the landscape models and place preference interviews, methods which are described in detail in the two subsequent chapters. According to the diary data, approximately 25 percent of the trips made are to the homes of other children or adults (Table 4-5). Interestingly, a larger percentage of

the girls' trips (27 percent) are of this nature than of the boys' (22 percent). This disparity is considerably greater with the younger children where 33 percent of the activities reported by girls are visits to homes, while only 23 percent of the boys' trips are of this kind.

Similar to the diary data, a larger proportion of the elements represented by girls in the landscape models are homes than are those represented by boys. Perhaps people's homes are more important in the lives of girls than in boys' because of the girls' more restricted opportunities to engage with the environment unaccompanied; approval comes more readily to go to other people's homes than it does to go out alone to see "what is happening."

One of the most important differences in the social geography of girls and boys is the considerable child-caretaking responsibility given to girls; boys are rarely given this responsibility. It is this which explains why nine of the diary entries for girls are "directed" social activities compared to only one such entry by the boys (Table 4-7). In families with more than one child, child care seems to begin in a small way almost as soon as a mother can explain to her daughter that she should keep an eye on her baby or infant brother or sister. By the time a girl is 10 years of age, she may be left for up to a day at a time with younger brothers or sisters during vacation-time. At this age girls are also often asked to babysit for other families. This is especially true in Inavale where, at weekends and during vacations, many young married couples depend upon town girls to care for their children. It is perhaps this activity which explains the greater willingness I observed on the part of girls to play with girls and boys younger than themselves.

Not surprisingly, the percentage of adults' houses mapped in the landscape models grows with age. I believe this is simply a reflection of the greater accumulation of information with age; only a small number of adults in the town are important to the children of any age.

A number of elderly persons are highly valued by the children of Inavale. A child usually has one or two such friends at most. So valued are these persons, that some of them are visited or chatted with by all of the children living in their section of town. Detailed examples of this kind of interaction are provided in the family studies (Chapters VIII and IX). From what I could observe, the central dynamic behind these relationships is that both the elderly and the children freely give time to listen to each other. True, there is something of the wise old sage fascination for children and for the old persons, the joy of being able to observe and talk with relatively uninhibited, highly active children, but the prime quality, I think, is their voluntary joy in being together.

Seasonal Patterns of Social Interaction

The patterns of children's social interaction change markedly over the year. Because of this, the aggregate data reported above would be different in a number of ways had it been collected during the wintertime. The decision to collect one class of data at a time in order to shorten

the period of collection and thereby minimize seasonal effects was a good one. Any future comparative attempts with this investigation must take into account the time of the year the data was collected.

During the winter the number of child-initiated meetings are much reduced. First of all, as the land-use survey reveals, there are considerably fewer children out of doors at any one time during the winter than in the summer. Consequently, the opportunities for "chance" meetings is much reduced. Secondly, and also because of the cold, the children have less time to just meander about to "see what's happening," or even to walk more than a few 100 yards to meet friends; outdoor play occurs in short bursts interrupted by frequent trips indoors to warm up, play games, or watch television. Finally, in the wintertime, there are no "organized games" played in the town that demand more than two persons. Tobogganing in its various forms seems to be considered more fun if played by three or four children, but works equally well with one child alone. The skiing and skating places are a few miles outside of town. Consequently, children of the poorer families are denied this opportunity except when taken by the Elementary School. In addition, there is something of a "rat race" in the annual purchase of the latest skiing equipment and clothes which also deters the poorer families or those parents who are opposed in principle to such lavish expenditures on a sport. Most of the "native" families of the town fall under this category. There is then a more marked segregation of the poorer children from the richer and the "native" from the "immigrants" (two overlapping but not identical categories of family) during the winter months, than is the case during the remainder of the year. In the other seasons, the ball field, the streets, rivers, and lakes are equally accessible to all of the families independent of income. The richer families do equip their children more with bats, balls, gloves and snorkels, etc., but this does not seem to make any significant difference.

There are also some marked changes in patterns of social interaction related to the school year. When school recommences in the September of each year, children who have not seen each other for over two months come into contact again and new friendships are made and old ones renewed. Plans are busily made to meet after school and to stay overnight. Most of my observations of children breaking the rules about returning home quickly were entered in my log during September of each year. But the children are now in an older grade and have spent a summer negotiating with their mothers larger and larger spatial ranges. Consequently, the parents (usually the mother) are often ready to grant new freedoms for their children to travel to their friends' homes. Had the diaries been completed in the fall, they would have shown a very large number of movements back and forth across the town.

Family Differences in Social Interaction

In his book *Privacy*, Simmel distinguishes two different kinds of family systems: the "closed," and the "open" (Simmel, 1971 from Summary in Wolfe and Lauffer, 1974). The closed family typically, he claims, found in the city, develops its own rooms, controls its own children

and does not allow others to do so. To maintain their differences, such families find ways of isolating themselves. One physical manifestation of this is that children are not allowed in each others' homes. At the same time the parents of such families allow fewer opportunities for personal and psychological privacy within the family structure and demand more conformity to family norms. In polar contrast, the "open family," which is said to be generally found in more homogeneous settings such as small towns, parents are not concerned about their children being subject to varying influences. The families are similar to each other and do not attempt to construct boundaries or otherwise isolate themselves. Parents in such communities feel free to supervise each others' children.

Simmel's distinction between these different kinds of family systems and of some of the dynamics behind them are most consonant with many of my observations concerning children's spatial behavior and parental control. Greenlawns Hill is clearly a hill of open families; the landscape of open green lawns devoid of boundary markers, is itself an expression of this. With the exception of one family at the very top of the hill, which has set itself apart both spatially and socially, these children are free to invite each other into their kitchens and all parents share in an informal manner the role of caretaker and arbitrator to any of the children who may be around. In marked contrast are a number of the town's native or older families, such as those on Plum Hill, who consciously wish to separate themselves from what they perceive as the negative influences from the newcomers, whom they perceive to be growing in number in the town. One such Plum Hill family is described in detail in Chapter IX.

Granting permission for children to make overnight stays is something which is carefully weighed by mothers. Approvals tend to be made within income or class boundaries and between parents with similar child-rearing attitudes. Again, these two categories of parent overlap to quite an extent; the "native" families often regard the "immigrant" families as too liberal with their children. The reason for such care in making the decision about overnight stays is that mothers are expected to reciprocate the offer. This is also true when children from other families come to play during the day around any one mother. If this happens repeatedly, and a child's mother does not offer to reciprocate or otherwise appease the "host mother," it commonly results in the host mother's child being told to discourage the other child by not playing with her or him anymore.

Best Friends

Questions about best friends were not asked systematically of all the sub-sample of children because of my realization that this would endanger my relationship of trust with them. The children would have quickly learned that questions about best friends were being put to other children including their friends. This, I anticipated, would have put them into a more guarded frame of mind when talking with me. However, when opportunities arose in general conversation during the place expeditions and in the place preference

interviews, I did casually ask the children who their favorite friends were.

Not surprisingly, a high proportion of children selected favorite friends from children in the same school class, and of the same sex. There was also a tendency to select children older than themselves. More interesting to the focus of this study however are the spatial aspects of these "sociometrics", a subject which to my knowledge has not been studied in children by geographers, sociologists or psychologists. The immediate child neighbors were included in their lists, unless they were younger children, in which case they were commonly referred to quite abusively! In the selection of other children there seemed to be a difference between boys and girls. Whereas boys selected male friends from various places in the village within their visiting ranges, the girls commonly identified their girl friends as living in homes lying well beyond their "with permission" ranges. They are taken to these homes by their mothers in cars, something which seems to happen very rarely with boys of eight years and over. To what extent the mothers' choices of each other as friends follows the friendship preferences of their daughters and vice versa would be largely guesswork on my part, but it is true that most of these out-of-range girl friends are classmates. I learned in a number of cases that the families had developed their relationships around mutual child-care and child-trip services and this may have been true of many of the families.

Children's spatial behavior has been shown to be influenced by a complex set of dynamic forces lying within the physical environment, within the rules of parents and others, and within a child's own mind. Future research will hopefully be able to recognize these complex forces in learning how to liberate children in those settings where their freedom of movement and accessibility to resources is seriously constrained, in comparison to that of the children of Inavale.

CHAPTER V. Place Knowledge

Procedures

"Where the President lives is over the sandbank, in Washington. You know, the sandbank across the street from us (his home), and so that's the United States." (Johnny, 8:1)

The construction of young children's place knowledge is limited in large part to the environment which they have experienced directly. This is particularly true of their knowledge of the location of places. This much I could anticipate from the research of Piaget and from those investigators who had looked specifically at children's knowledge of the large-scale environment (reviewed in Hart and Moore, 1971 and Appendix A-2). I had already learned from research on classroom geographic education with third-grade children that the learning of distant places in school and presumably from television books, comics and other persons, was not integrated by these children into the knowledge they had gained from their personal engagement with the environment (Hart, 1971). I soon learned from the children of this study that almost all of their discussions and questions are concerned with places in their home environs, within the horizon of their known world. While they may occasionally muse about distant places, they do not seem to work at understanding where these places are relative to their own home environment. This is not surprising, following Piaget's formulations: distant places lie outside of a young child's directly experienced environment and hence cannot be readily assimilated into their known world (Lee, 1963; Hart and Moore, 1971). The emphasis of such young children's interest is upon the environment which they can, through their direct transactions with it, differentiate into places and incorporate into their expanding system of representation (1). For these reasons, the emphasis of this chapter is upon the development of children's place knowledge in and around Inavale. Information about their knowledge of distant places comes best from informal discussions such as the one which resulted in Johnny's statement above. Most of my insights concerning children's knowledge of distant places, therefore, came from talking

1 The term "spatial representation" is used throughout this chapter in preference to terms used by others, such as "map" or "schema" in order to avoid any tendency on the reader's part to think of children's place knowledge as a static mental image. The definition offered by the French Canadian developmental psychologists, Laurendau and Pinard (1970, 13-14) is satisfactory: "spatial representation" is an implicit action which is carried out in thought on the symbolized object." Such internal, or mental, representations must be distinguished from external representations of the spatial environment such as children's drawings or model landscapes. External representations are of interest in this chapter only in as much as they shed light, through inference upon the development of a child's ability to mentally represent the spatial relationships of places in the large-scale environment.



PLATE V

"The micro-modelling of places and events is important in enabling children to better understand places and physical events and how they work . . . Such play offers the opportunity to reduce in scale environments too large to be experienced by children directly."

with the children with whom I spent most time, the sub-sample, and hence are described under the "Family Studies" (Chapters VIII and IX).

In accord with the distinction between recognition and representation of places, this section has two categories of methods. The first, designed to elicit children's ability to represent the spatial relations of place in the landscape, builds upon previous experimentation carried out with others (reported in Blaut and Stea, 1969, 1971; Mark, 1972). The second, concerned with children's recognition and naming of places, necessarily utilizes new and untried techniques.

I chose to analyze the place recognition and naming data for the sub-sample of children only, as time prevented me from doing the complex analysis for the entire population. Discussion of these aspects of place knowledge is, therefore, limited to a brief summary in this chapter. This is supplemented by individual accounts in the "Family Studies."

Place Representation

Purpose:

To discover each child's ability to represent the spatial relations of the large-scale environment beyond their homes.

Data Collection:

The method designed for this study is similar to the general approach used by Piaget in exploring the specific development of children's fundamental conceptions of space and is similar, in the materials used, to one of his experiments (Piaget et al., 1960, 3-26). A critical summary of this and other previously used techniques for studying "cognitive maps," or "topographical representations," illustrates why the more complicated use of models was chosen over drawing (Mark, 1972). Drawings or sketches were unacceptable not only because of the very great variation in motoric and graphic ability with age, but because the pencil or pen brings a degree of commitment to each element drawn which is unsuited to the creative act of constructing a map. One only has to observe oneself or others while drawing a map to realize that this activity is not simply a matter of directly copying some static image in the brain. Such complete images must be actively constructed in thought. Two other available techniques for this research, verbal descriptions of the landscape and way-finding techniques, were both rejected because of their dependence upon linguistic skills which vary considerably in children between the ages of four and 11 years.

In an experiment designed specifically to investigate the reference systems used by children to facilitate their representation of changes of their position in the larger environment, Piaget used model elements (ribbon rivers, wooden houses, etc.) in a sand-box and asked them to map their home area (Piaget, et al., 1960, 3-26). This is very similar to the method finally adopted in this research but with one very important difference: my interest was not to determine the level of children's intellectual development with regard to

space in general, but was specifically to discover (1) how they represented the spatial arrangement of places in their everyday home environment, and (2) what places they knew of. It was therefore important that there be more standardization in the interviewer's questions to the child than there is in the clinical method. If the children had chosen to focus their attention on only those places in their backyard, or on the way to school, for instance, I would not have as clear a picture as possible of the extent of children's knowledge of places and the relationship of these places to one another. I was not able to pursue in depth the level of logical operations children were bringing to the task, but this was not the primary interest of my research endeavor (1). A second difference was that rather than have the children build their places in a sand-box, the children laid out their places on very large sheets of paper. This enabled me to maintain an accurate record of the location of each place by tracing around the models a child used, and to write alongside them the name of the places as given to me by the child.

The research procedure details and materials were developed through pre-testing with three first-grade and three fifth-grade children who were not in the population of this study because they resided beyond the town limits. The children enjoyed the experience very much, but in spite of my attempts to provide a large variety of model landscape elements, they insisted that more of certain kinds be provided: trees, cars, and trucks, in particular. Because I anticipated that each child would have some unique needs, I decided to provide as diverse a set of elements as possible and encouraged each child to speak out if she or he needed anything else or any more of the original set of materials (I maintained a box with double the quantity of materials). In addition to model elements, the children had clay and crayons, and frequently used those to supplement their model/maps with details.

The procedure I finally adopted was the same for all children. Beginning with the Kindergarten, and working up through the fourth grade, I would first spend a day following the interests of the class and thereby meeting the children. I then informed the class as a group that if they were interested, they could each come to my room and build a model with me. They understood that this was a voluntary exercise. The particular method of "taking turns" commonly employed in each classroom was adopted, and each interested child accompanied me to my room.

The children were encouraged to come to the room in their own time, for I needed their full attention on the landscape modeling and did not want them to feel forced into the situation. There were only one or two postponements. One very shy girl in the first grade was clearly not keen and her participation in the exercise was not pursued. On entering my room each child went straight to the set of landscape models and toys laid out on a low bench and was asked, "What could you build with these?" The purpose of this question was to discover whether the models and toys were as suitable for the task in each

1 C.f. Moore (1973a). In his experimental investigation of high-school children's spatial representations of the city of Worcester, Massachusetts, Moore designed additional exercises to specifically demonstrate the subjects' abilities to make logical associations and reverse their thinking on the maps they had drawn.

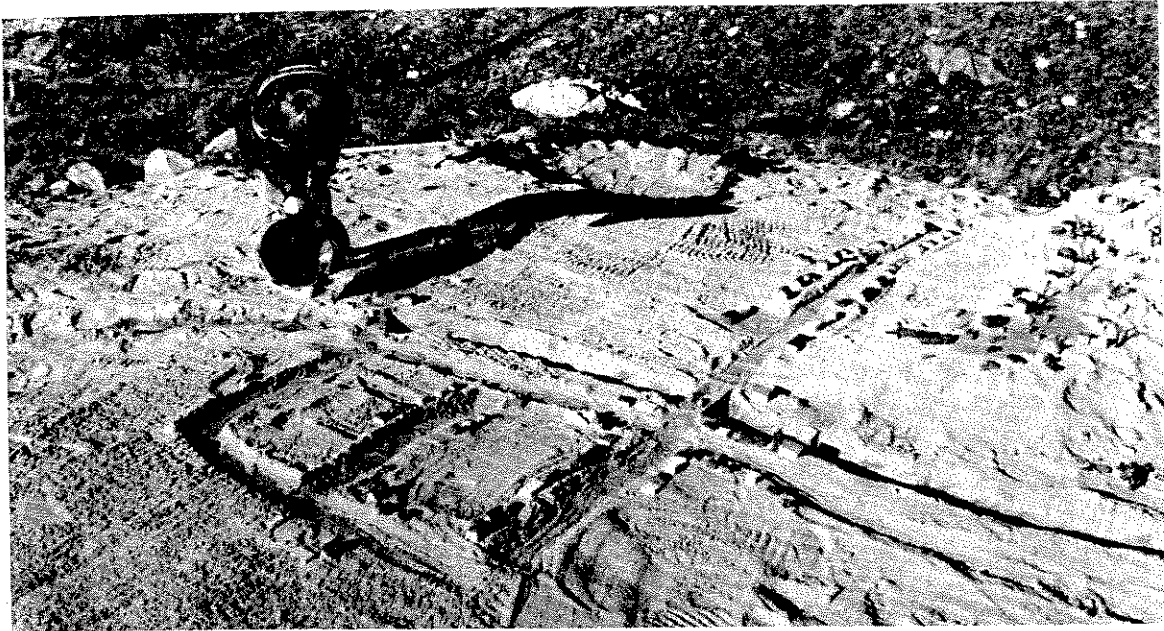


PLATE VI

"Particular care was taken to design techniques which the children themselves could benefit from and enjoy." Modelling in sand (top) is a wonderful technique for investigating place knowledge and feelings. The more constrained method of modelling on paper (bottom) was chosen because it allowed a map record to be made of the mold.

child's mind as they were in my own. I then asked the child to help me roll out two large pieces of paper to make a square (8' x 8') that we could use to build on with the models and toys. It was extremely valuable to have each child share in this task with me. First, it helped the development of the child's confidence with me. Second, it removed the authoritarian restrictedness of an experimental situation; it enabled them to realize that later it would be no problem for them to add further pieces of paper. By the time the children had cut the paper off the roll and stuck it down on the floor, they were ready to respond eagerly to the following instructions:

Choose something that we can pretend is your house and put it on the paper. Now, put on the paper all of the places that you know, including this school. Show me where as many places are as you can. This will help us to build a giant model of Inavale later to show other children what Inavale looks like and how to get to places.

If you don't have the right kind of toys to show me these places, you can also use crayons to draw on the paper, or modeling clay to build places with. If you need any more things or anything else, tell me and I will get them for you. Each time you put something on the paper, tell me what it is and I will write it down so that we won't forget what to call it.

These instructions were repeated in part if the child reported or demonstrated any confusion over them, but usually they set about the task with great earnestness.

When the child moved away from building around the house to some other part of the landscape, he or she was lightly reminded not to forget to put the Elementary School on the paper. The Elementary School had been included in the instructions in order to introduce some communality of scale between the children's model landscapes. It was the only feature situated a considerable distance from the town center (two miles) which I could be sure all of the children were familiar with. By mentioning the Elementary School early in the development of each child's landscape model, I was reminding them to think of the whole project that lay before them. If they expressed concern at this, or at any other time, I suggested they could either change the place of their model elements, or we could put more paper down on the floor.

When the child expressed or demonstrated a desire to discontinue work on the model landscape, he or she was asked:

Have you shown me all the places you know, for as far away from your house as you know? If you want to take a break for a little while and come back, you may.

Pre-testing revealed that it was not a good idea to have a child continue his or her map on the following day. They would forget some of the elements and find the project confusing. Therefore, in order to maximise the chance

of completing the model, I would not begin to work with any child after 1 PM each day. If a child failed to complete the model on the same school day, I arranged with the child and the child's parent to continue the project after school.

When children said they had completed the model they were asked:

1. Do you need anything else to add to the model that you don't have now?
2. Would you make any changes to your model if you had the chance to do it again?

Once assured of the child's satisfaction with the model, an imaginary driving tour of the landscape was taken by the child and myself in one of the model cars (1) to ascertain if the child's previous naming of places had been arbitrary, and (2) because it was difficult for me to recall which names applied to which model elements in all cases. The child was told:

Let us go for a slow drive around all of the places you have drawn so that you can tell me the names of as many of the places as you can. I will draw around the models and name them so that we will know which places to put on the giant model when we build it.

After the tracing was completed, any problems I had in understanding the child's mapping procedures were pursued. Together we removed all of the models and toys, and the child was congratulated on having made a map, usually to his or her great surprise and satisfaction, for this was the first time the word "map" had been used.

Throughout the modelling procedure, I sat on a chair in the corner of the room, encouraging the child without supporting or rejecting any of the modelling activity. If a child became absorbed for an extended period of time with play in the landscape he or she had created, I would encourage them to complete the model first and explained that later we would have time to play in :

It was necessary to keep a record not only of the verbal exchange during the experiment, but also of the child's actions in relation to these changes. An abbreviated record of the experiment was kept for each child on a three-columnar table: the child's actions, the child's words, and my words. The child's actions were recorded in full, but it was only necessary to make brief notes of the verbal exchange for the entire modelling activity was recorded on tape. The two recording techniques were designed to provide a rich source of information for anticipated problems in the analysis of the model/maps, and as a record of the order in which the elements were placed on the paper:

Data Analysis:

During the summer vacation months following the modelling, the lightly penciled maps were rendered clear with ink outlines and names by two high school students. These giant maps, some as large as 30' x 30', were then photo-

graphed in color transparency form from a large precarious platform stretched between two step ladders. Because of an extremely limited budget, it was not possible to photograph with precise orthogonality. For this reason, these maps are not suitable for any precise metric analysis. The next step involved the projection of each color transparency on to an 11" x 17" sheet of paper, sketching it, and finally drawing a carefully inked schematic map using standardized symbols (see Figure 5-2: Key to Landscape Model Maps).

Two types of qualitative analysis were performed on these schematic maps. One, by three independent judges (including myself) was a general sorting of the maps into three categories following the three developmental levels of map representation formulated by Gary Moore, primarily from the theoretical perspective of Piaget (Moore, 1973a). This first analysis is designed to provide an independent measure of the level of organization that the schematic maps exhibit. I felt that by using the same system as the one carefully devised by Moore for analyzing the high-school students of Worcester, Massachusetts, an additional replicative value might ensue. Previous studies have used unique systems for analyzing maps (e.g., Appleyard, 1970; Bycroft, 1974; Ladd, 1970; Lynch, 1960). By using the same scoring system with a different age group, I anticipated that we would learn something of how different aged children represent the spatial properties of environments while testing and perhaps improving the overall utility of the scoring system.

The second analysis, scored by myself, was a detailed breakdown of the structure of each map, designed so that a reader can literally "see" how the children's landscape models differ and how I have analyzed them. These two systems are described separately below. A third analysis was a simple score of the extent of area mapped in an organized manner (i.e., in recognizable clusters) by the children.

1. Moore's General Scoring System of Spatial Organization

From our review of research on the cognition of large-scale environments, Gary Moore and I hypothesized that children's representations of the environment would be categorizable into three distinct levels in terms of the reference systems used: "egocentric," "fixed," and "coordinated" (Hart and Moore, 1971 and Appendix A-2). Subsequently, Moore elaborated these levels more fully for utilization in his analysis of high-school students' maps of the city of Worcester (Moore, 1973a). These levels, as described by Moore, are as follows:

Level I: Undifferentiated egocentric. Sketch map representations at this level are characterized by being concrete, egocentric, and undifferentiated; the elements of the sketch map are generally unorganized or organized only topographically in terms of one egocentric point of view or experience in the city; and there is no differentiation of other possible points of view (e.g., a particular concrete experience in the city represented by a string of streets related only by topological juxtaposition).

Level II: Differentiated and partially coordinated into fixed subgroups. Sketch maps at this level are characterized by the presence of one or more clusters of subgroups of elements corresponding to different areas of the city and the relative independence and lack of coordination between the clusters, such that the result is a sketch map in which there are one or more clusters where the relations among the elements within the clusters are at a higher level of organization than the relations between different clusters; and elements within the clusters may be related with approximate geometric accuracy whereas the relations between clusters may be only topological (e.g. two or more well articulated clusters corresponding to two or more different areas of the city linked by a single connecting street).

Level III: Abstractly coordinated and hierarchically integrated. Sketch maps at this level are characterized by an organization based on a coordinated and abstract reference system to which different elements and clusters of the city are related and to which they are subordinated: the organization extends across most of the sketch map; and the elements are related with approximate geometrical accuracy (e.g., a unified, comprehensive map organized in terms of a set of major traffic circles and interconnecting major arteries with angles, shapes, and proportional distances approximately accurate).

The complete instructions were slightly modified in language in order to be relevant to this study of modelling of a village instead of "mapping" a "city." The complete revised instructions and the criteria used by judges are presented in Appendix D.

2. The Detailed Scoring System of Spatial Organization

The detailed scoring system is illustrated in the form of a hypothetical set of maps (Map Figures 5-1a to 5-1j). They are each based on a simple hypothetical map resembling the center of Inavale (Map Figure 5-1a). This enables a reader to understand how I have described differences in the children's landscape models through qualitative analysis.

The spatial structure of each child's model map is analyzed by first breaking it down into clusters or groupings of elements. These clusters are determined by the spatial relationships of elements. Any grouping of at least three elements (includes roads as well as places) that exhibit a higher degree of spatial organization within the group than with other elements outside of the group, is identified as a "cluster." The five levels of spatial organization are:

1. No spatial organization even though the elements may be logically classified (1).
2. Linked (i.e., elements are joined by a known route or path).
3. Spatial proximity (i.e., elements juxtaposed according to their relative proximity to or separateness from each other).
4. Spatial order (i.e., elements correctly related along a linear sequence).
5. Positional (i.e., relative locations are accurate, front/behind and left/right).

It is important to note that these are not conceived of as "stages", "levels", or "thresholds" in any developmental manner; they are simply points along a continuum that has been designed by me to describe the type and extent of spatial organization expressed in the model maps themselves.

Having identified these clusters on a child's map, each cluster is numbered, using Roman numerals. Cluster I is the cluster surrounding the child's home, and so on, moving further away from the home until all of the clusters are numbered. The level of spatial organization of elements within each of these clusters is expressed as a number from one through five.

Having identified all of the clusters, the level of spatial organization between clusters is determined using the same five levels that are used for describing the level of spatial organization within clusters. In the cases where more than one type of spatial organization is found, the highest level which the majority of clusters reached, was the one used.

An "integrated map score" was arrived at by determining the average level of spatial organization within the clusters and multiplying it by the level of spatial organization between these clusters. The sequence of hypothetical maps are illustrated in a progression from least organized to most organized (Map Figures 5-1a to 5-1j).

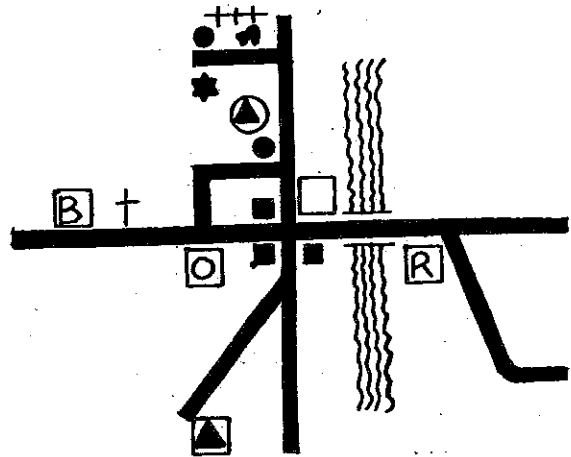
3. The Extent of Area Mapped

Because the modelling instructions were for each child to "show me where as many places are as you can," it was necessary for me to make some independent measure of the extent of area mapped. Some children's maps may be extremely well organized but only cover a very small area, whereas other children may choose to map a large area even though they do not know it well. What might therefore be scored as a qualitative difference in the maps of two children may in fact be largely an expression of different personality traits: one child being more careful than another. For this reason, an "extent of area mapped in clusters" score was developed. Unit scores were given to a child's

1 Some kindergarten and first grade level children, when modelling the environment, order the model elements into sets of objects with similar features ("logical classification"). While this is an interesting aspect of intellectual development, it is not included in this scoring system as the focus of interest here is the spatial organization.

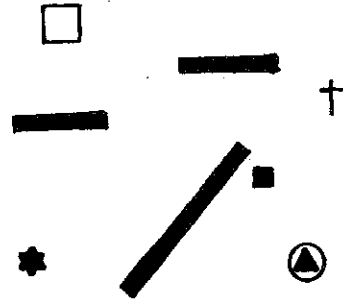
FIGURE 5- 1(a-i): ILLUSTRATED SUMMARY
of the DETAILED MAP SCORING SYSTEM

a. Accurate map of a
hypothetical town center.



b. No organization

Score = 1



- c. Some elements organized sufficiently to identify as clusters. No relationship between the clusters.

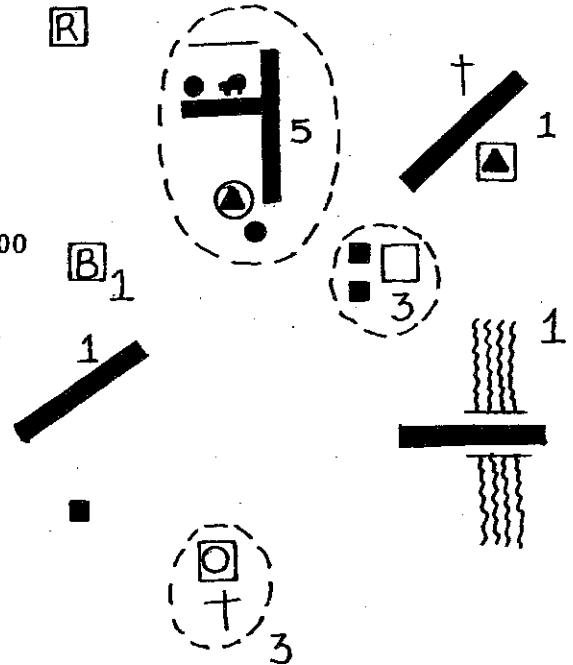
Scores Within Clusters:

- No recognizable clustering (1)
- Spatial Proximity (3)
- Ordered (4)
- Positional (5)

$$\text{Average Score Within Clusters} = \frac{1+3+3+5}{4} = 3.00$$

Score Between Clusters = 1

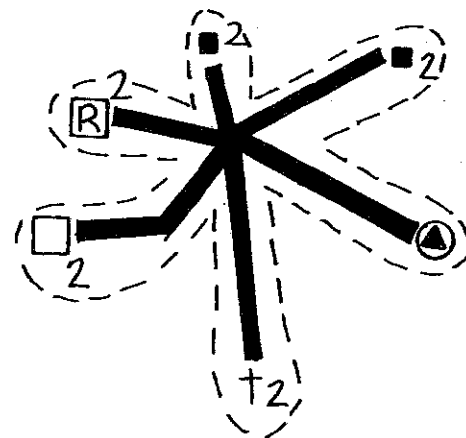
$$\therefore \text{Integrated Score} = 1 \times 3.0 = 3.0$$



- d. Majority of elements linked (i.e. connected temporally) and related by a common starting point.

Average Score Within Cluster = 2 (linked)

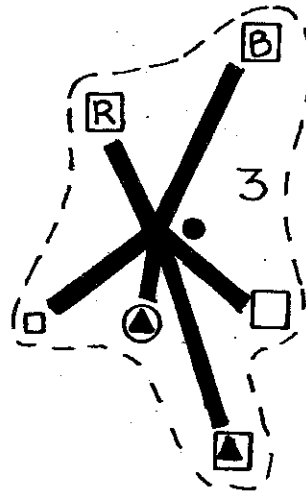
$$\therefore \text{Integrated Score} = 2 \times 2 = 4$$



e. One cluster only - Spatial proximity.

Average Score Within Cluster = 3 (spatial proximity)

∴ Integrated Score = $3^2 = 9$



f. Majority of elements organized spatially within clusters. Clusters related to each other only in terms of relative spatial proximity.

Scores Within Clusters:

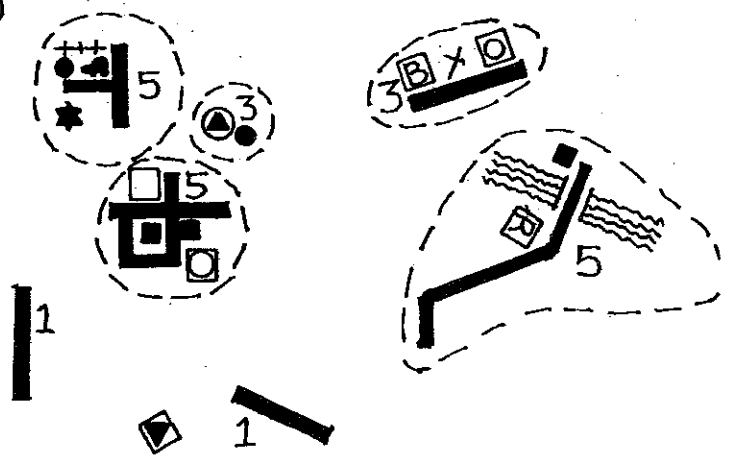
- No recognizable clustering (1)
- Spatial proximity (3)
- Ordered (4)
- Positional (5)

Average Score Within Clusters =

$$\frac{1+4+3+5+5+5}{6} = 3.83$$

Between Clusters Score = 3

∴ Integrated Score = 11.5



g. Majority of elements organized spatially within clusters. Majority of clusters related to each other at least in terms of spatial order.

Scores:

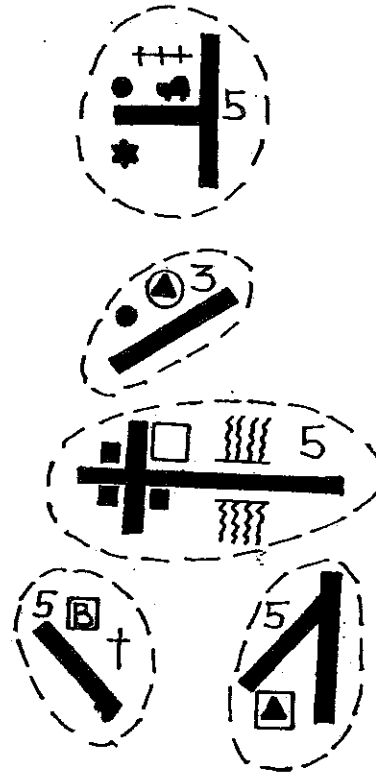
Spatial proximity (3)
Positional (5)

Average Score Within Clusters =

$$\frac{3+5+5+5+5}{5} = 4.6$$

Score Between Clusters = 4

∴ Integrated Score = 4x4.6 = 18.4



h. Majority of elements organized spatially within clusters. Majority of the clusters related to each other at least positionally (i.e. in their correct relative positions-front/behind and left/right of each other)
- Scale may vary considerably. Angles of roads may also be incorrect. Both problems are acceptable as long as the correct relative positions of the elements has been maintained.

Scores:

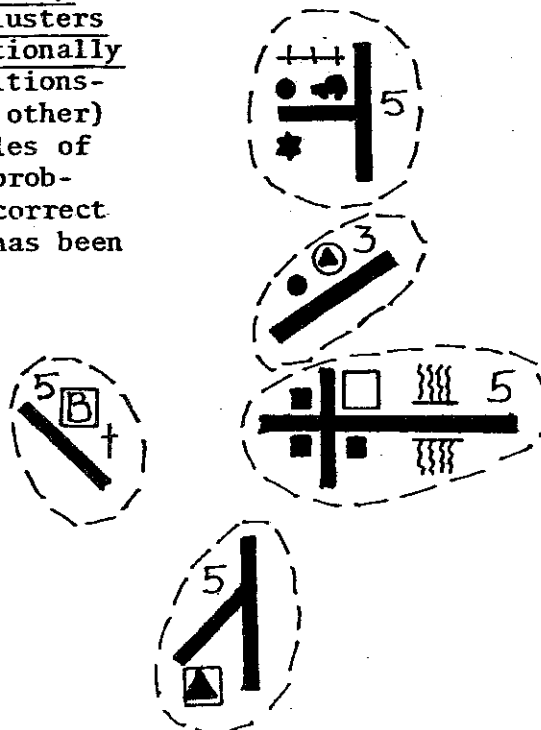
Spatial proximity (3)
Positional (5)

Average Score Within Clusters =

$$\frac{3+5+5+5+5}{5} = 4.6$$

Score Between Clusters = 5

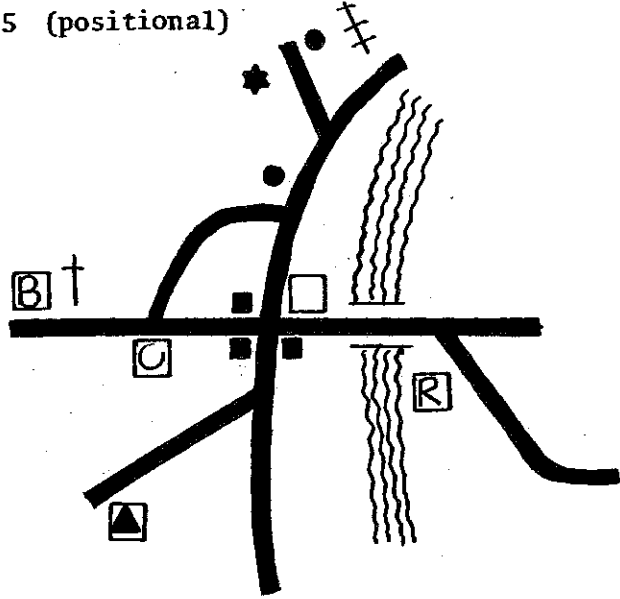
∴ Integrated Score = 23



i. One cluster only - organized positionally.

Average Score Within Cluster = 5 (positional)

∴ Integrated Score = $5 \times 5 = 25$



The above sketch illustrates what a map which adequately shows the correct relative location of elements looks like. The most advanced type of "positional" map would closely resemble Figure 5-1a, above. The elements of such a map would be located in their correct metric relationship to one another, with the angles and distances accurately preserved. Because the continuum from positionally correct to metrically accurate has no identifiable qualitative breaks, all maps along this continuum were scored at the same level, level five.

map for each area that was represented by at least three identified elements (roads were considered elements as well as buildings and other landscape features). These elements had to be spatially related to each other in at least a minimally recognizable manner (i.e. at least in terms of topological proximity). Because the clusters modelled by the children reflect the various distinct regions of the town and township, it was thought that these regions (as independently defined by three of the towns long-term resident adults) should be used to measure the extent of area represented by a child. The alternative, seemingly more objective, method of laying an abstract metric grid over the models presents serious problems of deciding which grid square(s) any particular cluster falls within. The regions of the town and township are as follows (for reference, see Map Figures 3-2 and 3-4):

1. The child's home with at least two other identifiable features.
2. East Main Street.
3. West Main Street.
4. The town center area (School Street/Field Lane).
5. Plum Hill.
6. Greenlawns Hill.
7. North Hill.
8. Snowdon Road.
9. Bear Hill/Brook Lane/Indian Lake circle.
10. Northville Road/Wood Lane circle.
11. White Mountain Road/Two Mountains Road circle.
12. Snow Peak Road/White Mountain Housing Development.
13. Lake Inavale/Grandville Road.

An overall "composite map score" was obtained for each map by multiplying the "integrated score" by the "extent of area" score.

Problems with the Method:

Fourth- and fifth-grade children were able to construct such large and complex maps that the modelling project would have taken many hours, and even days, per child. For this reason, I chose not to work with the fifth-grade children, even though they showed considerable interest in the models. The pre-testing demonstrated to me that, should anyone wish to spend as much as a few days working with each of these older children, on the models, they would discover, in contrast to Erikson's research with toys, that there is no resistance to the use of such landscape toys by girls or boys of 11 years of age (Erikson, 1963). However, even many of the fourth-grade children found it faster to do much of their map using pencil and crayons, usually after first using the blocks to lay out much of their maps. Occasionally this use of drawing led to the kind of problem discussed above: corrections are less likely to be made because they demand erasure rather than the simple moving of models. These mistakes become compounded until a map is produced which is in part a statement of the relative impulsivity in a child's use of a pencil.

I attempted to work in a limited manner with the fifth-grade children by asking them to draw maps on two feet square pieces of paper. The motivation

was so much less for this exercise that the maps were far inferior to the landscape models produced by the fourth-grade children, and the data was not used.

By using a hard flat surface as a base for the modelling rather than something malleable such as sand, the method suffered one major disadvantage. Children could not show me variation in topography. This troubled a few of the children of second-grade level and younger, especially the three children who chose to use crayons to draw roads rather than use the cardboard strips provided. These children drew the hills in side elevation because of a complete lack of familiarity with map drawing. In comparison, when using the models most children had no difficulty in figuring out how to lay them out in map style, because they so frequently play with toys this way. It seems that with crayon in hand the children move immediately into learned drawing skills by showing both hills and buildings in side elevation. In two of the three cases, the children complained about the problem immediately after drawing the hills and reverted to using the cardboard strip roads. The most common solution to their frustrations in using the cardboard strips on a flat surface was for them to tell me that a certain road should be a hill and for them or me, to suggest that we pretend, and write "hill" on the paper.

Toy people were purposely excluded from the set of model elements in order to stress my goal of discovering children's knowledge about places. The scale of the models would also have been a problem, for the older children seem especially unwilling to accept scale inconsistencies between elements. I did not, however, anticipate the great importance of animals. Animal places would undoubtedly have been more frequently included had toy animals been provided. This limitation, however, may not have been overly restrictive, for many children made animals and people out of clay. Others asked me if I had any toy animals, and in these cases I provided them (I could not arbitrarily offer these supplemental toys unless asked because some children had not had them, and I wished to keep the experimental situation comparable).

An additional problem with the landscape model elements was that for some children there were too many of them! Because of this, some children failed to realize that there were short lengths of cardboard strips suitable for use as driveways, and used longer ones, causing them to distort their maps. In those cases where I am certain this occurred because a child told me so, a note was made on the child's map.

One problem may have resulted from my use of the word "know" in the instructions, ". . . show me all the places you know . . ." This was interpreted by at least one child to mean that she should put down on the model only those places which she knew the name of, rather than any place she knew only the location of. Whenever I sensed there might be a reticence of this kind, I clarified the instructions to include places they could not name.

Place Recognition and Naming

Purpose:

To ascertain the extent of children's ability to recognize places in the large-scale environment beyond their homes, and to learn something of how they differentiate and name places and regions.

Data Collection -- (1) Recognition of Conventional Photographs

Color slide transparencies were taken with a 50MM lens. Photographs were taken at every break in the line of sight away from the center of the town, following all paved roads to a distance of one quarter of a mile past the built-up area (or to the end of the road in the case of cul-de-sacs). The photographs were taken from the sidewalks looking out along the roads. The assumption was that these would be the scenes most commonly experienced by all children in the town. An additional ten photographs presented key intersections out of town on the roads leading to the four surrounding towns. A few additional photographs were taken from various locations, including hill views, to provide visual coverage of the entire town. There was a total of 77 transparencies. They were projected in random order on to a screen to create a 4' square color image of each transparency.

A pre-test was designed with the series of slides to discover (1) the most suitable questions to ask the children, and (2) the number of slides the children would attend to before becoming bored and arbitrary in response. The pre-test was administered to the children residing outside of the research population of town children. It was decided that asking a child to name the slide was not a suitable procedure. Many places can be recognized which cannot be named. Also, asking for names seemed to disturb some of the children when the purpose of the slides was to encourage them to talk. On the other hand, a totally free situation where the children were simply asked to say what they thought of the pictures produced even less response. I found the most suitable approach to be when the children were told:

I have taken photographs of a lot of places which I would like you to see. I am interested in finding out more about these places. Tell me anything you can about any of these places that you think you have seen before. Also, if you think you know the name of the place or where it is, please tell me. This will help me use these slides to show and tell other children what Inavale is like.

The entire session with the child was tape recorded for later analysis.

Data Analysis and Problems with the Method:

This data was not suitable for aggregate analysis. It had been hoped that a scoring system would have enabled independent judges, familiar with Inavale, to score the performances of the children on this exercise.

Unfortunately however, whether a child was able to apply the correct adult-given place name or not, was the only quality which could readily be scored and this was the least interesting aspect of the data. A more accurate judging system would have required first transcribing all of the tapes, an immense and impossible task for this study. Consequently, the findings from this method are reported for individual children only (Chapters VIII and IX).

Data Collection -- (2) Recognition of Aerial Photographs

As a supplement to the recognition of conventional photographs described above, this method was devised to provide a more complete visual coverage of the town and of the landscape beyond. It was hoped that this would lead children to discuss regions as well as places and that I would be able to lead them, through probing, to discuss the landscape beyond the town and township. The sub-sample population of children were shown 12 aerial color slide transparencies of the town and were asked:

1. Do you know how these photographs were taken?
2. Do you know where it is?
3. Tell me as much as you can about the places on this photograph, and name any places you can.

In addition, the children were asked with specific photographs to tell me:

4. Where does this road (each of the roads) go?
5. (a) Which way does this river/brook flow?
(b) Where does it go?
6. What lies behind this mountain/lake?

The entire exchange was tape recorded.

Data Analysis:

This method was not conceived from the out-set to be amenable to any kind of aggregate analysis. By simply listening to a child's responses (on tape) in conjunction with the relevant landscape model, and the results of the conventionally photographed place-recognition test I hoped to obtain a more complete understanding of the sub-sample children's known worlds. The children of all ages were able to identify places on them to some degree. However, because no one has ever investigated how this aerial photography reading ability varies with age, this method is unsuitable for comparative aggregate analysis of place knowledge.

Findings

Age-Related Differences in Spatial Organization of the Landscape Models

Moore's Scoring System

Each of the schematic map reproductions of the models were sorted by the judges into one of three categories of spatial representation described above: (1) undifferentiated egocentric, (2) differentiated and partially coordinated into fixed subgroups, and (3) abstractly coordinated and hierarchically integrated. These maps were then ranked in order from the least to the greatest degree of organization.

The average percent of agreement between pairs of judges on the assignment of sketch maps to categories was 87.9 percent (1). The average rank-order correlation between pairs of judges on the sequential ordering was .85. These results confirm Moore's finding that "using written criteria describing three essential categories of spatial representation, judges naive to the study of and to developmental theory can independently and reliably order the maps from least to greatest degree of organization and reliably sort sketch maps of a city (town) into three categories."

Because of the high correlation in rank ordering of the maps, especially at the lower and upper levels (Level II was the most difficult to order) it was a very simple matter for the three judges to reconcile differences in their assignment of sketch maps to categories. Seven maps were assigned to Level I, 43 to Level II, and 13 to Level III.

A correlation analysis revealed a high level of significance ($p < .001$) in the relationship between age (i.e., grade level) and Moore's three levels of spatial organization (2). Moore had found that the high school seniors of his experiment organized their spatial representations of Worcester at statistically significant higher level than did the sophomores and juniors. However, he found no significant relationship between age and level of spatial organization. No doubt the great differences in intellectual ability which children aged four to ten years bring to bear on the task, as empirically demonstrated by Piaget, are more effective in influencing the quality of organization of the maps than any experiential differences between high school sophomores, juniors and seniors could be (c.f. Piaget, et al, 1960 and the review in Appendix A-2). But this is more than a question of

1 Percent agreements on assignments to categories between pairs of judges were .89, .89 and .86. Rank order correlations were .85, .89 and .79.

2 Because only two children out of the total population who participated in the landscape model test were in the "incorrect" grade level for their chronological age, grade-level groups may be considered to be equivalent to age-level groups. All of the statistical manipulations are summarized in Tables 5-1 and 5-2. Detailed tables of the statistical analyses are presented in Appendix B (Tables B-1 through B-14).

TABLE 5-1

RELATIONSHIP OF SPATIAL ORGANIZATION AND EXTENT OF LANDSCAPE MODELS
WITH AGE, ENVIRONMENTAL EXPERIENCE AND INTELLIGENCE QUOTIENT:
A SUMMARY TABLE OF THE PEARSON PRODUCT MOMENT CORRELATION ANALYSES

	Age	Free Range	Range With Permission	Range With Others	I. Q.
Moore's Score of Spatial Organization	r=.5054 p<.001	r=.3758 p<.05	r=.3095 p<.05	r=.3812 p<.01	
Spatial Organization of Home Cluster	r=.2853 p<.05	r=.2062 p= N.S.	r=.2787 p= N.S.	r=.2380 p= N.S.	
Spatial Organization Within Clusters	r=.4213 p<.001	r=.3419 p<.02	r=.4126 p<.01	r=.4184 p<.01	r=.2851 p<.05
Spatial Organization Between Clusters	r=.4534 p<.001	r=.3079 p<.05	r=.3034 p<.05	r=.3036 p<.05	r=.3697 p<.02
Integrated Score of Spatial Organization	r=.5109 p<.001	r=.3596 p<.02	r=.3698 p<.02	r=.3928 p<.01	r=.3440 p<.05
Extent of Area Mapped In Clusters	r=.6268 p<.001	r=.5150 p<.001	r=.4638 p<.01	r=.5330 p<.001	
Composite Score of Spatial Organization and Extent	r=.6037 p<.001	r=.5182 p<.001	r=.4485 p<.005	r=.5392 p<.001	
N	62	50	49	49	42

TABLE 5-2

SUMMARY TABLE OF THE CHI SQUARE ANALYSES OF SEX OF CHILD BY SPATIAL ORGANIZATION AND EXTENT OF LANDSCAPE MODELS (1)

Number of Clusters	8.506	4	P = < .10
Within Cluster Spatial Organization	11.118	2	P = < .005
Between Cluster Spatial Organization	4.870	2	P = < .10
Integrated Score of Spatial Organization	4.038	2	P = < .25
Moore's Score of Spatial Organization	7.368	2	P = < .05
Spatial Organization of "Home Cluster"	6.975	2	P = < .05
Extent Area Mapped to Clusters	5.616	3	P = < .25
Composite Score of Spatial Organization and Extent	4.436	2	P = < .25

1 The detailed frequency tables for the chi square analysis may be found in Appendix B.

intellectual ability. The detailed analysis of the maps reveals that there is a factor which has a marked effect on the organization of children's representations of the environment: the different degrees of children's opportunities to experience the geographic-scale environment.

The Detailed Scoring System

The findings show that the older a child, the greater the likelihood of there being a high average level of spatial organization of elements within the clusters of their map. The correlation analysis reveals a significant relationship at .001 level. The same high level of significance is exhibited in the relationship between age and the level of spatial organization between the clusters. As a result, the "integrated score" of spatial organization, which is a combination of these scores is highly correlated with age ($p < .001$).

None of this data are surprising. From Piaget's research on the development of children's conception of space and the many developmental "mapping" studies which have followed it, we would expect the level of spatial organization in children's maps to improve with age (see Appendix A-2). This, however, is only the beginning of the analysis. I was not satisfied with a conclusion that this age-related data simply reflects the intellectual development of the children as outlined by Piaget. I, therefore, made some different slices of the data in order to look in detail at the maps in relation to the children's environmental experiences. Through such probing of the data, one quickly realizes the naivete of taking intellectual development (as crudely approximated by chronological age) as the only variable worthy of consideration. A child's sex, home location, and parents' attitudes to spatial freedom, as discussed in the previous chapter, influence children's spatial behavior. It is suggested below that this, in turn, influences their ability to mentally represent, and thereby to physically represent (or map), the environment.

Sex-Related Differences

An extensive review of the literature on children's spatial cognition of the geographic environment had not suggested the likelihood of any significant differences in the performance of boys and girls (Hart and Moore, 1971). This is surprising because there is a very large amount of literature by psychologists reporting the inferior performance of females on tests of spatial ability (Saegert and Hart, 1978). Furthermore, other data from this investigation has revealed marked differences between the sexes in spatial activity (Chapter IV), and land-use (Chapter VII), the boys having both greater spatial freedom and opportunities to manipulate the environment. Because I suspected that differences in environmental experience would influence a child's cognition of the environment, I compared the maps of boys and girls.

Using the same analyses of the spatial organization of the landscape models, I made a chi square comparison of the girls' maps with those of the boys. The boys maps are significantly better organized. Using

Moore's overall measure of spatial organization, a chi square analysis revealed a significant difference between the performance of girls and boys ($p < .05$, Table B-2). This is also true of the detailed scoring of the maps "within clusters" ($p < .005$), "between clusters" ($p < .10$) and the "integrated" scores ($p < .25$; see Table B-7). In each case the greatest differences are with the upper levels of spatial organization (i.e., Level III of Moore's scoring system and Levels V and VI of the detailed scoring system). This means that far fewer girls produce clusters that are organized, either internally or between each other, in a positional or metric way. Approximately the same number of girls and boys produce clusters and maps which are organized in terms of spatial proximity or spatial order. I hypothesize that these findings are related, at least in part, to the significantly smaller size of girls' self-directed spatial ranges, "free range" and "range with others." If girls do not have the same opportunities to experience places directly, but must depend upon relatively passive observation from automobiles or second-hand verbal accounts, then we must expect them to have less ability to correctly represent the spatial relationships of places in that environment. I suspect that through the passive or vicarious experience of places, it is possible for girls, and other restricted children, to mentally represent these places in terms of their spatial proximity to one another or in their correct order, but that it is much more difficult to represent these places positionally or metrically. This question will be discussed further under the heading "Influence of Environmental Experience."

In the same way, we should not be surprised to discover that the spatial extent of environment represented in the landscape models by the girls is less than that of the boys, though this is not a statistically significant difference ($p < .25$; see Table B-9). As will be shown in the following section, the spatial extent of the landscape models is related to the size of spatial range, and as was revealed in the previous chapter, the spatial range of boys is significantly larger than that of girls.

The Influence of Environmental Experience

The greatest weakness of existing studies of children's cognition of large-scale environments has been their failure to consider the children's direct experiences in these environments as an independent variable. The age of a child as an approximation of "developmental age" (intellectual development), has been treated as the only important variable (Appendix A-2). Moore (1973a) attempted to recognize this weakness in his recent experimental study of asking his subjects about their degree of "familiarity" with areas of the city that they had been asked to represent.

Looking at the average level of spatial organization within clusters, we can see that the highest level of organization is found in Cluster I, around each child's home (Table 503). Forty-five out of the 63 children produced a "home cluster" which was organized positionally (i.e., at Level V). The relationship of sex and age with the degree of organization of these home clusters is much lower than with the maps as a whole (Tables 5-1 and 5-2). Particularly remarkable is the fact that eight of the 12 pre-school and kindergarten children (i.e., under seven years of age)

TABLE 5-3

AVERAGE LEVEL OF SPATIAL ORGANIZATION WITHIN CLUSTERS*

	AVERAGE LEVEL OF SPATIAL ORGANIZATION	N
Cluster No. 1	4.79	63
Cluster No. 2	3.70	44
Cluster No. 3	3.74	32
Cluster No. 4	2.76	21
Cluster No. 5	1.89	9
Cluster No. 6	1.75	4
Cluster No. 7	2.00	1
Cluster No. 8	2.00	1

* "Cluster No. 1" is the home cluster, "Cluster No. 2," the one with an element next closest to the home, and so on.

produced home clusters that are positionally organized such as those by Christopher (4:6) and Enid (5:11) in Map Figures 5-3 and 5-10 (1). This is important information for anyone wishing to combat those normative developmentalists who so readily apply chronological ages to Piaget's stages of intellectual development and thereby tell school teachers at what age children should and should not work with maps. Children can map places within their self-directed spatial ranges. Even the five-year-old children of this study produced useful maps of their home areas. Clearly there is no lower limit in schools for working with maps, if the approach taken is relevant to a child's environmental experiences.

In the review written with Gary Moore, we suggested from Piaget's research and from assorted studies of children's mapping that children of the pre-operational stage (approximately two to seven years of age) would represent the environment as a series of unconnected journeys they had made, each beginning with the home. As we shall see, this is true of much of the remainder of their maps (i.e., beyond the "home cluster"). Why then is it not true of this home cluster? Why should children like Christopher (4:6) and Margaret (5:0), be able to represent places around the home in the correct relative positions to the home (Map Figures 5-3 and 5-7)? I suggest that while building the model landscapes, the children imagine themselves somewhere around the doorstep of their home, looking out. In this way, they recreate this familiar view in a positional manner which they could not do if they depended upon the coordination of a host of separate journeys. It seems that the "egocentric" system of reference, which is characteristic of children at this age, can easily be "fixed" by children when they imagine

1 Throughout this chapter a child's age is expressed in years and months in parenthesis after his or her name, e.g., four years six months is (4:6).

themselves in their home (see Appendix A-2). In this way it becomes a "domocentric" (house-centered) system of reference. In our review of the subject, Gary Moore and I emphasized the importance of bodily locomotion in being able to build up internal representations of the geographic-scale environment. It was not possible for me to discover whether or not the children were mentally retracing routes back and forth from their home to the important places nearby - their swing, shed, tree, etc.; it may be that head and eye movements from a house window are all that is required in the development of a representation of the immediate environment around the home. That so many of the modelled "home clusters" are limited in extent to a few hundred yards around the home is probably related to what would be approximately the field of vision from the house.

It is no doubt because of the important influence of environmental experience, that the girls' models are on the average inferior to those of the boys, for as is clearly revealed in Chapter IV, girls' spatial ranges are substantially more restricted than those of their male peers.

One important implication of young children's dependence upon active environmental experience in their representation of the spatial properties of the geographic environment has been investigated by Lee (1963). Lee found that young children (six and seven years) bused to school in rural Devon, England, suffered serious problems of social and emotional adjustment in comparison to their peers who walked to school each day. He hypothesized that the bus journey took them beyond their known (representable) world into a space which they had had no opportunity to articulate through their own bodily locomotion through the environment. Because of this, he claimed, children felt separated from their mother, home, and the physical expressions of security. This he believed resulted in anxiety during difficult periods in school which accounted for their relatively poor academic performances, and relatively low ratings of social and emotional adjustment to school. I did not investigate academic or other teacher ratings of school performance in Inavale but the landscape models most dramatically confirm Lee's hypothesis that children younger than eight years of age cannot (with rare exceptions) incorporate the school bus journey into their topographical representations. The school is usually quite arbitrarily placed at the end of a short section of road which begins wherever the child catches the bus, some children from their home, others from the High School.

In order to more fully and more realistically discuss the influence of individual children's environmental experience upon their ability to spatially represent the large-scale environment, a sample of schematic maps of the landscape models have been selected to represent different points along the continuum from relatively unorganized to positionally organized (1).

1 A comprehensive monograph displaying and describing the complete series of maps will be available from the author (Hart, in process).

Christopher (4:6)

Christopher's landscape model clearly illustrates why many educators would have concluded that such young children cannot map (Map Figure 5-3). Most of the elements are seemingly arbitrarily placed. When one looks closely however, it may be seen that a small cluster of elements lying immediately around his home have been positionally related to one another. Though very small in area, this may nevertheless be called a map. The cluster is coincident with Christopher's small free range of movement: the house, tree and parking lot, and the small strip of sidewalk along North Hill Road (Map Figure 4-1). There did seem to be some attempts at organizing some of the remaining places according to their relative spatial proximity to the home, but because Christopher did this only in a one-to-one comparison manner the overall result was disordered. Christopher thought of each of the important persons (and animal) in his life and then found a model which corresponds to that person and located it on the paper; no spatial organizing principle was used.

Mark (5:6)

A common approach used by children under seven years of age in mapping their worlds is to produce a star-like pattern of places radiating from their home as the center point (Map Figure 5-4). Usually, as with Mark's model, elements appeared to be organized in terms of their relative proximity to the home (e.g. in this case the swing set is quite rightly located next to the home, Cape Cod is the further place and the Elementary School lies at a distance between the two) but the dominant organizing principle demonstrated is simply one of linkage to the home. An incidentally interesting feature of this model is the reference to Vermont as a place. It is common for children of this age to be thoroughly confused over the names of places and regions and how one contains the other. In addition to the question of a child's logical abilities, there is also the problem of trying to sort out all of the incoming place-name information. For example, a child asks what place they are going to during a car ride and the parent replies, "Vermont." When they arrive at an aunt's home it is not unusual that the child would think of that home from there on as "Vermont." Intellectual development and accumulative experience will hand-in-hand gradually bring to this child a more complete and comprehensible understanding of places and systems of place relationships.

Virginia (7:0)

Virginia produced a home cluster of friends' houses along a single strip of road using spatial proximity as the organizing principle (Map Figure 5-5). This was the extent of all that she could confidently represent. Her walking range is extremely small for her home lies on the very steep North Hill Road. However, the exercise required her to also locate the Elementary School and so she began rather arbitrarily locating the High School and Elementary School as well as her church and her father's store in town. These places are each linked to her home by separate roads even though they can all in fact only be arrived at via the North Hill Road. Because she

was unable to express how these three journeys were interrelated, she chose instead to show them as three separate routes.

An interesting feature of this map is that Virginia expressed changes in the steepness of the hill as bends in the road. This was probably the result of her insistence on using crayons to express the roads for I noted that when drawing it was easy for children to slip in and out of a different spatial perspective. This was not the case when using the model elements and toys, a further factor which supports their use for mapping activities with children.

Richard (5:9)

Richard made his model simply by stretching out one length of road and ordering his friends and favorite places along this road in terms of their perceived relative distance from his home (Figure 5-6). Cluster Number I accurately portrays the relationship of his home to that of his most common playmate, Paul, who lives across the street. The second cluster is more interesting. It portrays Richard's two most favorite places -- his frog pond and brook. In reality these two patches of swampy brook lie in Richard's and Paul's front gardens and the pipe runs underneath the street. Although internally well-organized Richard fails completely to integrate this second cluster with the first; instead of running under the street, it is placed parallel to it. The third cluster represents three of the four homes on his street which he visits most frequently. These three homes are correctly located relatively close to each other but again Richard makes the mistake of not placing one of them on the opposite side of the street. The fourth cluster placed, not accidentally, further away from his home expresses the home of his highly valued best classroom friend and an older friend (who has a good sliding hill), both of whom live close to each other, but on North Hill Road on the opposite side of the village. No attempt is made to rediscover the direction towards their homes by tracing the journey with his hands as some children do; it is sufficient to place them removed from his own home. The remaining two places, another friend's house and the Elementary School are also expressed in terms of their relative distance away from the home. As with other children of his age, Richard spent most of his 60 minutes on this modeling project trying to find the precisely correct shape and color for each of the houses and each of the cars portrayed on his model without applying a similar compulsivity to the correct spatial location of these elements.

Margaret (5:0 and 6:3)

The two maps produced by Margaret, one in her sixth year, and then again in her seventh year, are similar in the quality of their spatial organization but the second map is a little more elaborate and markedly more extensive in scale (Map Figure 5-7 and 5-8). This is an expression of at least three important changes in her life: moving house from the top of North Hill Road to Factory Lane, much closer to the center of town; walking to the High School to catch the large yellow school bus instead of waiting for the private car beside her home; and those changes in intellectual ability

which this investigation can only surmise about, but which undoubtedly occurred during the 15 month period. This report will focus on the likely influence of Margaret's environmental experiences.

While living at the top of North Hill at five years of age, Margaret's "free range" was limited to the immediate visually accessible confines of her home. The important places around her house are precisely located. In addition, Margaret was able to correctly locate the houses of two neighbors living over the brow of the hill (Cluster I). These she is allowed to visit with her seven-year-old brother by first asking permission. Similarly there are a number of families living across the street which she is also allowed to visit with her brother with permission, her mother knowing full well that the adults in those three homes will watch out for her daughter. Internally, this cluster shows the three homes in the correct spatial order but in relation to the home, it is simply located across the road. There is of course no practical reason why Margaret would need to represent these homes positionally, for Margaret can see her home from any of them and would have no difficulty returning to it any time. The paddock (Cluster IV), shows no spatial relationship whatsoever to the remainder of her map. It is located next to the Watson's house no doubt because it is they who own the horses ("logical classification"); the paddock is actually located on Wood Lane beyond Margaret's "free range." If she had been allowed to visit this paddock by herself she may have learned its location. As with all children of this age the journey to school is simply expressed as a short strip of road heading off in an arbitrary direction away from the place where the small "school bus" (car) picks her up each day (Cluster III).

Margaret's second attempt at modeling her known landscape expresses a considerably expanded world (Map Figure 5-8). She had only moved into her new house three months previously but, not surprisingly, she was already able to accurately map the elements around it (Cluster I). The second cluster of elements was also mapped positionally though it was not even linked to the home. As far as I could gather she had never walked to this town center area but had always been driven there by her mother. Why then should she be able to accurately represent the places there? I suggest that the answer is related to Kevin Lynch's concept of "imageability" (Lynch, 1960). The crossroads are spatially very distinct because of the equivalence and symmetry of the angles by which the roads intersect. This imageable quality of a cross was used as an organizing principle by the large majority of children in constructing their models. That the four buildings should be located in their correct relationship to each other is not surprising for three of them are stores with candy and toys and Margaret has bought items from them many times with her mother. The fourth cluster is an expression of Margaret's daily journey, sometimes on foot with her brother, to the High School where she waits for the school bus. She made no attempt to express the turns and different stretches of road on this trip probably because she had travelled it so few times on foot since moving house. Cluster III shows the route she has frequently taken on foot between her old home and new home and vice versa; no doubt such two-way trips help considerably with the common problem found in young children's mapping of not being able to reverse one's thinking in order to re-trace a route (see Appendix A-2). Cluster IV also shows the journeys to and from school. Margaret chooses to express the route via the mode she knows best, her mother's car, which she rode in from school

throughout her pre-school year. Except for the short strip of Factory Lane on which her new home stands, she expresses this journey as completely separate from the same journey to school taken in the school bus. In reality, they are with the exception of the final few hundred yards precisely the same route.

Ellen (6:0)

Ellen's map is similar to Margaret's in terms of the spatial organization of the clusters and the organizational mistakes made, but the overall, or composite score for her map is superior to Margaret's because she recognized the principle of relative proximity in the placement of these clusters (Map Figure 5-9).

An interesting feature of this map is that after placing models on the floor to represent her home and the two buildings either side of her home, she said she would draw the remainder of the houses because she knows just what they look like. She spends most of her days going back and forth along the small strip of sidewalk beside her home which is her "free range" (Map Figure 4-1). From here she looks across the forbidden territory of the North Hill Road to the church and houses. She knows their colors well and not surprisingly insists that she draw them on the model. To presume from this that she is unable to conceptualize a plan view of these houses is entirely unreasonable. As with their well-known freedom with perspective in picture drawing, children while map drawing may intentionally choose to distort the objective orthogonal view of the landscape in order to portray some elements that would otherwise be hidden. This is an entirely reasonable device which has in the past been adopted by the adults of many cultures.

Having accurately portrayed the buildings lying within her free range, Ellen added on to the same strip of road three commercial establishments which she frequently visits on foot with her mother. These are simply lumped together rather than being spatially ordered. The third cluster, involving the journey to school, is scored at an even lower level. The two elements of this map are simply linked through temporal experience. Ellen commonly visits Laurie's house after school and so it is placed further away from her home. In fact, Laurie's home lies much nearer to Ellen's home and in a different direction--West Main Street. When Laurie's mother drives the two girls after school to Laurie's home she does so via the town center crossroads, within sight of Ellen's house but this information has either not been picked up or, more likely, has not been assimilated into Ellen's cognitive representation of the environment. There is no reason why it should have been, because she has never had the opportunity to navigate the route; she simply knows that the car drops her at Laurie's house after school has finished--Ellen considers this the important thing to represent.

Enid (5:11)

Enid's map is typical of many produced by children of kindergarten and first grade level (Figure 5-10). It reflects directly the extent of her contact with the world. Cluster I was built first. It is a detailed expression of her neighbors' homes and some of the other important physical features lying around her home. The extent of this "home cluster" is precisely coinci-

dent with the shape and extent of her walking range without her mother (see Map Figure 4-1). The features within this cluster are positionally located.

Enid went on to draw the hill down to the town center (Cluster II). She had, it seems, made one or two walking trips "down street" with her mother but clearly she had not learnt much about the location of places from these trips; no doubt the responsibility for making decisions one's self about orientation and navigation is very important in the formation of topographic representations. She remembers the house at the end of her road where her school bus turns to go down the hill, for each morning the bus stops there to pick up some children, but the direction of the turn itself is completely wrong. The most likely reason the hill road took the direction it did is the result of a common problem with children of this age in the expression of slopes in a two dimensional surface. At the time of building this model, Enid was sitting on the map facing south; naturally she would draw the hill going "down", i.e., toward the "bottom" of the page. (See also Figure 5-5 by Virginia.) This is a drawing convention she has learned and there is nothing unusual about it being applied to strips of black card road. It is noteworthy however that no Kindergarten children complained about the problem of expressing topography. The first examples of this were found amongst first grade children.

Having drawn the hill Enid remembered the Elementary School and so looked for buildings to represent it as well as the associated farm buildings where one of her classmates lives. These three buildings are rather carefully placed, beginning with the school, followed by the farm house and, in the distance the "sugar house" which she had recently visited to see maple syrup being made. The principle of beginning with places that can be seen from some well-known starting point (in this case the school), and expanding outwards to places visually accessible and then on to places less accessible seems to be a most common system, producing a useful, ordinaly organized map or map cluster.

Finally, Enid joins this school cluster to her home cluster by mentally returning home and retracing her daily school bus journey. It is notable that she, and all other children chose to proceed from home to school in this task rather than from school to home, even though the return journey has of course been made precisely the same number of times.

Martha (8:7)

Martha's map is an excellent example of the effect of very limited environmental experience upon the landscape model of a child with an otherwise high level of ability to spatially organize places (Figure 5-11). It is also another classic version of the effects of relying upon symmetry in the environment as an organizing principle when that symmetry does not really exist, as previously illustrated with Margaret's map (Map Figure 5-8) and as first illustrated by Kevin Lynch with people's representations of Boston Common (Lynch, 1960).

Martha begins by laying out the highly "imageable" cross roads in the town center. She then confidently fills in all of the details of East Main Street which she knows so well because her free range embraces this area

(Cluster I). In laying out this basic cross however, she wrongly identifies Snowdon Road as Plum Hill Road. Plum Hill Road actually lies between Snowdon Road and East Main Street which it intersects obliquely. The effect of this single mistake is that she cannot integrate her otherwise well-known cluster Number II. This second cluster has been visited by her on occasions but not so frequently for her to recognize her mistake. This third cluster is correctly located positionally even though it is not linked to the first cluster. The third cluster is also in the correct relative position but as with most of the children younger than third grade level Martha is completely unable to integrate the school bus journey with the remainder of the model. One reason Martha may have had difficulty with this task is that she has lived in the town for only one year, just long enough to qualify for participation in this study. During this year she had made no walking or cycling trips, alone or with others, beyond the daily walk to the high school. As will be shown in The Family Studies (Chapters VIII and IX) two boys who are two years younger, but have experienced an extended and frequent set of trips on foot into the town, are able to produce landscape models which are better organized and more extensive than this girl who is the number one performer in her class standardized tests of intelligence and academic performance.

Casey (9:11)

Casey's model of Inavale is an example of the most advanced type of spatial representation (Figure 5-12). Furthermore, it extends well beyond the limits of the town. It is therefore necessary to refer back to Map Figure 3-4 to identify the actual location of the out-of-town place names. The model reflects a most extensive direct experience with the town, working in combination with the improved powers of spatial logic which come with intellectual development. That a greater proportion of such maps were produced by boys, more than likely reflects the importance which experience plays through differences in the extent of children's "free range" and "range with permission" correlates highly with the degree of spatial organization exhibited in the models. However, only a very carefully designed study which partials out the important contributing effects of environmental experience could say whether or not the inferior performance of girls on this (or any other) measure of spatial organizational ability is due entirely to differences in experience or whether there are some important biologically-given factors operating differentially in the two sexes.

The only structural mistake made by Casey was the failure to realize that the Wood Lane and the Lake Road beaches are both located on the same lake. This same mistake was made on all maps of the younger children who mapped a lake at all. Questions put to the children after their models were complete confirmed that they had no idea it was the same water mass. Such anomalies in our knowledge remain with all of us as so much of our language is related primarily to function--this place for swimming, that place for launching boats, etc. However, as the following model clearly illustrates knowledge goes beyond such functional narrowness; there is an interest in knowing about environments beyond those which one has specifically used.

Elliot (9:8)

Elliot chose not to use toys because he says he knows so many places. His free range is unlimited and he may cycle anywhere but Snowdon Road. This final map dramatically illustrates how much children's ability to spatially represent the environment develops in the period from four to ten years of age. The first map of this series was produced by Elliot's young brother, Christopher (4:6). Christopher gave spatial organization only to his home, favorite tree and family car in relationship to the street. While recognizing that these model-maps express only performance and hence are not truly direct measures of children's competence, the strong suggestion remains, from the gross improvements revealed in the aggregate data and these examples, that children have gradually developed a spatial perspective on the world. Furthermore, Elliot's model illustrates that this place knowledge extends beyond any particular direct experiences he has had with the places. He has inferred much about the world; he has been thinking in the manner which Piaget has labelled "formal operational" (see Appendix A-2).

Elliot has never ridden all of the way around the Snowdon Road-Farm Hill Road-Middleton Road loop but he has seen people return from Indian Lake Beach to town in their cars in the opposite direction from his father's car and so he infers this loop and guesses the lakes' approximate location. Similarly, he has never boated on Lake Inavale, but he has heard that the Lake Road Beach and the Wood Lane Beach are part of the same water mass and so, he fairly accurately infers and sketches in the shape of the lake.

Relation to the Intelligence Quotient

If I.Q. (intelligence quotient) tests are an approximation of "intelligence," and if children's ability to spatially organize the geographic environment in model form were largely a function of intelligence, we might expect intelligence to be the most important variable influencing the spatial organization of the maps. There is no basis for such a conclusion in the data. In fact this variable was somewhat less significantly correlated than were many of the experiential ones.

Relation to Social-Emotional Health

It is worthy of note that the three children of third grade level or older who produced extremely disorganized maps were each children whose schoolteachers felt had considerable social-emotional problems. Because none of these poor mappers were in my sub-sample of children I can offer no insights into the possible relationship of a child's spatial world and their social-emotional well-being. While there is quite a large body of literature on the spatial world of disturbed individuals, I am not aware of any research on the relationship between the representation of an individual's geographical-scale world and their mental health (see Searles, 1960). This would probably be a valuable area for research.

★ Home	BG School bus garage
▲ Relative's home	V Vacant building
⊙ Elementary School child's home	TG The Town Garage
▲ House - named	ES Elementary School
△ House - unnamed	HS High School
● Garage	DR Doctor's office
† Church	SKI Ski lodge
⊞ Church School	● Barn, shed, sugarhouse
● Gas station	--- Wall
■ Store	†† Fence
P Police station	M Manufacturing
F Firehouse	▒ Lake
S Supermarket	▒ Woods or bushes
R Restaurant	☪ Trees
I Inn, lodge, motel	▒ Grass
B Bank	⋈ River
BA Bowling Alley	□ Other keyed individually on each map
O Office	▨ Snow
PO Post Office	⬡ Sign
L Library	

FIGURE 5-2: KEY TO MODEL LANDSCAPE MAPS

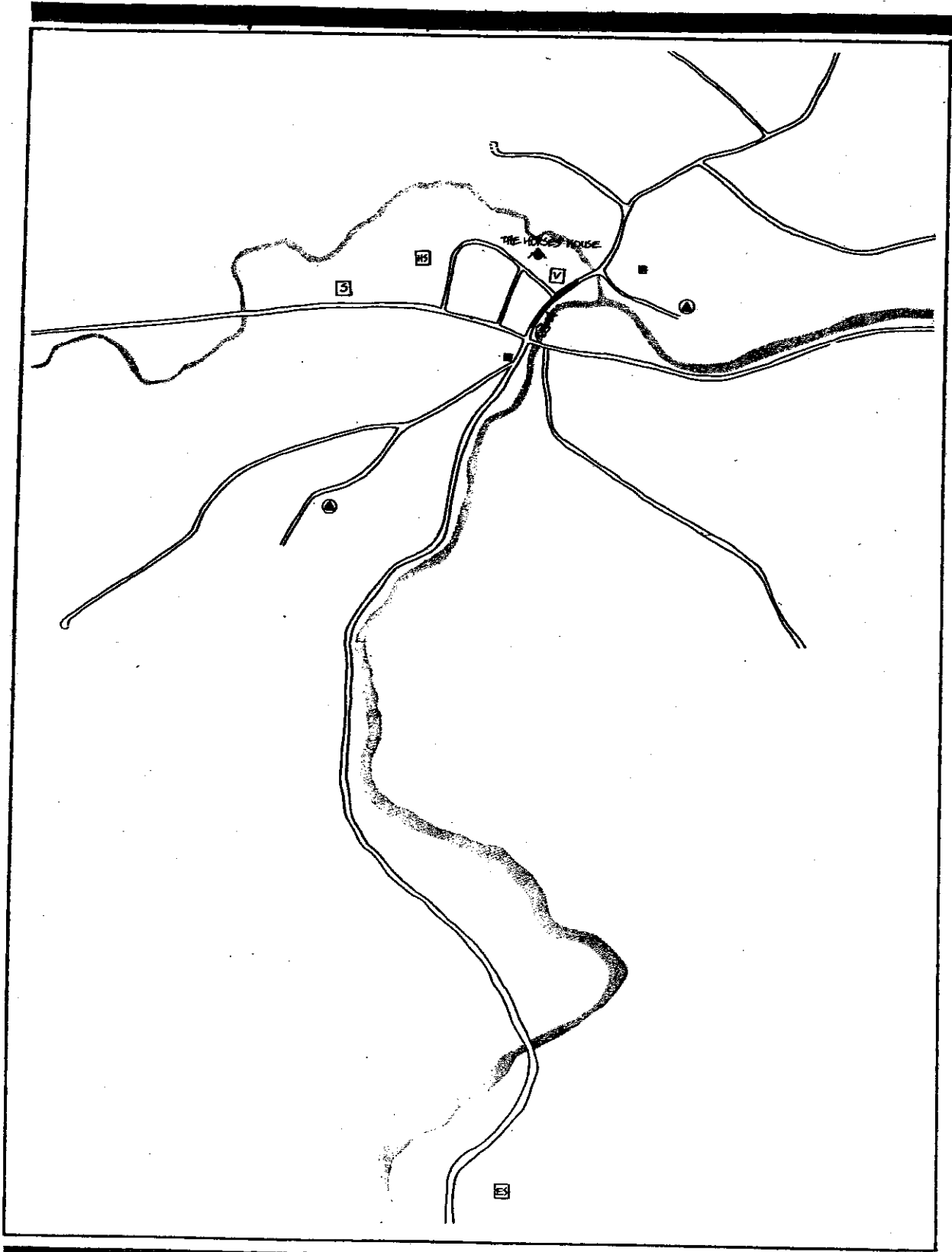
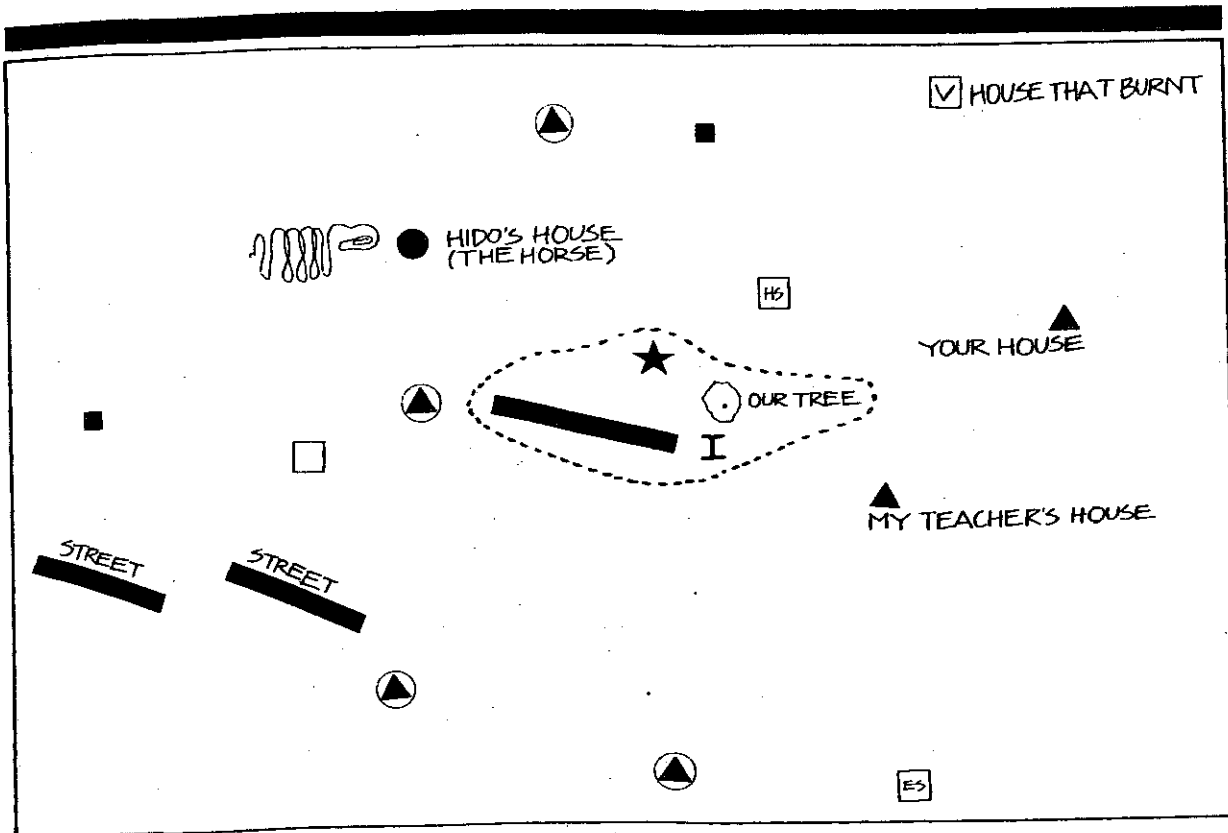


FIGURE 5-3a:CHRISTOPHER(4:6)-CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

I - Score 5 (positional)

II - Score 1 (no spatial organisation).

Between Clusters:

Score 1 (no spatial organisation).

$$\therefore \text{Integrated Score} = \frac{1(5+1)}{2} = 3$$

Extent of Area = 1

$$\therefore \text{Composite Score} = 3.$$

FIGURE 5-3b: CHRISTOPHER(4:6) - LANDSCAPE MODEL

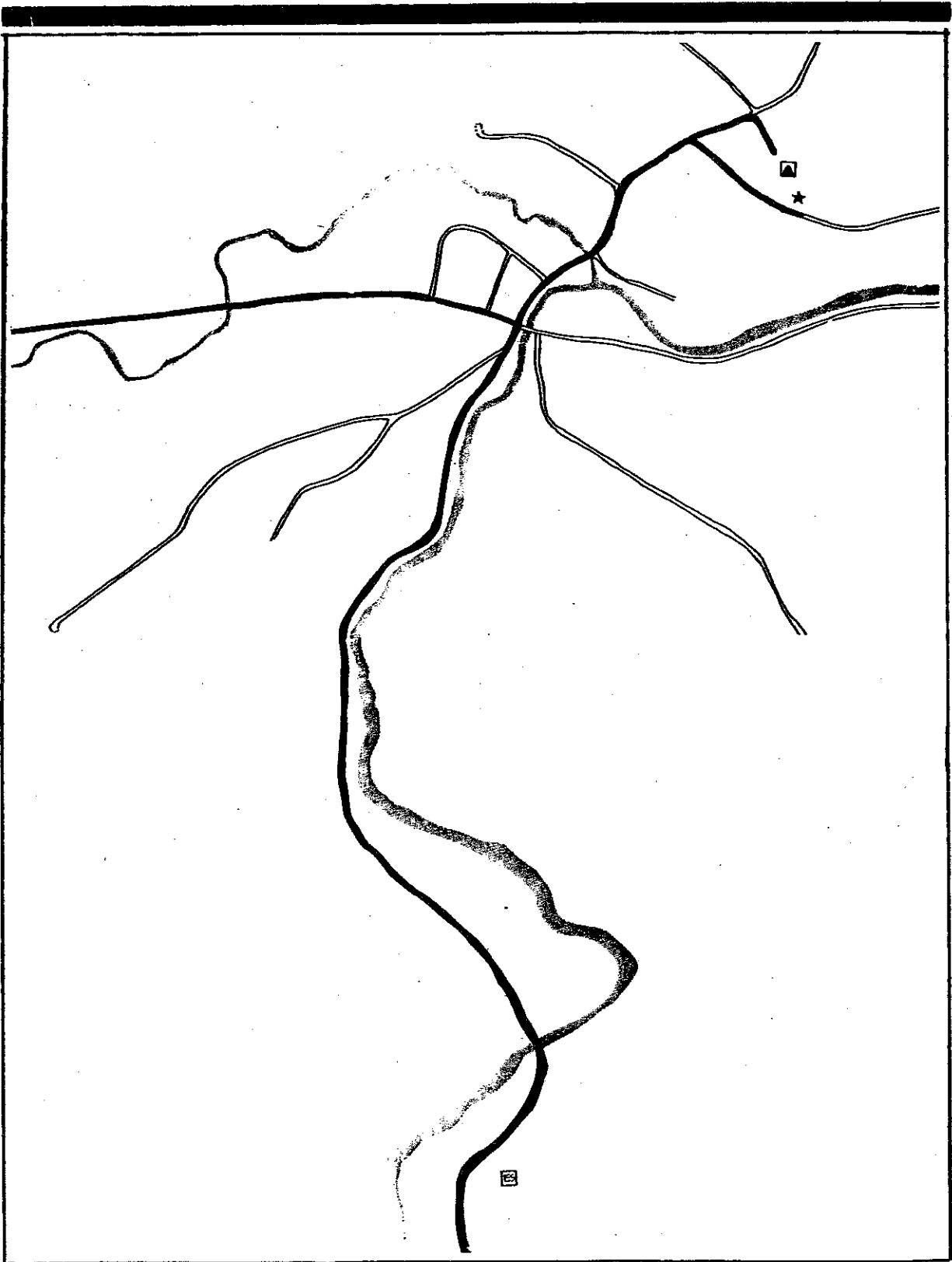
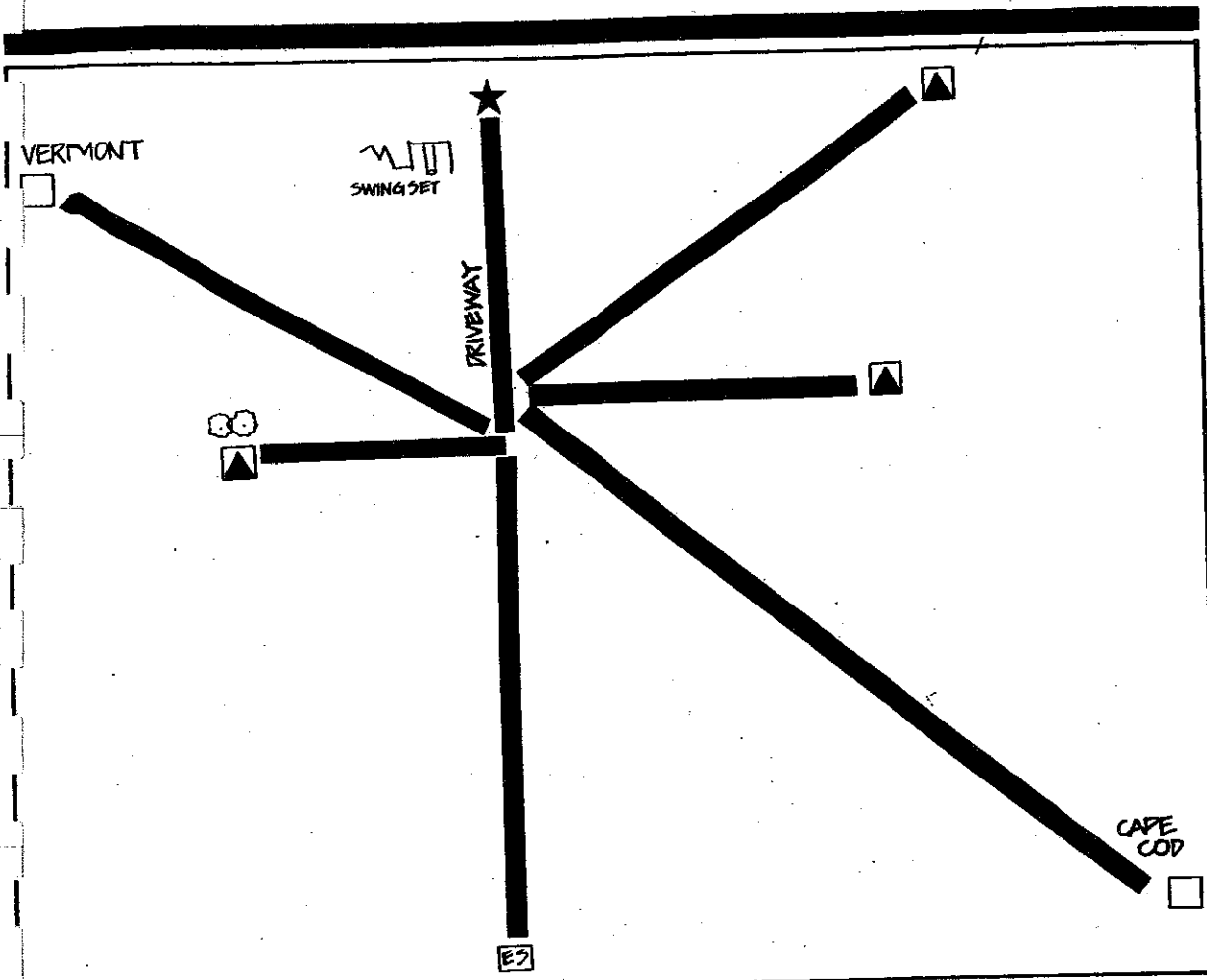


FIGURE 5-4a:MARK(5:6)-CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

Just one cluster - Score 2 (linked)

∴ Integrated Score = 2 X 2 = 4

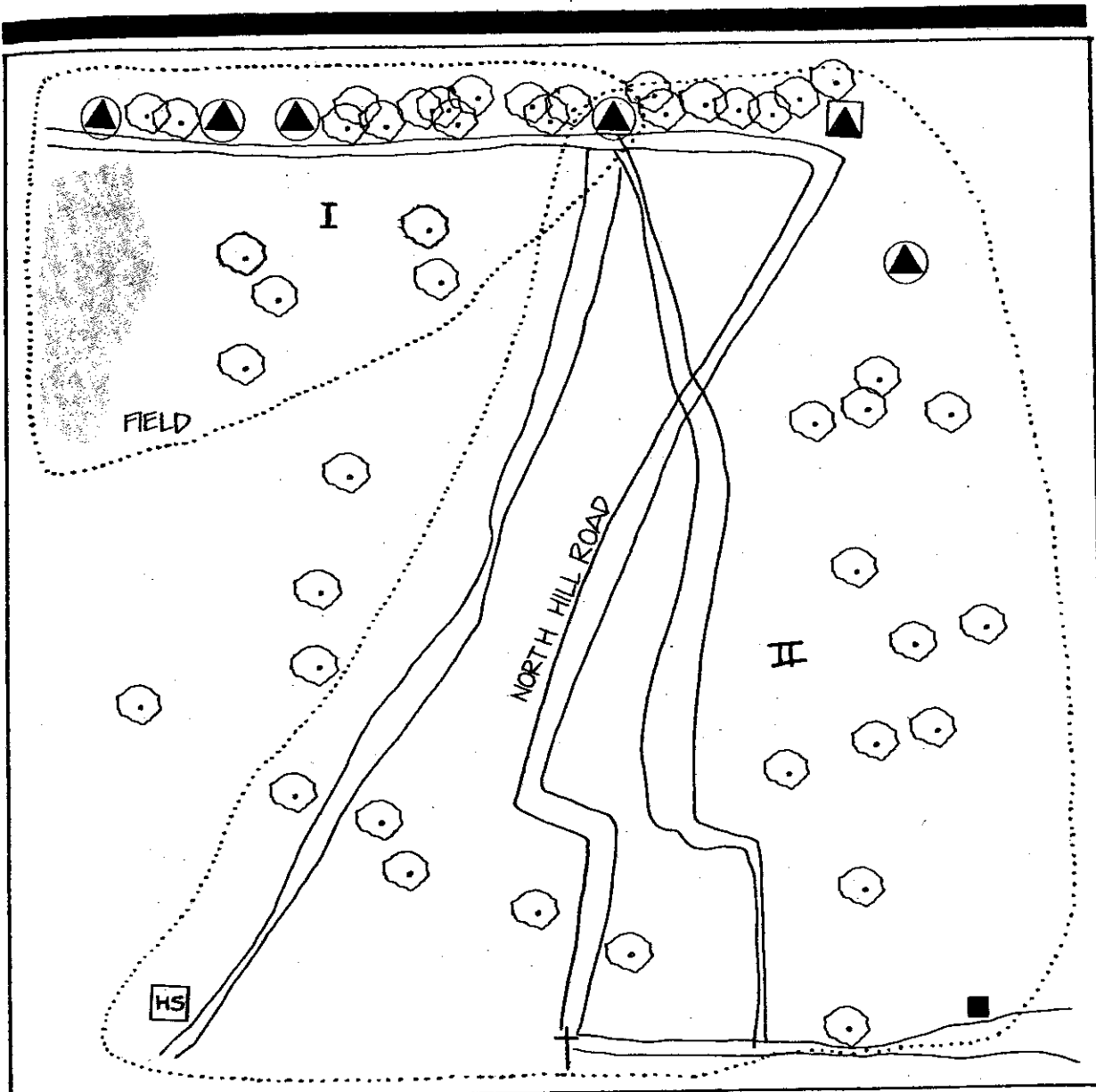
Extent of Area = 1.

∴ Composite Score = 4.

FIGURE 5-4b: MARK(5:6) - LANDSCAPE MODEL



FIGURE 5-5a: VIRGINIA(7:0)-CONTENT ANALYSIS OF LANDSCAPE MOBEL



Within Clusters:

I = 3 (spatial proximity)

II' = 2 (linked)

Extent of Area = 1.

∴ Composite Score = 5.

Between Clusters:

2 (linked)

$$\therefore \text{Integrated Score} = 2 \frac{(3+2)}{2} = 5$$

FIGURE 5-5b: VIRGINIA(7:0)-LANDSCAPE MODEL

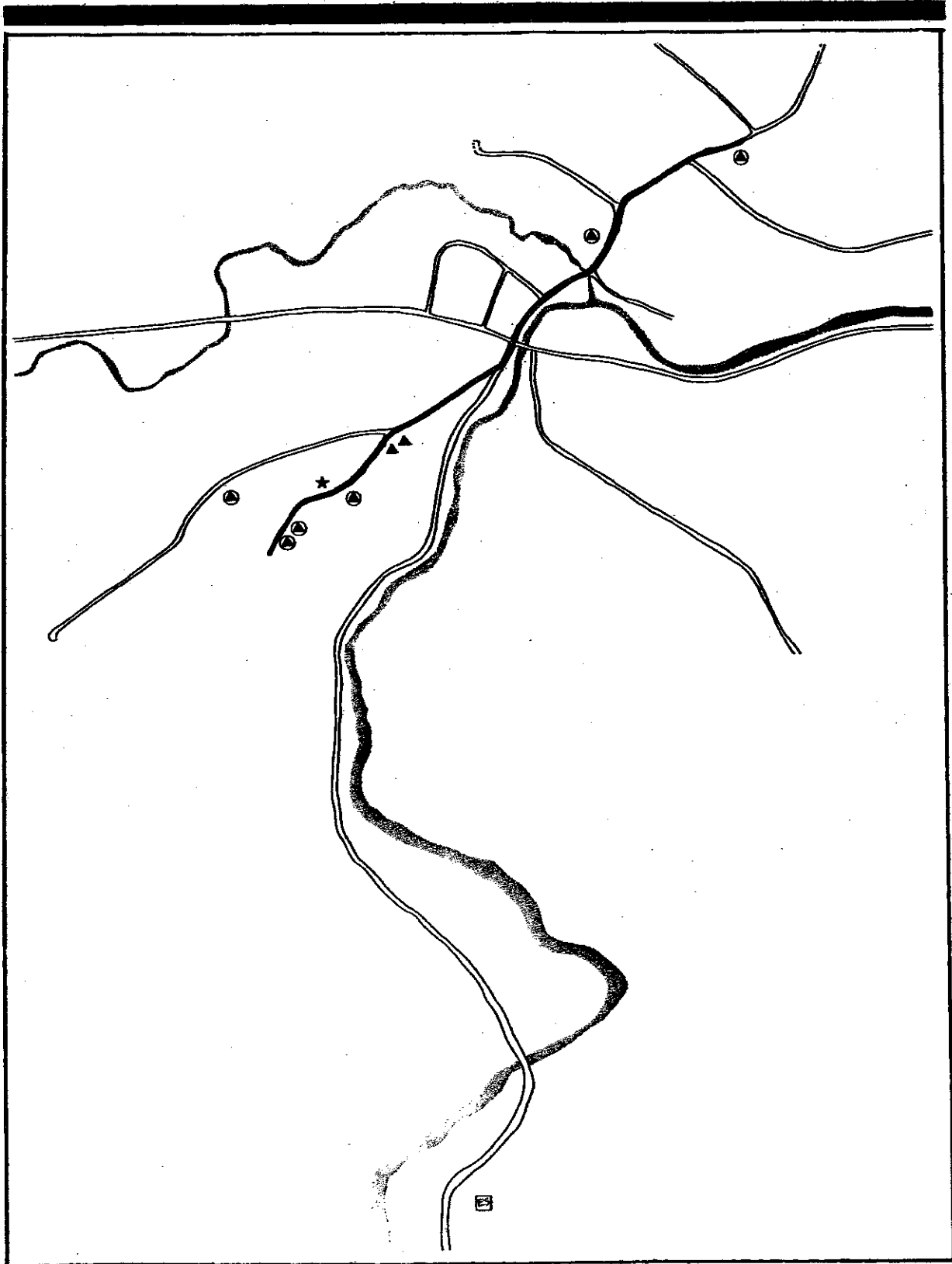
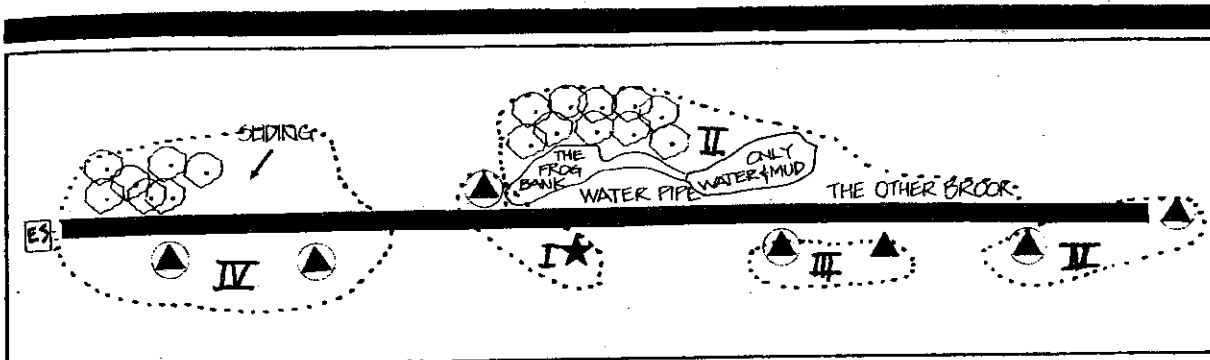


FIGURE 5-6a: RICHARD(5:9) - CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

- I = 5 (positional)
- II = 5 (positional)
- III = 3 (proximity)
- IV = 3 (proximity)
- V = 3 (proximity)

Between Clusters: = 3 (proximity)

∴ Integrated Score = $\frac{2(5+5+3+3+3)}{5} = 11.4$

Extent of Area = 1

∴ Composite Score = 11.4

FIGURE 5-6b: RICHARD(5:9) - LANDSCAPE MODEL

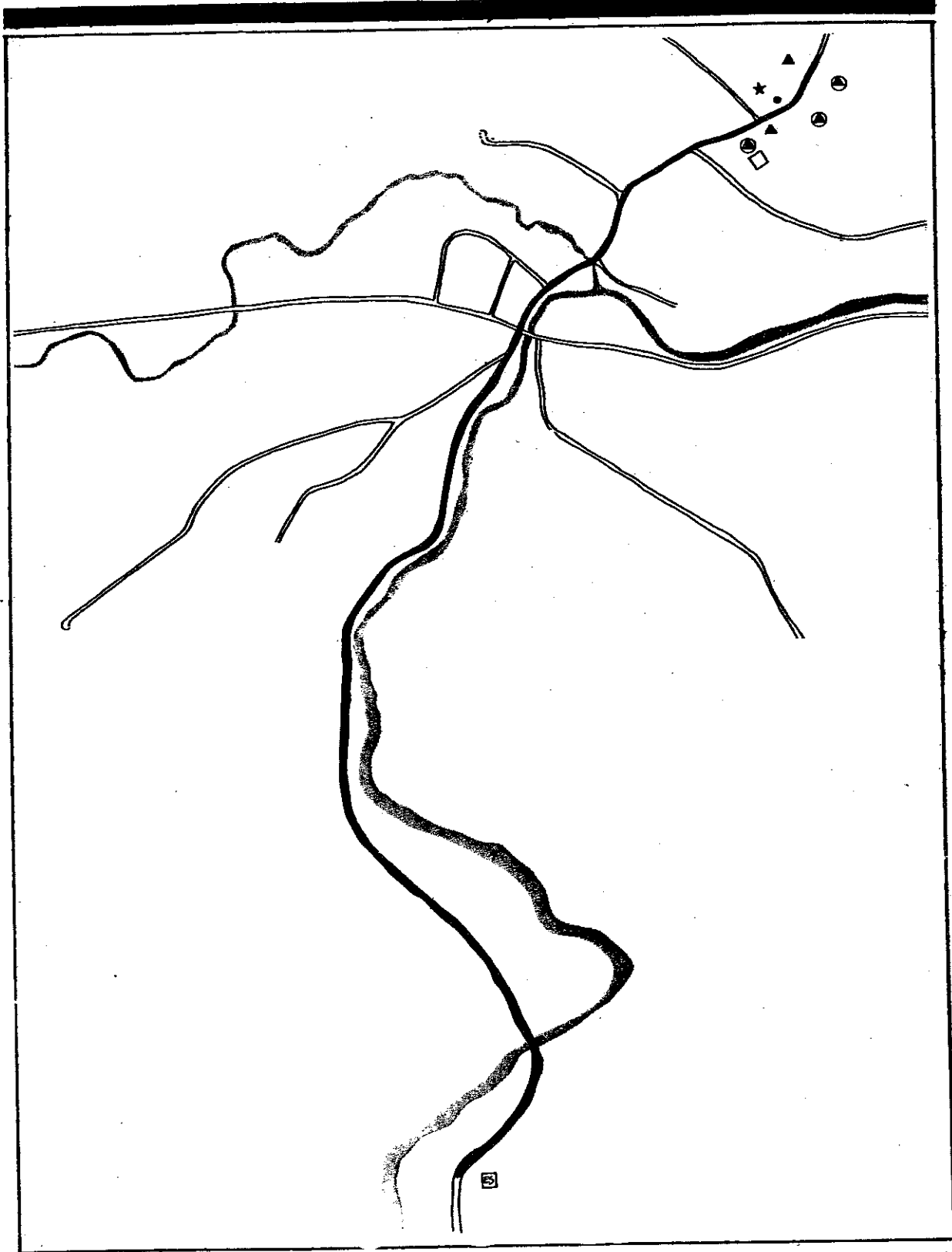
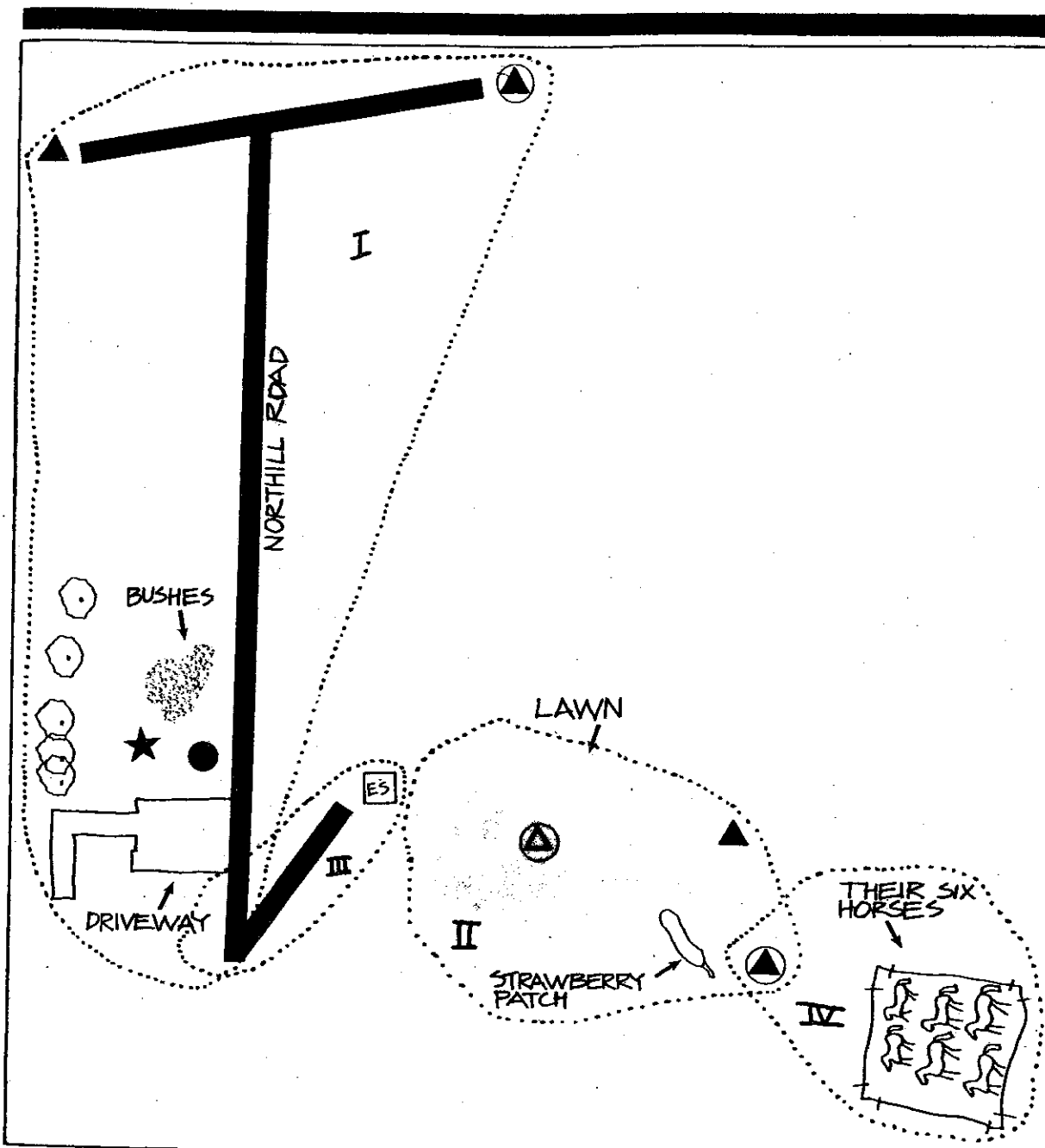


FIGURE 5-7a:MARGARET(5:0)-CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

- I - Score 5 (positional)
- II - Score 4 (order)
- III - Score 2 (linked)
- IV - Score 1 (no spatial organisation)

Between Clusters:

Score 3 (proximity).

\therefore Integrated Score = $3 \times \frac{(5+4+2+1)}{4} = 9$

Extent of Area = 2

\therefore Composite Score = 18

FIGURE 5-7b: MARGARET (5:0) - LANDSCAPE MODEL

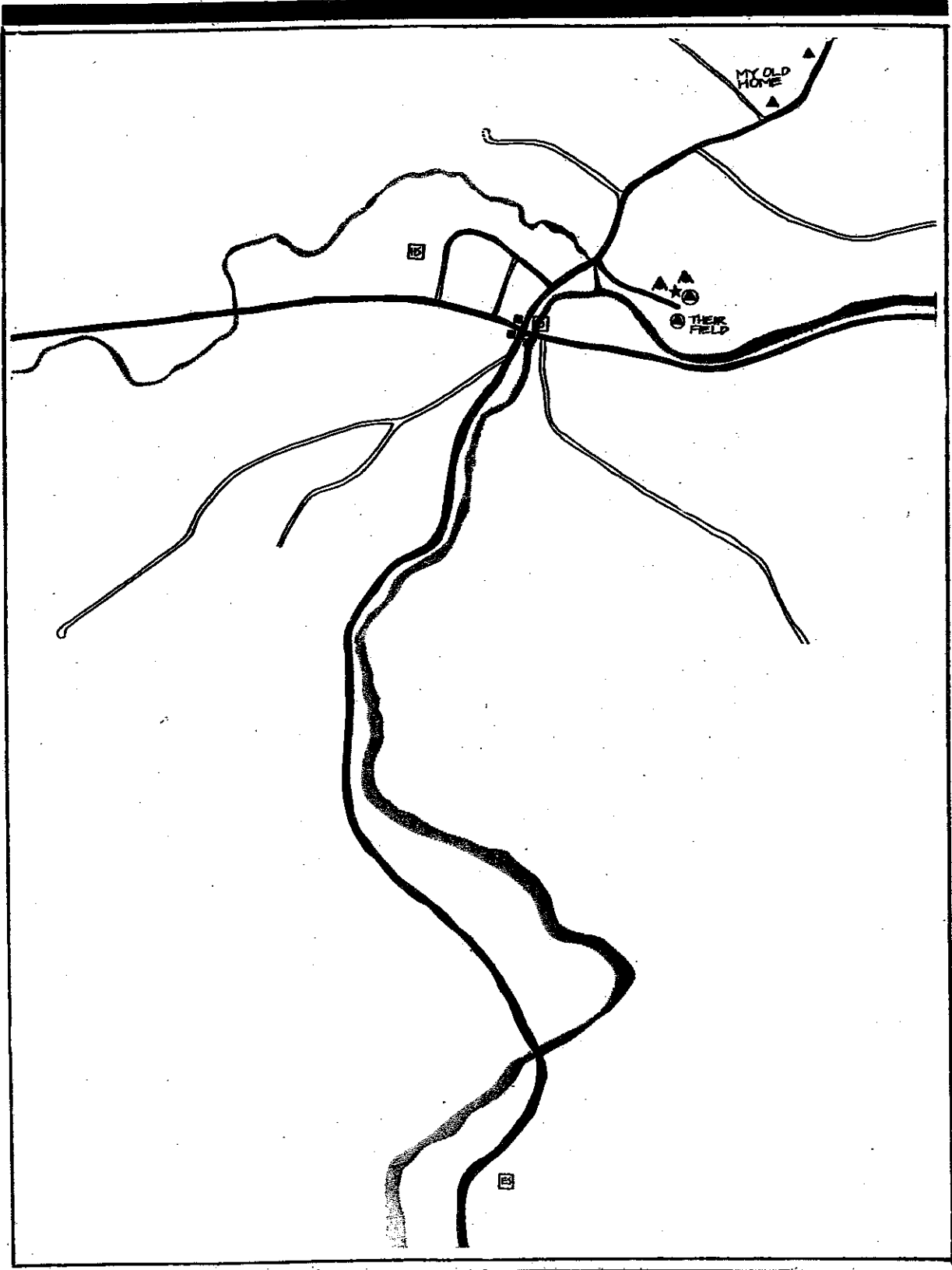


FIGURE 5-8a:MARGARET(6:3)-CONTENT ANALYSIS OF LANDSCAPE MODEL

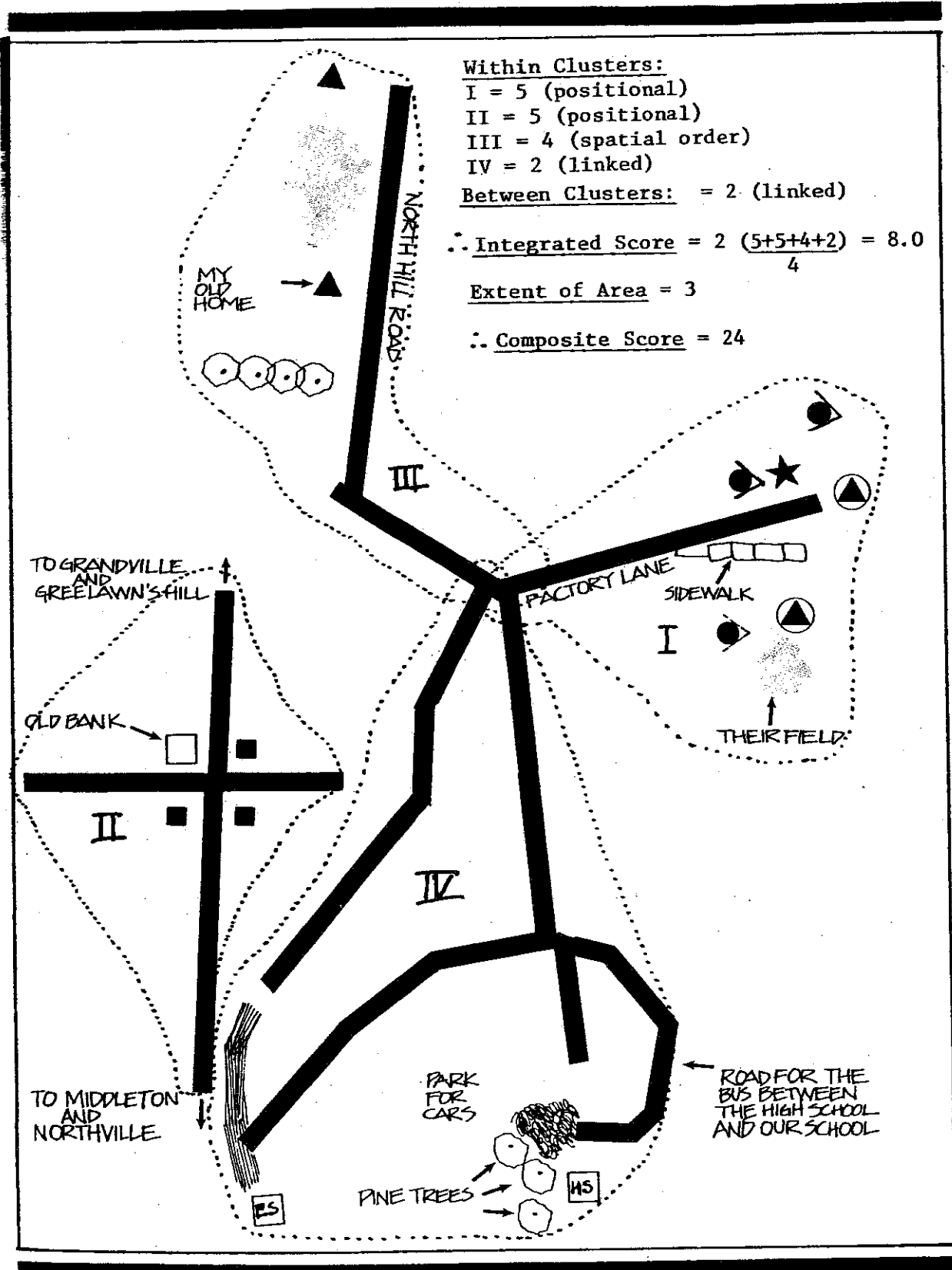


FIGURE 5-8b: MARGARET (6:3) - LANDSCAPE MODEL

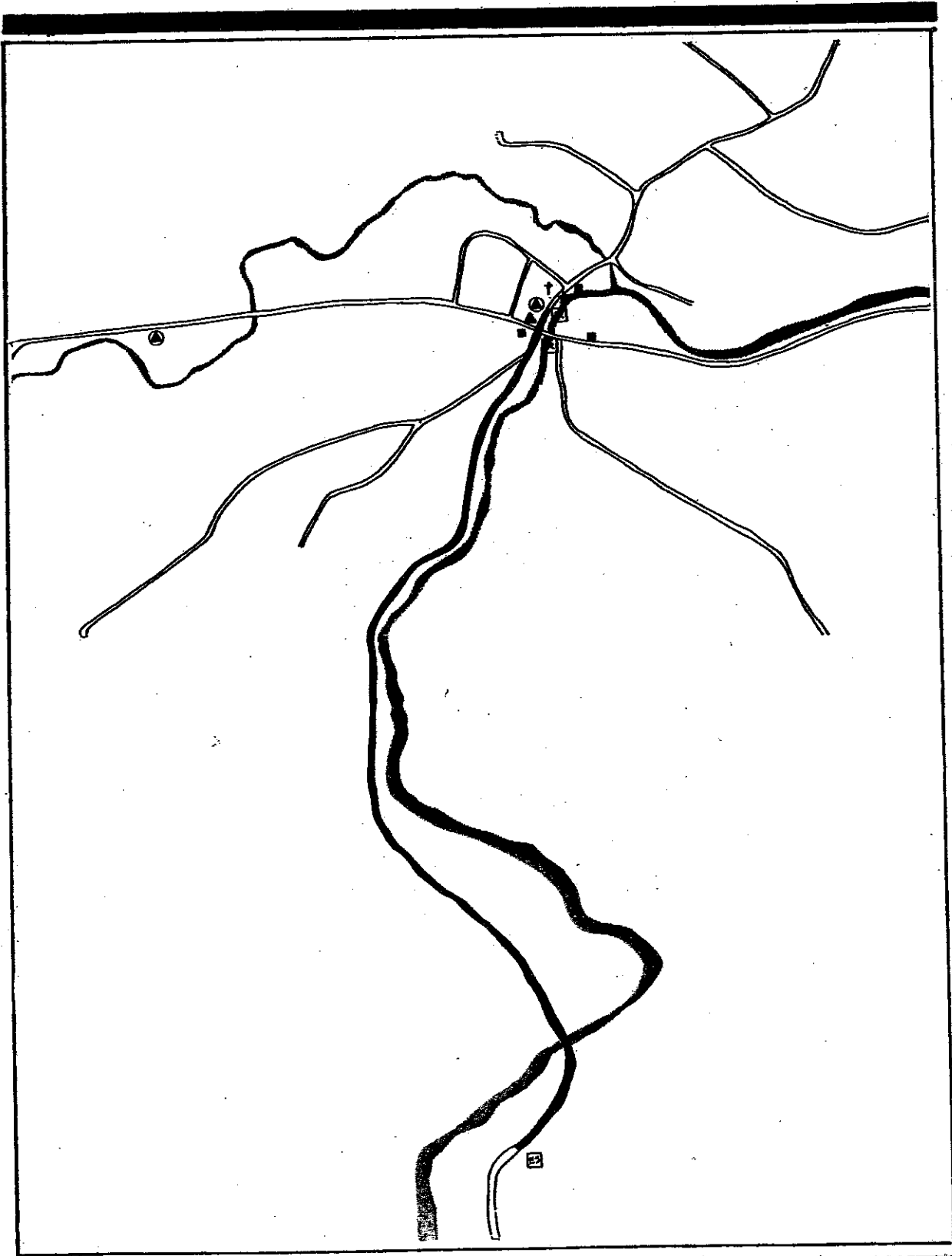
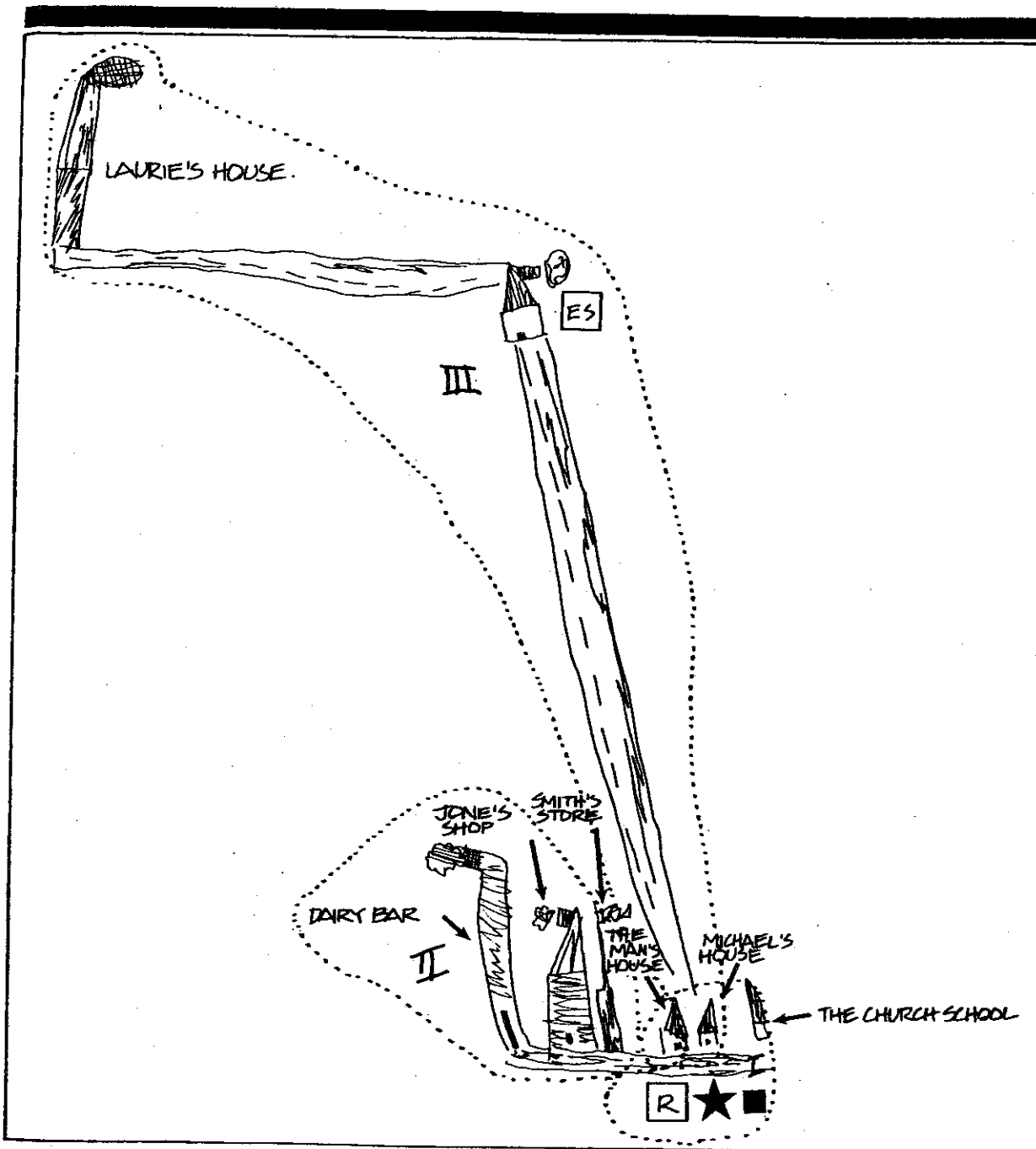


FIGURE 5-9a:ELLEN (6:0)-CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

- I = 5 (positional)
- II = 3 (spatial proximity)
- III = 2 (linked)

Between Clusters: = 3.0 (spatial proximity)

Integrated Score: $3\left(\frac{5+3+2}{3}\right) = 10$

Extent of Area = 2

∴ Composite Score = 20.

FIGURE 5-9b: ELLEN (6:0) - LANDSCAPE MODEL

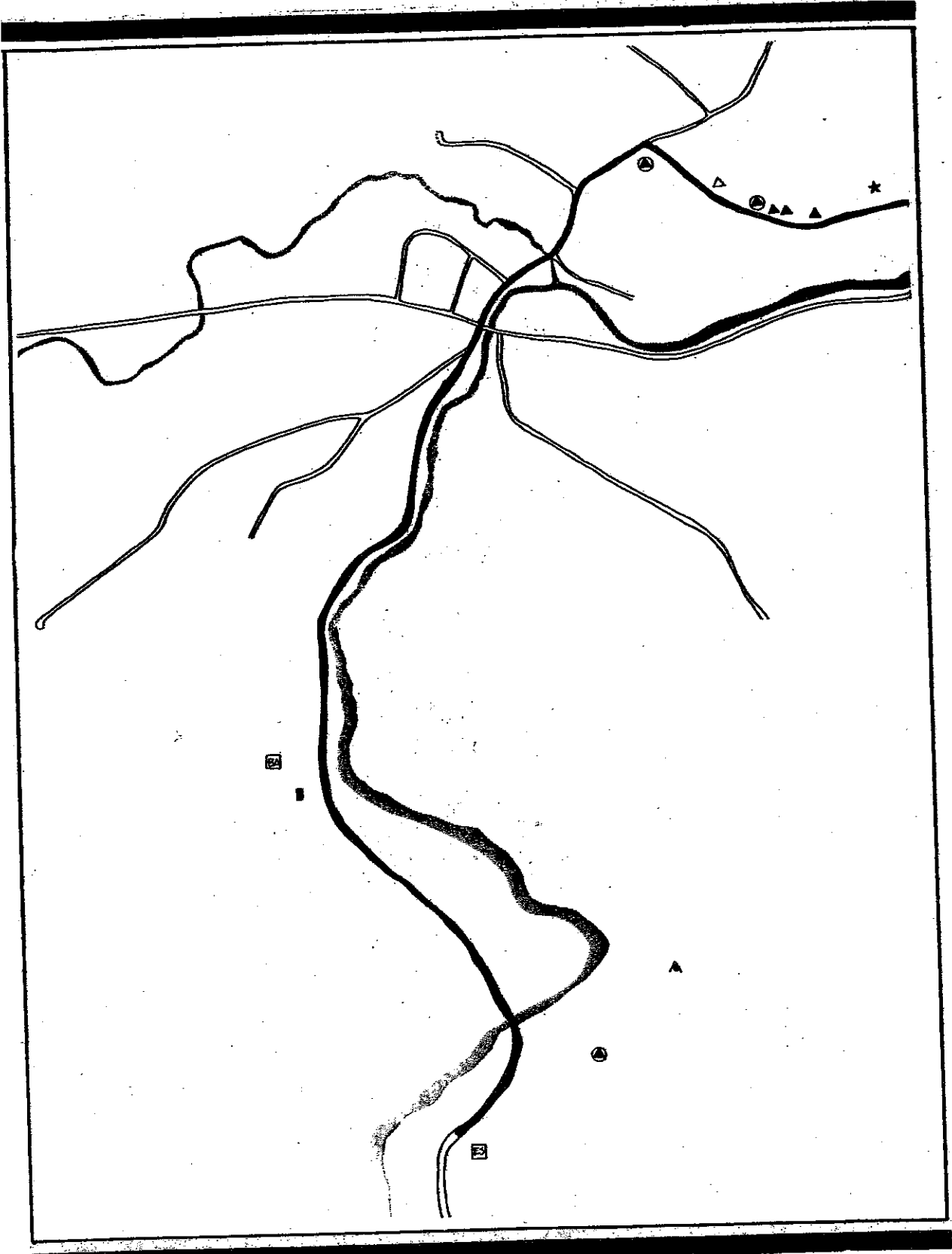
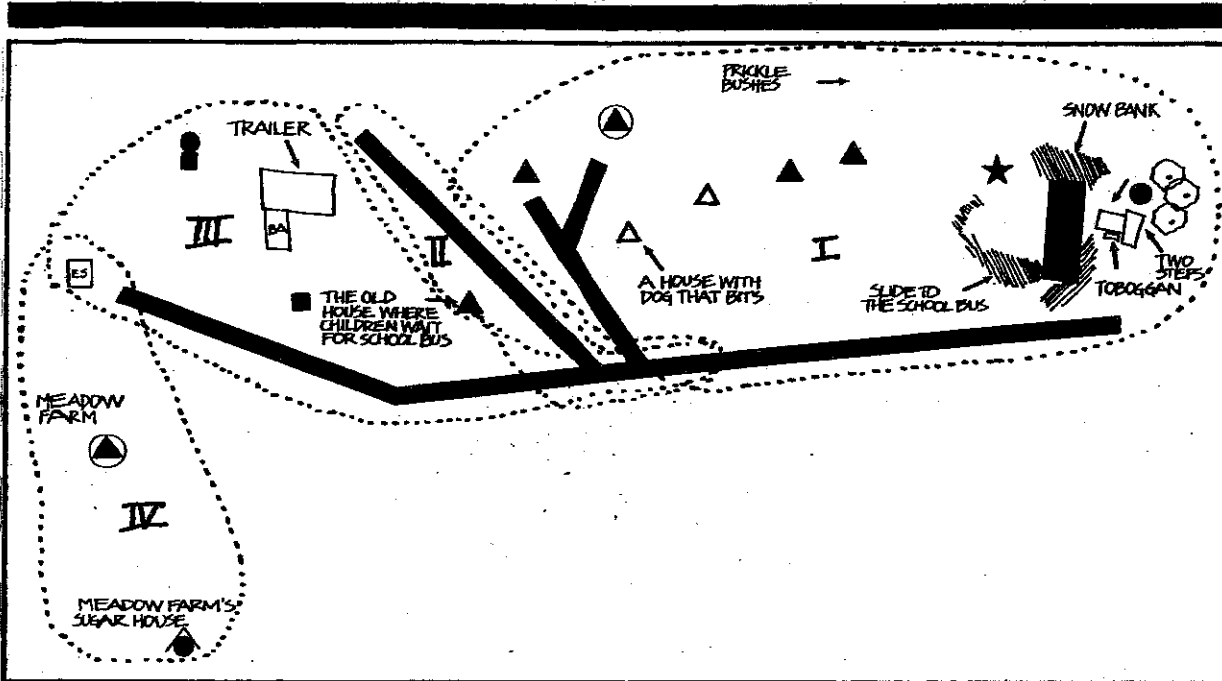


FIGURE 5-10a:ENID (5:11)-CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

I = 5 (positional)

II = 3 (spatial proximity)

III = 3 (spatial proximity)

IV = 4 (spatial order)

Between Clusters: 4 (spatial order)

∴ Integrated Score = $4 \left(\frac{5+3+3+4}{4} \right) = 15.2$

Extent of Area = 2

∴ Composite Score = $30 \cdot 4$

FIGURE 5-10b:ENID (5:11)-LANDSCAPE MODEL

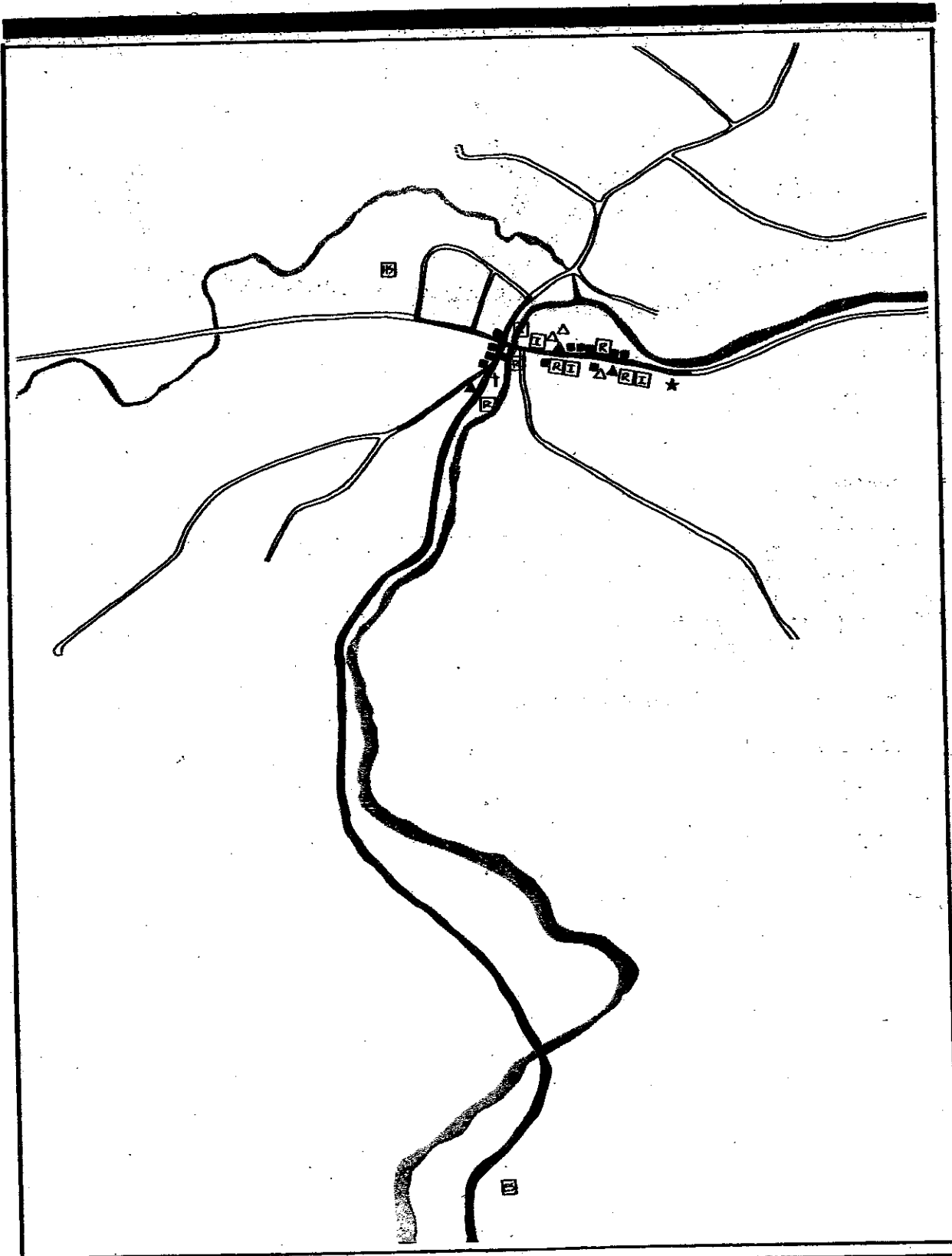
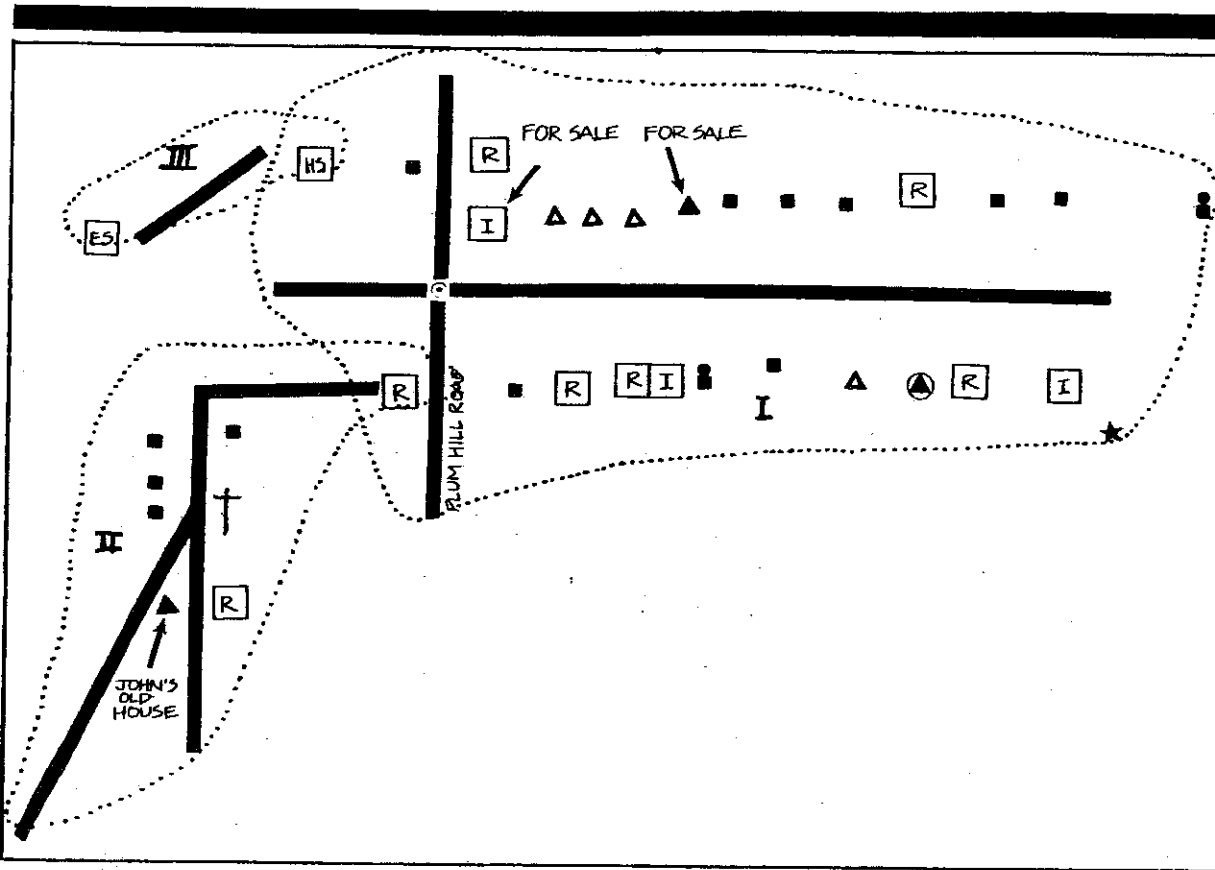


FIGURE 5-11a:MARTHA (8:7)-CONTENT ANALYSIS OF LANDSCAPE MODEL



Within Clusters:

- I = 5 (positional)
- II = 5 (positional)
- III = 2 (linked)

Between Clusters: 5

$$\therefore \text{Integrated Score} = 5 \frac{(5+5+2)}{3} = 20.0$$

Extent of Area = 3

\therefore Composite Score = 60.

FIGURE 5-11b: MARTHA (8:7)-LANDSCAPE MODEL

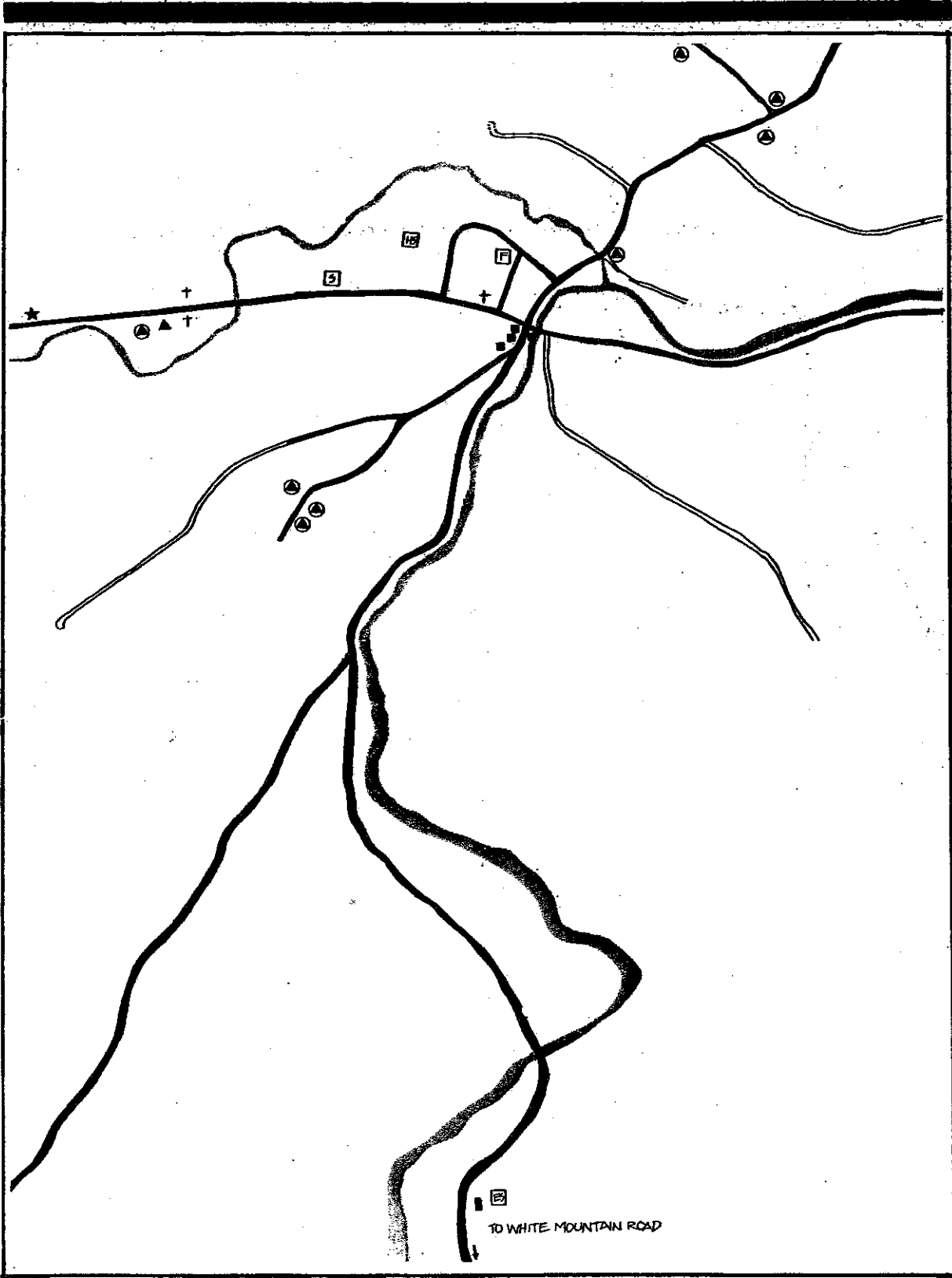


FIGURE 5-12a:CASEY (9:11)-CONTENT ANALYSIS OF LANDSCAPE MODEL

(This map is able to express only the central portion of the model.)

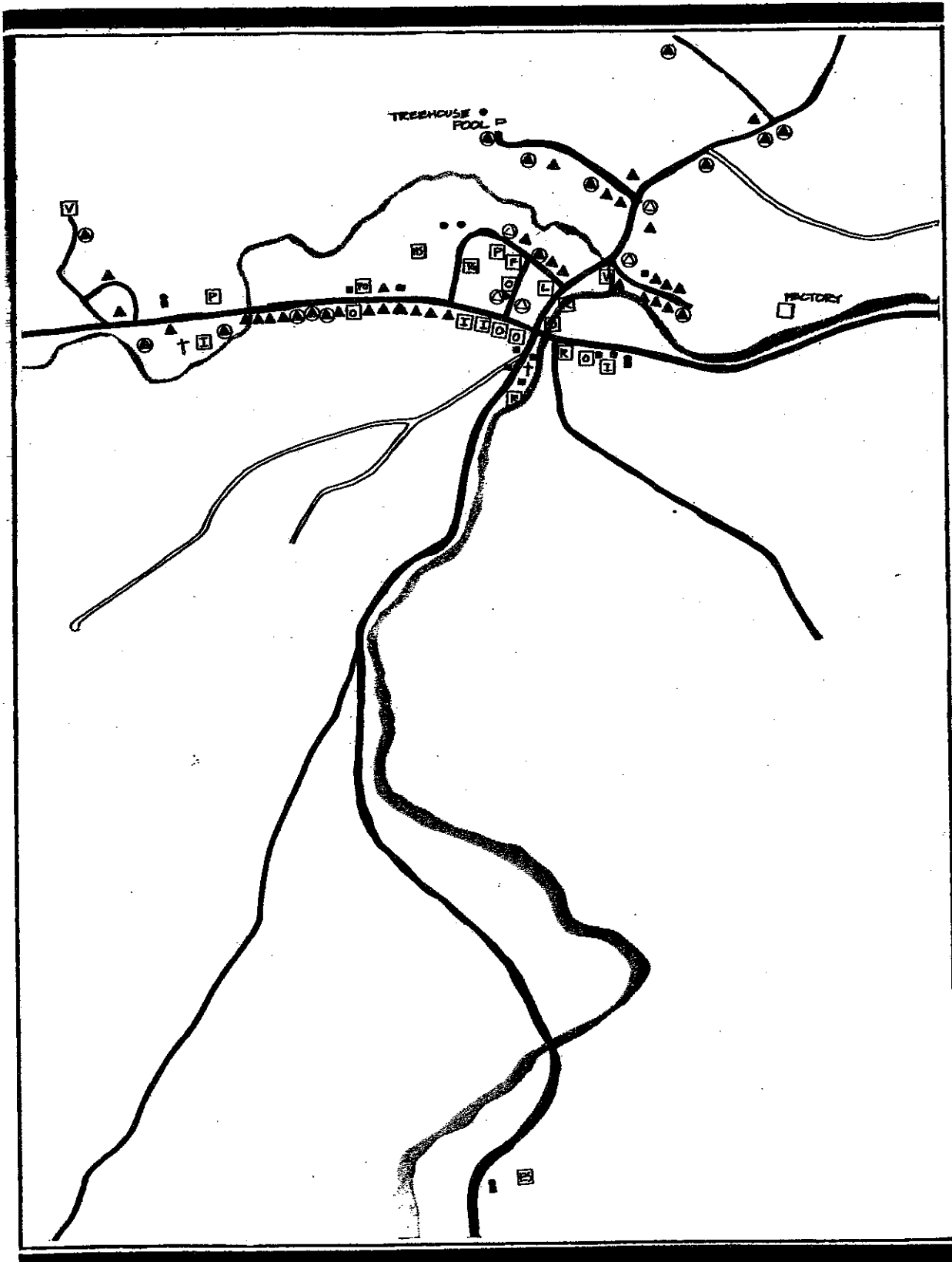
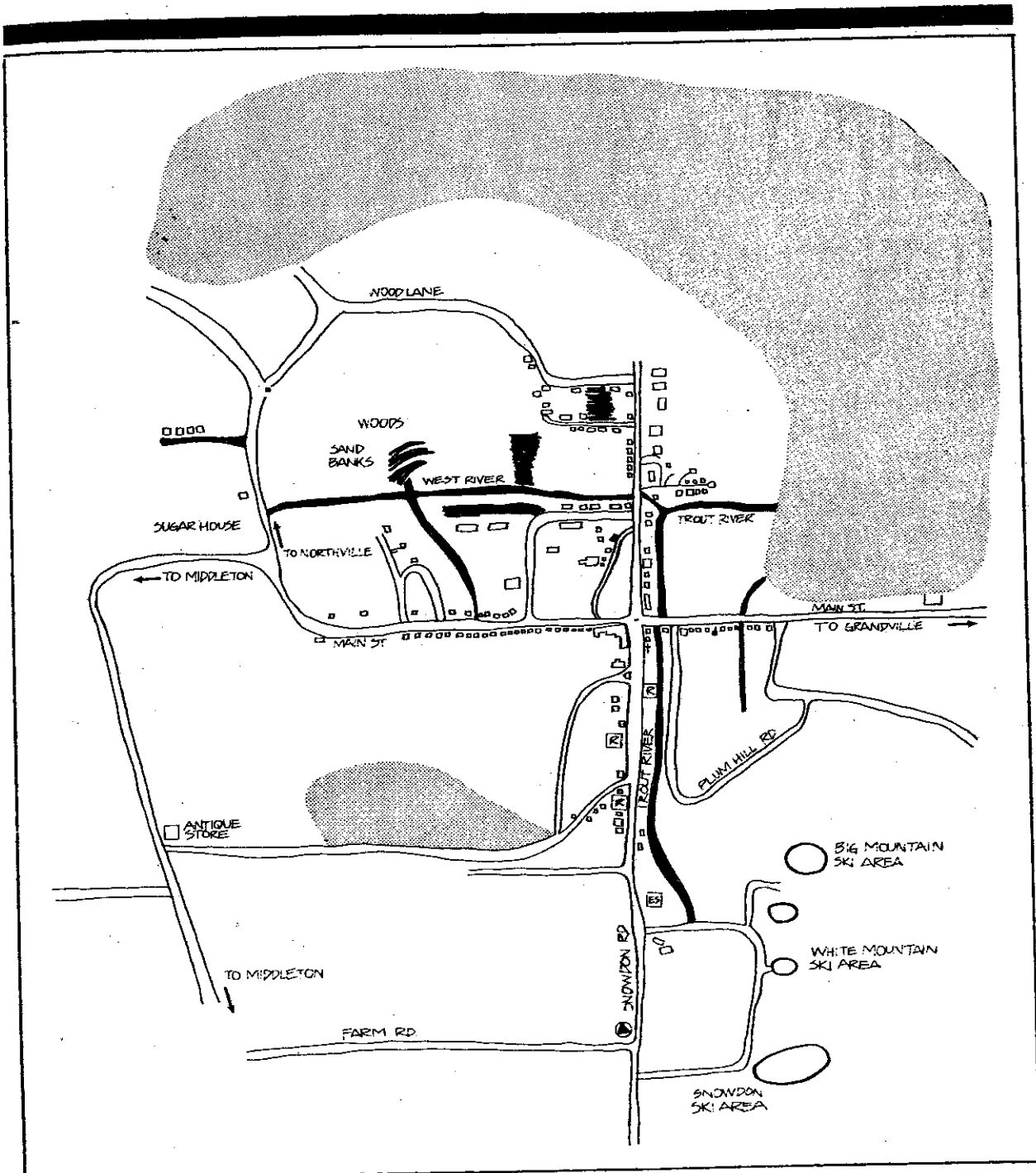


FIGURE 5-13a:ELLIOT (9:8)-CONTENT ANALYSIS OF LANDSCAPE MODEL
(This map is able to express only the central portion of the model.)



One Cluster only: level 5

∴ Integrated Score = $5 \times 5 = 25$

Extent of Area = 12

∴ Composite Score = 300

FIGURE 5-13b: ELLIOT (9:8) - LANDSCAPE MODEL

The Development of Children's Systems of Reference

From our review of literature Gary Moore and I hypothesized that there are three systems of reference which develop sequentially for a child (Hart and Moore, 1971 and Appendix A-2). We used the terms "egocentric," "fixed" and "coordinated" to describe these three systems. All of the children of this research were able to use a "fixed" system to some degree, that is they were able to think of places and of themselves in relationship to some independent fixed object or well-known route. Even the youngest children of this research, in their fourth year, were able to use their home as the base from which to recall the relative location of important objects and places. This method of using the home as a sole organizing pole for spatially representing the environment was common in children throughout the kindergarten and first grade level (that is, up to seven years of age). Thereafter, it was common for children to use a number of well-known points to base or "fix" the relative locations of other places and routes to. More common amongst older children, particularly those of fourth grade level (nine to ten years of age), was the use of some system of reference abstracted from the environment, commonly the structure of the road network. This system however was also found to degrees in children as young as first grade level (six to seven years), demonstrating that these are overlapping rather than discretely sequential categories; an older child may use any one, or all three systems of reference depending upon the demands of the particular environment and the extent of the child's familiarity with it.

The most frequently used abstract system was the crossroads in the center of town. As was discussed above, even one six year old child laid this cross down and located the buildings proximate to it (Map Figure 5-8). This is a quality of human-environment transaction which Kevin Lynch has termed "imageability." It is clearly most important in determining whether or not a young child is able to extract an abstract system of reference from the landscape or not (Lynch, 1960). Similarly, as Lynch demonstrated long ago with the highly imageable Common in downtown Boston, too great a reliance upon such a strong image can result in great distortion in a person's representation of the environment. Many children in Inavale knew the crossroads so well that they mapped them even though they were unable to correctly recall how the roads related to parts of the environment with which they were more intimately familiar. The result was maps with severe disjunctions or distortions.

Spatial Extent of Area Mapped

The correlation analysis suggests a high level of significance in the relationship of the extent of area a child maps in clusters with the age of that child ($p < .001$) and with the extent of that child's free range ($p < .001$), range with permission ($p < .01$) and range with others ($p < .001$). This is not surprising if one takes direct experience with environment to be important, for as was shown in the preceding chapter, there is a strong relationship between the age of a child and the extent of area travelled. It does seem surprising however, given the differences reported in Chapter IV between the spatial ranges of girls and boys, that the spatial extent of the girls' models is not significantly smaller than those of the boys (chi square $p < .25$, Table B-9). It appears that the girls know of as many places in

the town as do the boys, but are less able to spatially organize these places in a sophisticated manner.

The Content of the Landscape Models

It was noted in Appendix A-2 that it is wrong to assume that what a child maps in a free mapping exercise are the elements of the environment which are most important to him or her. For this reason, no detailed content analysis of the childrens' landscape model maps is presented here. However, because there appeared to be some gross differences according to age and sex, a content analysis was made of each map (Table 5-4). Only discrete elements such as houses, bridges and signs etc. were included in this simple analysis; continuous phenomena such as water, snow, grass, fields, trees and hills were necessarily excluded because of the difficulties of measuring and comparing their extent.

Boys constructed relatively more roads than girls (14.1% to 8.2%) though this was not true of the pre-school to first grade age group (12.6% to 13.2%). From my observations of childrens' toy play I suggest these differences reflect the greater amount of time spent by the older boys than by the older girls in building dirt roads for use with toy vehicles. Four, five and six year old girls play with toy cars considerably more than do the older girls. Perhaps this is the result of a growing awareness through the early school years, related to sex-role definition, that play with toy cars is considered more for boys than it is for girls. Certainly girls are just as interested in toy vehicles; in constructing people's homes they went to the same amount of trouble to find the correct colored vehicle and they even placed relatively more vehicles alongside these houses than did the boys (15.4% to 18.9%). It is probably also the influence of sex-role definition which led to there being a higher proportion of factories on the boys maps than on the girls (2.6% to 1.0%) though this might equally be explained by the much greater freedom boys have to explore these places.

A greater percentage of places on the girls' maps than on the boys' maps were the homes of adults (10.5% to 7.7%) and the homes of high school aged children (1.5% to 1.0%). This accords with my observations of the greater frequency of visiting to adults made by girls (Chapter VI). All of these data combine to suggest that adults and older children are relatively more important in the lives of girls than they are in the lives of boys.

The greatly restricted spatial ranges of young girls is reflected in the very low number of childrens' homes they were able to represent in contrast to the boys (not recorded in Table 5-4). The ten boys of pre-school kindergarten and first grade represented the homes of 22 boys of other grades whereas the nine girls of this age level represented the homes of only six girls of other grade levels. In the third and fourth grade level, the pattern is reversed with the 11 girls representing 36 homes of children of other grade levels and the 11 boys representing the homes of 29 boys of other grade levels.

A markedly greater proportion of places in the older girls and boys models were commercial (i.e., various stores) than in the models of the two younger age groups of children (19.8% in c.f. to 9.2% and 8.5%).

TABLE 5-4

LANDSCAPE MODELS--SUMMARY OF CONTENT ANALYSIS (1)

	Grades P-1		Grade 2		Grades 3-4		Total Grades P-4					
	Boys	Girls Total	Boys	Girls Total	Boys	Girls Total	Boys	Girls Total				
Bridges	0	1.05	1.22	.56	1.95	1.56	1.79	1.35	1.34	1.35		
Roads	12.58	13.23	14.42	9.10	14.78	6.83	10.59	14.10	8.20	11.37		
Vehicles	21.74	19.02	20.85	28.56	27.30	28.18	5.00	14.66	10.07	15.36	18.87	16.98
Commercial Places	6.86	10.76	8.54	9.51	8.52	9.17	20.22	19.35	19.75	14.31	15.57	14.89
Offices (business)	4.57	0.82	3.07	3.98	1.70	3.19	6.74	5.46	6.07	5.46	3.91	4.75
Hotels/Restaurants	4.00	8.27	5.80	1.52	2.83	1.99	9.35	7.82	8.53	5.78	6.73	6.22
Factories, etc.	3.42	0.82	2.39	0.92	1.13	0.99	3.47	0.97	2.15	2.63	0.97	1.86
Signs/Lights	2.85	0	1.69	3.06	1.13	2.38	1.52	1.37	1.43	2.31	1.09	1.74
Houses (Elementary)	20.59	17.37	19.47	15.66	21.05	17.54	14.35	15.64	15.01	16.12	16.91	16.48
Houses (High School)	0	0.82	0.33	1.84	2.83	2.19	0.86	1.18	1.02	1.05	1.47	1.24
Houses (Adult)	6.86	6.61	6.83	5.52	10.24	7.18	9.35	11.73	10.59	7.68	10.54	9.00
Gas Stations	1.13	0.82	1.01	3.38	1.70	2.79	4.56	3.31	3.90	3.57	2.57	3.10
High School	2.85	4.96	3.75	2.46	1.13	1.99	1.73	1.16	1.43	2.20	1.72	1.97
Churches	4.57	5.78	5.11	4.60	3.98	4.37	4.34	3.52	3.90	4.52	3.91	4.23
Cemetaries	0	0	0	0.30	0	0.19	0.21	0.58	0.41	0.27	0.36	0.28
Farms	2.85	4.12	3.40	1.22	2.83	1.78	0.53	2.92	1.84	1.26	3.05	2.09
Miscellaneous	5.14	4.96	5.11	1.84	3.98	2.59	1.08	1.95	1.54	2.10	2.81	2.43
Number of Landscape Models	10	9	19	13	9	22	11	11	22	34	29	63

1 The frequency with which each category of elements was included in the Landscape Models is expressed as a percentage of the total number of elements modelled by the children. Only discrete elements are included in this analysis; this excludes continuous phenomena such as water, snow, grass, fields, trees and hills.

adults. They looked at the type and color of the car in the driveway (particularly the boys) and the color of the house. Even during the landscape modelling most complaints were over the limited range of colors of blocks available for building houses: "brownish yellow" and "white with green trim" were even used to describe houses for which the children had no name for the owner.

Beyond the Experienced Horizon

The children did not seem to have much knowledge of, or interest in the world well beyond that which is experienced directly by them. Any places other than Grandville and Middleton are equally as far or near the children as New York, Boston, or Washington. These places lie in the "elsewhere schema" referred to by Howe (1931) and suggested by the writings of Lee (1963, Appendix A-2). The only spatial distinction the children seem to make is one based on transport: California is further away than Boston because you fly there. Combined with this lack of knowledge and interest in the relative location of places I found a complete lack of differentiation between towns, cities, states and countries: all were places "out there," though sometimes, especially when children had visited a place, they would have some idea of which direction it was; usually a place lay in the direction that their car left town.

Place Naming

The place names used by children of seven years of age and younger are largely functional descriptions of the environment such as Enid's "the house with the dog that bites" and the "snow slide to the school bus" (Map Figure 5-10). Similarly, when describing streets or regions the children use the names of children they play with such as "on Peter Scott's hill" or "it's down Joe Douglas' street way." When talking with each other children most commonly use such descriptors throughout their elementary school lives. When they use the more general descriptors in talking with adults, such as Plum Hill and North Hill, they frequently get mixed up. The models produced by the children of these ages strongly suggest that the landscape beyond their home and immediate vicinity does not consist of a stable set of places with enduring functions, but of events which occur in certain places with no generalizations as to the common function of those places such as "the place where the fair is" as Enid describes the town's recreation field. As these children move through what Piaget calls the "concrete operational period," they become more and more able to associate these events with each other, to fix their experiences in particular places and to generalize about the functions of those places. Being able to apply a name to these places is no doubt a crucial development in this sequence of knowing and important phenomena for any person wishing to further research the development of children's place cognition. However, children frequently become very confused through the use of these names before they have grasped the generalizations as with Beckie who confidently described the little island at the bottom of Greenlawns Hill Road as a "turnpike" because it's a road that cars turn around on, and Danny who thinks New York City, and no doubt all cities, look like the "Food City Restaurant." An even greater possibility of confusion lies with

places which stand as symbols, such as the War Memorial on the small library front lawn where Johnny was convinced a major war had been fought between "the Germans and the Americans."

It is the importance of language in children's place learning which most satisfactorily explains the great superiority of the landscape models produced by Henry (Map Figure 8-10) and by Davy (Map Figure 9-6). Both boys have fathers who purposefully make a practice of talking to their sons extensively wherever they are travelling. While this research has supported Lee's contention then that young children's ability to mentally represent the geographic environment largely reflects their directly (bodily) experienced environment, I question now whether all vehicular experiences are equally alienating (Lee, 1963). It may be that the school bus with its high windows, crowded and socially complex conditions may be a qualitatively different learning experience for a six or seven year old than is the front seat of a parent's car or the back of a truck.

Place Hierarchies and Regions

Children throughout all of the elementary school grade levels were remarkably confused about the geographic hierarchies of city, state and nation. This was particularly true of children younger than eight years of age who, through having heard the name of the state they live in so many times, had commonly concluded that it was an important nearby town. This is understandable, for it is questionable that children of this age have mastered the concept of class inclusion. For children of ten years of age and older to not know whether or not their own state and the neighboring states are different regions or include each other can only be explained by a lack of information. Geographic education is not given much emphasis in American elementary schools; there is very little useful geographic information in the popular media and there are very few maps or atlases available in the average home.

It is the confusion over place hierarchies together with young children's inability to estimate relative distance when travelling by vehicles which results in such statements as the one by Laurie (8:0): "just after we left Boston we stopped in South Carolina" and "Norwich is pretty close to Connecticut or Casey (10:2) who thinks Texas has countries and states in it. Responses to my simple questions on this subject to the subsample of children were so confused that I realized the question requires a much more careful research design (1).

One third grade child felt such a strong desire to represent a very distant area that she invented a new cartographic device for compressing distances. She divided the model into two halves--Inavale and her grand-

1 I believe this question is being tackled in a current Ph.D. thesis by Pichè (1977) in the Department of Geography at the University of London.

parents home area in a southern state--and joined them with a road which she sketched as a knot. She chose to do this because she insisted she was much happier in her grandparents town than in Inavale. It was my impression that any of the children could have done the same were it not for the methodology which required the child to begin with their home and to show only those places which they knew the location of.

CHAPTER VI. Place Values and Feelings

Childhood flows from so many springs (sources) that it would be as futile to try to construct its geography as to write its history. . . . One analyzes childhood better with poems than memories, better with reveries than with facts (Bachelard, 1962, pp. 112 and 124-125).

It is a popular notion that poetry and good literature more accurately capture childhood experience than does behavioral science. In some respects this is true. Unfortunately, while this belief has left us with descriptions of children's experiential engagement with the environment which are both beautiful and voluminous, they are at the same time narrow. The writers, almost exclusively from rich, highly-educated, rural backgrounds, have presented us over the past 200 years with a most romantic image of children's empathic engagement with the natural world. Behavioral scientists by comparison have largely retreated from saying anything about children's feelings for the everyday world of places and things, having limited themselves to the materials of experiments, tests and simulations. The combined result is that we have a very warped view of children's feelings for their environment.

Modestly, this chapter presents children's responses to simple questions on their evaluations of, and their feelings for places. Bachelard is of course correct in saying that many aspects of experience are removed from scientific analysis. "The Family Studies" (Chapters VIII and IX) discusses the nature of children's place feelings in greater depth, but even there the discussion fails to probe the subjective workings of childhood experience through the imagination.

You, the reader, must work doubly hard to contrast the statements made here with your own childhood. One's own memory is the best source available. The opening quotations from Bachelard's "The Poetics of Reverie" includes a basic ambiguity: poems, also, if they are to say anything valid about childhood experience, must in large part depend upon memory, even though, as he stresses elsewhere, memory does not come pure "in a frame," but is much elaborated by the imagination. The consensual documentation of places important to children which are presented below are not meant to suggest that there is any one fixed set of such places for any child. They do, however, reveal some of the types of places important in children's lives that as adults we forget. It is not "futile" to try to reconstruct the "geography of childhood," it is simply necessary to recognize that only a partial description can ever be achieved.

Procedures

The investigation of people's values and feelings for places presents greater problems than the two sub-areas of inquiry described above (Chapters IV and V). It is perhaps this which explains in large part why

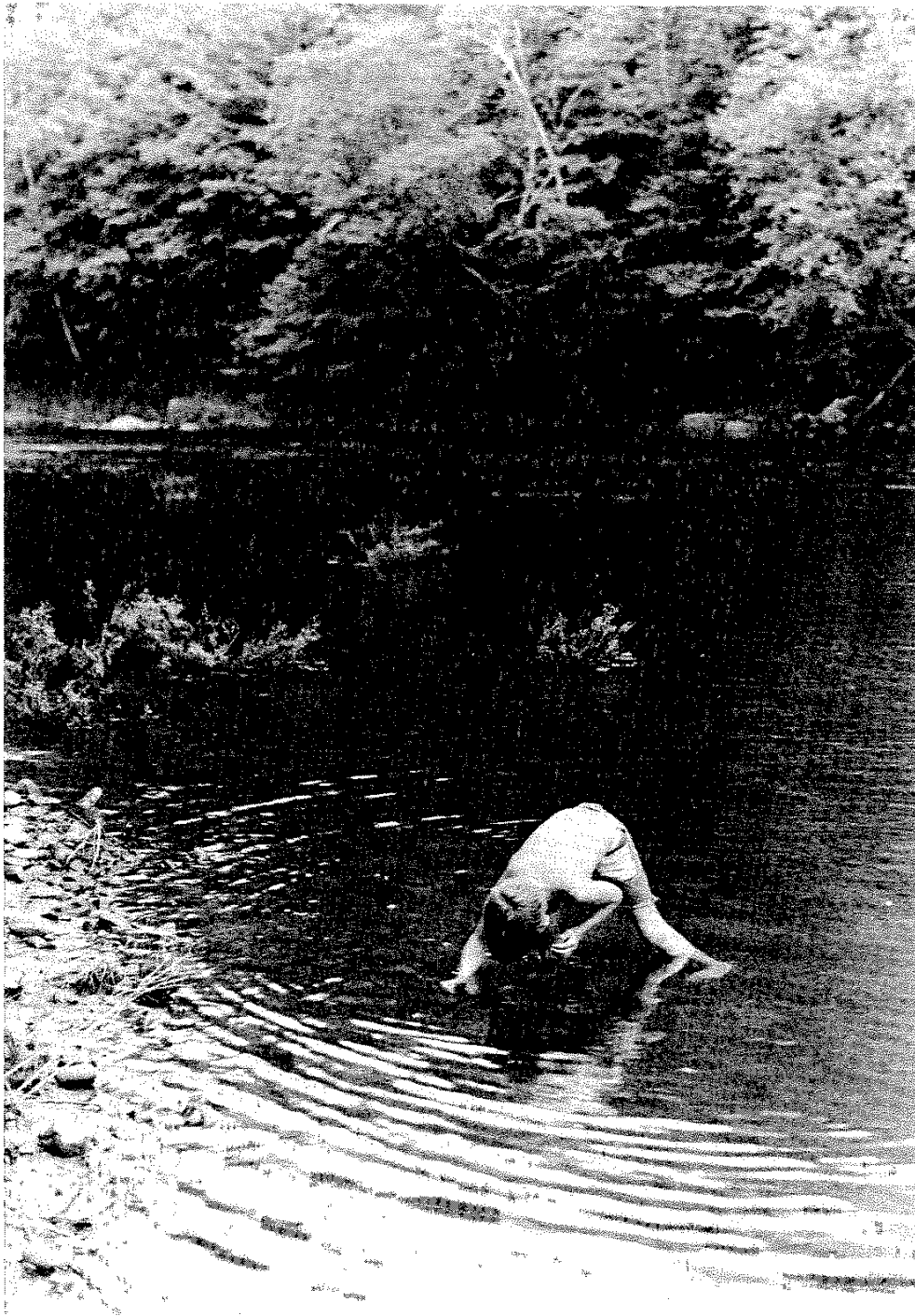


PLATE VII

Emile at his favorite fishing place catching fish by hand.

there has been so little research to draw from.

Many objective measures of children's feelings for places were considered, for I desired data which would enable comparison of children by age and by sex. Unfortunately, most of the techniques used in the past are forced-choice tests which assume an equal facility with language among the population, something which is not true of children ranging from four to 11 years of age. Furthermore, no standardized tests (in which response to a common stimulus is desired) were suitable, because I anticipated that both the quantity and quality of places experienced by children would vary greatly between the ages of four and 11. For this reason a variety of measures were used, each of which recognizes the uniqueness of children's experience of place. Some of the measures were designed to provide aggregate data for comparative purposes, by age and by sex. Others were developed to provide a fuller picture of the place experiences of the sample children only.

Place Feelings (Structured Interview)

Purpose:

The purpose of the interview was to obtain a gross aggregate picture of the dynamic forces which influence children's environmental behavior: children's attractions to and avoidances of places. This place feeling inquiry was designed to be compared directly with data generated from the spatial activity and place-use procedures.

Data Collection:

Each child in the total population was interviewed during school hours. I told the children that I was trying to find out what they felt about different places in and around Inavale. From previous discussions I knew that they would fully understand and respond to questions on the places they liked, disliked, feared, and found dangerous. A number of children introduced a fifth category, strange or weird places, which I added to the interview for all children. The following questions were asked:

1. Tell me the 10 places you like the most, in and around Inavale. (The list was initially limited to 10 places, in order to focus the children's attention upon their most favorite places. If a child expressed interest in continuing the list of places after 10 had been named, the places were all noted on aerial photographs of the town, and, by a process of gradual elimination, the number of places was reduced to the 10 most favorite places. This gave me a primary list to use for comparative purposes.)

2. Tell me all of those places you dislike in and around Inavale

3. Tell me all of those places you think are dangerous in and around Inavale.

4. Tell me all of those places you think are frightening in and around Inavale.

After each child completed the interviews, we colored the places in on an aerial photograph; with a separate point used for each place mentioned. This procedure enabled me to obtain specific information about location either by finding the place with the child on the photograph or, if it was too small to be identified, by obtaining a verbal description.

Data Analysis:

In view of the relatively large number of children participating in this interview, it was possible to break the analysis down by individual grade levels. No satisfactory, straightforward method was identified from the ethnolinguistic literature for sorting the children's place preferences into categories. I therefore extracted place categories from the children's responses, using simple categories that could be compared with the place use data (Chapter VII). All of the data were analyzed simply and are expressed in percentage frequency tables.

Children's ideas about dangerous places, and their fears, readily fall into a small set of categories for comparison by age, by sex, and with their parents' own notions on this subject.

Problems with the Method:

As anticipated, the structured interviews failed to offer a rich, detailed picture of children's place feelings. Since I interviewed the children away from their home environment, they de-emphasized places that they could not explain without showing me because they felt I would not understand why this place or that place was so important to them; a problem compounded by my being an adult. Also, because the interview relied solely on language, I obtained a more consensual expression of place feelings than would otherwise have been the case. There was a tendency to identify places that were part of the common stock of valued places rather than unique, personally important places, and to describe those places as they were socially known rather than personally felt.

I observed that dangerous and scary places were identified with much less of a struggle, but again there was some emphasis upon those places defined socially, at the expense of those experienced uniquely by the individual child. These weaknesses were brought out through comparison with the following method.

Place Expeditions

Purpose:

The purpose was the same as with the structured interview above. Because of the dependence of the interviews on the verbal facility of

each child, and because the interviews were to be conducted at the elementary school, some considerable distance from the children's homes, I required a more valid method to use with the sample population of children, a method that would bring me closer to their personal feelings.

Data Collection:

I asked each child to take me to all of the places important to him or her. This successfully avoided the problem of depending entirely upon children's verbal expression of feelings for a place, because I asked them not only to tell me, but to show me how they used or felt about a place. Because the time involved in traveling to all of a child's important places was great, I worked with the sub-sample of children only. Since the expeditions took place during the summer vacation, the results can be considered valid for that season only.

In order to direct each child's attention to the exploration and discussion of place on these expeditions, I gave them a polaroid camera with which to take pictures of their 10 most favorite places. I first asked each child to sit with me on his or her door stoop and think what these 10 most valued places might be. This gave a little order to our walk, though there were of course always more than 10 places. The expeditions took between one and three days per child, lasting a total of six weeks. Our trips were limited to places within the boundary of the township, though I made note of the more distant places they mentioned.

Upon arrival at each of the favorite places, the child was encouraged to talk freely and demonstrate his or her interest in and use of the place. In addition, the following sequence of questions, beginning with the general and becoming more specific, was asked at each place in a casual manner:

1. Tell me about this place.
2. How do you usually feel when you are here?
3. What do you like about it here?
4. Why do you usually come to this place?
5. Do you come with anyone else to this place? Who?

The responses to these questions were written in my log. The specific places were the orienting focii for the trip. Of greater value to me, in gaining insight into children's place experience, was that I was alongside them as they moved through the environment. I began to learn something about how they contacted the environment. Through empathy, the fluid transaction between a child's plans and the environment's attractions was opened up to me as we meandered through their physical world.

I chose not to carry a tape recorder for two reasons. First, I felt that because we already had one polaroid camera and one 35mm camera, a tape recorder might make the children a little self-conscious. Also, I felt (quite realistically) that I would never find the time to transcribe the information. Instead, I carried my log book and whenever the opportunity arose, I sat down and completed it. The children understood the

reason for this, but it frustrated them to have me stop to write on such an exciting trip. It also meant that my questions to them became a little more formal than had we been walking along recording our conversation. I resorted to making shorthand notes and elaborating them at the end of the day in my home. I strongly recommend that a good, but lightweight and unobtrusive, tape recorder be carried by anyone attempting this procedure in the future so that specific issues may be traced and clarified should the need arise.

Upon completion of the photographic expedition, the photographs were stuck on to cards and each child was asked to order them from the most favorite to least favorite. Any confusions or gaps in my understanding that had developed during the expedition were discussed with the child while viewing the photographs. Also at this time, the following questions were posed:

1. Are there any places apart from your house where you feel like you really belong or feel very comfortable?
2. Which places do you most like to be when you are alone?
3. What are your favorite places outside of Inavale? Tell me about them, please.
4. If you won a competition and could live anywhere in the world, where would you live? Can you tell me what this place looks like?

The children were asked not to tell brothers, sisters or friends what photographs had been taken because I was only interested in their own feelings. This was necessary to avoid a tendency noted during my first trips to take me to some places that would impress me because they were "better" places than their brothers or sisters would show me.

Data Analysis:

The place expedition data were sorted into frequency tables using the same categories as the structured interview data to enable comparison of the two methods.

Parental Questionnaire

Children were not found to be very sophisticated or interested in generalizing their place feelings. For this reason, the above procedures were supplemented by information from the parents of the sample children. A section of the parental questionnaire was devoted to questions of each child's experience of places as perceived by his or her parents. Using a secondary source of information is not ideal, but the child's parents, though unaware of much of their children's activities, are the only source of information on the history of a child's relationship to places. They also seemed to truly enjoy interpreting their children's feelings and were frequently the source of valuable insights.

Findings

Place Preference

The Two Methods Compared

Children's "favorite places" were determined through two methods: interviews conducted in a traditional manner in the school, and "place expeditions" led by the children with their own home as the starting point. As anticipated, these two methods produced different results, which help point to the strengths and limitations of each of them.

All of the children seemed to enjoy the opportunity to describe or lead me to their favorite places. A few of the younger children could not think of as many as 10 places during the interviews in school. In contrast, I was never faced with this problem on the place-expedition, which suggests that, either the interviews were relatively boring or the children found it difficult to return mentally to their everyday out-of-school environment.

The detailed results of the two methods are compared in a series of tables (Appendix B). Before considering these results in detail, however, it is necessary to make some general comparisons of the data from the two methods (Table 6-1).

The children's selections of places from favorite place interviews and expeditions were diverse. Places were not only selected because of their value for play. Some places were selected because a best friend lived there, others because of things that can be bought there and a few others because of their appearance. When children simply named someone's house, I checked to discover if there was any particular quality of the place which they valued. Usually they quickly explained that it was a favorite place because they liked the person living there. I considered changing the interview in order to ask them about each of these types of places separately, but instead I decided to keep the question open and to separate the responses into four major categories: "land-use," "commercial," "social," and "aesthetic." This enabled me to make some broad comparisons according to age and sex. In summary form, these broad categories are:

1. Land-use: places valued because of the uses children put them to in their play.
2. Social: places valued because some individual lives or works there or because some particular social event occurs there, such as Brownie meetings or the church.
3. Commercial: places valued because of what can be bought or otherwise obtained there.
4. Aesthetic: places valued because of what they look or feel like.



PLATE VIII

"All of the children enjoyed the opportunity to describe or lead me to their favorite places."

Occasionally a place could have been entered in more than one category. For example, "playing cars in front of John's house; it looks lovely there," could be entered under land-use, social, and aesthetic. Because a land-use was given in this case, it would be noted under the land-use category. If no mention of the land-use had been made, it would have been located under aesthetic. If no place qualities other than "John's house" had been mentioned, it would have been located under the social category. The weakness with this is clear to see: it may be simply a question of verbal facility that would cause one child to give more specific information than another. At first sight this may be thought to explain why younger children mentioned relatively fewer land-use places, but this pattern was repeated in the place-expeditions where verbal facility was not required. Also, because each child when interviewed gave some land-use places along with social and commercial places, there seemed to be no general problem in specifying places.

As anticipated, the children mention more land-use places on the place-expeditions which began from their own home (66 percent), than when interviewed at school (46 percent). Balancing that difference, the children mention more than twice the number of "social" places in the interview than they do on the place-expeditions. This is largely accounted for by the relatively small number (14) of older children (i.e., grades four through seven) who led me to such places. Very few "aesthetic" places were selected by the children as preferred places in either of the two methods, but it is noteworthy that considerably fewer such places were mentioned during the place-expeditions than in the interviews. I believe this to be a reflection of the less personal, more learnt, quality of visual aesthetic appreciation--to be discussed below. In the place expeditions the children seemed much more able to express their personal feelings for places and things.

The following detailed breakdown of the results further suggests that the two methods differentially influence the likelihood of certain specific types of places being included in the children's sets of preferred places. The conclusions from these differences are that children on place expeditions are more likely to think of their highly valued land-uses and less likely to focus on people's homes than when they are interviewed in a school setting. This is a fairly obvious conclusion, although from existing psychological literature on interviewing, one might easily be led to conclude that the setting of the interview has no bearing whatsoever on the results.

Keeping the somewhat different results of these two methods in mind, it is now possible to compare the place preferences of younger and older children, and of girls and boys.

Age- and Sex-Related Differences in Place Preferences

In order to extract some pattern from Table 6-1 of how place preference varies with age, it is most valid to compare grades K through three with grades four through seven for these two groupings each have approxi-

TABLE 6-1

PLACE PREFERENCE INTERVIEWS AND EXPEDITIONS:
SUMMARY OF MAJOR CATEGORIES OF PLACE PREFERENCE*

	GRADES K-3			GRADES 4-7			TOTAL K-7		
	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL	BOYS	GIRLS	TOTAL
<u>LAND-USE</u>									
INTERVIEW	86	49	135	58	89	147	144	138	282
% OF TOTAL	46.48	39.20	43.54	43.28	52.35	48.35	45.14	46.78	45.90
EXPEDITION	57	22	79	36	45	81	93	67	160
% OF TOTAL	68.67	50.00	62.20	66.66	71.42	69.23	67.88	62.62	65.50
<u>COMMERCIAL</u>									
INTERVIEW	33	26	59	26	22	48	59	48	107
% OF TOTAL	17.83	20.80	19.03	19.40	12.94	15.78	18.50	16.27	17.40
EXPEDITION	10	12	22	10	10	20	20	22	42
% OF TOTAL	12.04	27.27	17.32	18.51	15.87	17.09	14.60	20.56	17.20
<u>SOCIAL</u>									
INTERVIEW	63	49	112	46	51	97	109	100	209
% OF TOTAL	34.05	39.20	36.12	34.32	30.00	31.90	34.17	33.90	34.00
EXPEDITION	16	10	26	6	8	14	22	18	40
% OF TOTAL	19.27	22.72	20.47	11.11	12.69	11.96	16.06	16.82	16.30
<u>AESTHETIC</u>									
INTERVIEW	3	1	4	4	8	12	7	9	16
% OF TOTAL	1.62	.80	1.29	2.98	4.70	3.94	2.19	3.05	2.60
EXPEDITION	0	0	0	2	0	2	2	0	2
% OF TOTAL	0	0	0	3.70	0	1.70	1.46	0	.80
<u>TOTAL (100%)</u>									
INTERVIEW	185	125	310	134	170	304	319	295	614
EXPEDITION	83	44	127	54	63	117	137	107	244
<u>N</u>									
INTERVIEW	21	12	33	15	17	32	36	29	65
EXPEDITION	9	5	14	6	9	15	15	14	29

* See Appendix B for a detailed table of Place Preference Interviews and Expeditions.

mately the same total number of children who participated in the interviews (N = 33 and 32, respectively). Unfortunately, a markedly smaller number of girls in the younger age group participated in the interview than did boys. Similarly, there are somewhat fewer girls than boys in the younger age group who led me on place-expeditions, although the total number of girls participating in this activity is similar to the number of boys (N = 14 and 15, respectively). For these reasons, only the most gross differences between the two sexes are highlighted in the following discussion.

Considering the younger and older age groups of children together, there are no marked differences between the two sexes in the percentage of preferred places which fall under any one of the four categories of place preference--land-use, commercial, social and aesthetic (Table 6-1). On the other hand, in contrasting the younger age group (grades K through three) with the older age group (grades four through seven) there are some interesting, though not extreme, differences (Table 6-1). The older children selected a slightly higher percentage of land-use type places (48.4 percent to 43.6 percent and 69.2 percent to 62.2 percent) and "aesthetic" type place (3.9 percent to 1.3 percent and 1.7 percent to 0 percent) (1). Balancing that, the youngest children selected more places under the "social" category in both methods (36.1 percent to 31.9 percent and 20.5 percent to 12 percent), and, in the place interviews, more places in the "commercial" category (19 percent to 15.8 percent). This increase in the percentage of "land-use" type places and concomitant drop in the percentage of "social places" is the result of a dramatic difference in the kinds of places preferred by the two age groups of girls. The percentage of "land-use" type places which the older group of girls state are their most favored is 52.4 percent compared to the 39.2 percent by the younger girls. This trend is even stronger in the place expedition data (71.4 percent to 50 percent). The high value put upon these land-use places perhaps reflects the fewer opportunities older girls have to travel across town on their own to the "social" and "commercial" type places in comparison to their male peers. A better understanding of this and other possible interpretations comes from the detailed tables of this data (Appendix B).

Land-Use Place Preferences

Easily the most frequently stated preferred place is the ball-field (42, 11)(2) in the town center. This is true for both boys and girls of third grade and older; the only notable sex difference is in the

1 The percentages in parentheses refer to the "interview" and "place-expedition" data, respectively. Both are taken from Table 6-1.

2 Throughout this section, numbers in parentheses refer to the frequency of occurrence of the specified place using the interview and place-expedition method, respectively (see Table in Appendix B).

third grade, in which a greater preponderance of boys favor this place. According to the place expedition survey nine out of the 10 boys favor it compared to only two girls out of 11. A closer look at the interview data however reveals that for girls of over fourth grade level, the ballfield is an equally popular place. They value it not only for playing the game but also for watching it. As will be discussed under "Place-Use" (Chapter VII), the functions of the ballfield transcend its name. It serves almost as a town common. The children know it to be the busiest center of child-activity. It is this which explains its great popularity over the children's own home ballfields (13, 8). The ballfield is also known as the place where the annual fair is held, an event the younger children remember year round and relive frequently in their conversations and dirt play. The ballfield as Fairground (0, 4) was visited during four of the place-expeditions because the children had seen one or two likely looking trucks come through town and therefore insisted we visit this most important site.

Rivers are at the top of the list of places visited on the place-expeditions (20) and are third in the frequency of places selected during the interviews (27). Girls and boys, young and old, enjoy the rivers for fishing, dabbling, and occasionally for swimming. Lakes (20, 9) also score high on the list for younger and older boys and girls, and the choice of a swimming pool (3, 2) by a few children is a further indication of the importance of swimming opportunities to children.

The next most important category from both methods, "forts and houses," is most surprising in the light of previous studies of children's use of the environment. The importance of these child-built places, to be discussed under "Place-Use" (Chapter VII), is made particularly clear by these data. One reason most studies have not noticed this phenomenon is that they have used the observational survey approach which would prevent them from discovering children's use of wooded and other hidden areas (Appendix A). But the explanation may also be that the majority of such studies have been made in suburban areas or new towns, and the remaining ones in cities. Rural areas offer more opportunity for building due to the availability of both unused space and loose parts. It may be that cities also offer these qualities, but we must await the comparative in-depth study of children's use and experience of environments before we can say this with any certainty. One particularly interesting aspect of these data, revealed in both methods, is that while there are somewhat more boys in the younger age group who choose these child-built places, there is a much greater number of older girls who favor these places compared to their male peers. The girls usually refer to their places as "houses." The most obvious interpretation of the greater value of the "houses" to the older girls in comparison to the older boys, is because of their greater utility in their role-playing play.

It is interesting that woods (17, 5) rank relatively higher on the aggregate assessment of favorite places from the interviews than on the totals compiled from the expeditions. This may be related to my observation that, while children have a general fascination with woods and talk about them often, they rarely use them (Table B-15(A), in Appendix B-1). This is especially true of the younger children who never venture into the woods more than a few trees deep. Even on the place expeditions, I noticed a reticence

to enter woods on the part of some children who claim them as a favorite place. Eight of the choices of "wood" in the interviews were made by younger boys and none by younger girls; the difference is not marked for the older grouping of children. Similarly, all five visits to woods on the place-expeditions were with boys. One partial explanation may be that because young girls' spatial range is more restricted, they have had less opportunity to contact woods and to develop an interest in them. A more likely explanation I can offer is again related to what boys consider their role preparation. In many ways the boys come to learn that men, and hence they, are the explorers and hunters. They become convinced that it is they who must fight whatever ugly beast might come out of the woods. They no doubt extend through imagination the old myths of the woods, broadcast in modern form through books and television, for this way their fascination and fear grow hand in hand. Supportive of this role-related explanation of boys' fear of woods is my informal observation that the boys with the greatest degree of interest in the woods are the sons of men who themselves engage with woods and wildlife in their work or for sport. This interesting paradox of attraction and withdrawal will be further discussed under the following section on "Place Fears."

Fields and hills (20, 5) are places described by children as being valued for exploring, hiking and picnicking, though one child chose a certain hill for its kite-flying qualities. Not surprisingly, all but one of the children who chose these places are in third grade or older; for younger children, exploring is limited to the mother's hailing range. There are two reasons why I think that relatively fewer hills were identified on the place expeditions. One is that when "in the field" children focus more on the specific qualities which interest them about the place so that instead of "hill," for example, they might show me a "look-out place" associated with that location. This tendency may have been further encouraged by the polaroid camera, which the children may have wanted to focus at more specific places than an empty field. One place particularly valued is Town Hill (Map Figure 3-2). The children of Greenlawns Hill are allowed to visit this alone. It offers a superb view of the southern valley of Trout River and it has picnic tables. Adults rarely use it, and it has become a special place to these children to visit especially for picnics. They seem to consider it their place. I believe it has developed this quality because, although it lies within their "accompanied range," it is hidden from view of any of the parents' houses.

The child's "ballfield" place category, mentioned above, consists of mown fields near to the children's houses which they are allowed to use. In addition, some children selected lawns (7, 6) and said there was no single reason for liking them. These lawns offer a suitable alternative to the ballfields, especially for the younger children for they are immediately adjacent to their homes. Various modified games can be played on these surfaces. Not surprisingly, the children prefer a large, open, flat lawn to a banked lawn with more than a few bushes and trees. In addition, two children explain that they like their lawn because they have picnics on it.

Sliding places (6, 7) were identified proportionately more times on the place expeditions than during the interviews. Again, this is related to the qualities of the different methods. On the place expeditions

the children would frequently want to show me how they used a certain place. No doubt children being interviewed inside a classroom would not only be less likely to remember, but less inclined to describe a certain sliding place than when they could actually take someone to such a "great place for sliding." The great value of suitable hills with good slopes is emphasized by the fact that so many children identify them at least three months away from the presence of any snow. This demonstrates that while the interview and expedition data are probably seasonally biased, children do not find it difficult to recall some of their out-of-season play.

Climbing trees (4, 9) are identified more often on the place expeditions for the same reason; in interviews, children probably feel an adult would not understand why a tree is so highly valued, but standing on their door stoop, there is no hesitation in hurrying the adult toward their favorite tree. It is notable that this valuable climbing "equipment" is enjoyed by young and old, boys and girls. In addition, some of these trees, along with certain bushes, are valued for fruit picking (2, 5). In fact, a considerable premium is placed by children on knowing the "secret" whereabouts of such highly valued food resources.

It is noteworthy that all types of play equipment responses combined, number far less (2, 4) than climbing trees as favorite places. Also, rope swings (2, 2) are related qualities of trees valued by the children. Jumping places (3, 1), and climbing places (2, 6) other than trees, are similar examples of "play equipment" which children create in all kinds of unlikely places. The very large sand-pile at the town garage is used for sanding the roads in winter. It is highly valued as a place for jumping and somersaulting by the children from School Street and North Hill. Similarly, the "sandbank" (Quarry, in Map Figure 3-1) is renowned among the children as the place for the more daring climbers.

Brooks or frog ponds (9, 5) are so important to some of the children that they recall them during the interviews, in spite of what has been said concerning the tendency to not mention small places except during the expeditions. "Brooks" as used here does not include the two rivers in town but refers simply to the tiny rivulets found on all of the hills. Had the expeditions and interviews been conducted in May, there would no doubt have been more of this category of place included, for many of them had dried up by August and September when the place expeditions and interviews were conducted. A great deal of time is spent dabbling in these places whenever they are accessible.

Hiding places (0, 5) are like lookout places in that they are only mentioned on the place expeditions; again, the limitations of the interview method are responsible. Children place considerable premium on "finding" special kinds of places or paths that no one else knows about. Hiding places fall under this category. They are usually bushes, although ditches, underneath stoops, and "caves" also serve this purpose.

Streets (9, 0) and parking lots/driveways (5, 3) for cycling are identified as important children's places through the interviews, but not in the place expeditions. Again, I believe the influence of using cameras

in the place expedition method comes into play. An empty street or parking lot does not make an interesting-looking photograph, so the children probably chose not to lead me to these places. Fortunately, the interview method clearly reveals their value. Unlike large areas of cities and especially the suburbs, a small town like Inavale has a real shortage of hard surfaces available for cycling, roller skating, or go-carting. What spaces there are, are highly valued. Of the nine cycling streets mentioned, seven are mentioned by older children, five of whom are boys. This pattern accords with the development of bicycle use described in Chapter IV. Older children indicate specific "track" cycling places valued for their exciting topography such as the bottom of the quarry, around the factory, or on the ballfield. Younger children seem happy just to have a place to cycle, usually their home driveway.

Animal places (9, 3) are valued by younger and older children either because of children's affections for their own animals, or for those of friends. All are horse barns or paddocks except one of the places mentioned in the interview--a third-grade boy's rabbit hutch.

Sandpiles and dirt-play places (5, 2) are mentioned by remarkably few children given the amount they are used. It is less surprising in the interview for all such small places are seldom mentioned. One possible explanation for the low rating on the place expeditions is that these play places are so close to the home (commonly by the front door stoop) that the children found them less interesting to visit.

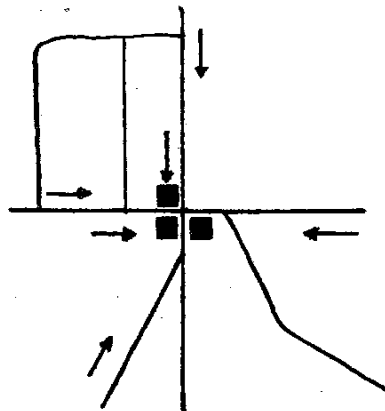
Most of the remaining categories of place preference involve two children at the most, and so are reserved for discussion within The Family Studies (Chapters VIII and IX). Some of these places, however, share an unusual quality which deserves special mention. The same children who choose the graveyard (2,1), scary/haunted house (2, 1) and bear cave (1, 1) as favorite places also choose these places as scary places. Similarly, this is true of many of the children who select the woods. It seems that the scary quality is not necessarily something to be avoided, but in fact, is often the quality which makes a place particularly fascinating and ripe for exploring. This subject will be developed further in the subsequent discussion of dangerous and scary places.

Inside home (11, 0) is a category of place which could not occur on the place expeditions as the children were specifically limited to taking me to places outside. Ten of the 11 responses in this category are made by girls, seven of them by girls of the second and third grade. Most of these references are to the child's own bedroom. Perhaps because girls are more restricted in outdoor play, they have made more out of their own indoor space and probably use it more. Also, perhaps because they are girls, they have been encouraged more by the parents to modify their bedrooms and make them into more intimate spaces.

"Commercial" Place Preferences

The downstreet stores (32, 11) and the ice-cream stand (30, 13) are easily the most valued commercial places to the children. Most store ref-

erences are to the three stores at the town center crossroads which are fortunately located so that young children from each of the three hills may walk to them without crossing either East Main Street, West Main Street, or Snowdon Road. Twenty of the 33 children of third-grade level and younger select these as favorite places. It is not accidental that each of these stores carries an ample assortment of candy. One of these three stores charges higher prices than the others. Even the youngest children are aware of this, and the store is avoided by most of them. However, other children who are not allowed to cross Snowdon Road, or when it is the only store open during vacations, do patronize it. For this reason, only three children list it as a favorite place and, during the interviews, the children volunteered five different, highly abusive names for the store. A number of children also chose the Universal Supermarket (15,2), but because this is not accessible to most children of the younger age group, the majority (11) of choices are by children of the older group. The younger children very frequently visit this supermarket with their parents but following one's mother around a store buying groceries is no doubt a qualitatively different experience than having the choice to go there with one's friends to buy a soda or candy. The ice-cream stand (30, 13) by comparison, is always visited for its own sake by whole families, and so there is no age-related pattern of preference.



The complex of tourist stores on East Main Street was selected by six children. This area is out of bounds to all but a few fifth- and sixth-graders (Chapter IV). Therefore, many younger children do not know that it has scores of wonderful old-fashioned knick-knacks for children. Five children selected the remaining clothing, jewelry, and antique stores; four of them are fifth- and sixth-grade level girls who enjoy browsing and visiting the young women who run the stores.

Gas stations (4, 1) are selected because they supply air for bike tires and nuts and bolts for various tools, but most important, because the children can watch men fixing cars. It is one of the few places in the town where men can be seen at work. Four of the five selections are by boys.

"Social" Place Preferences

Over half of the preferred places under the category "social" in the interviews and during the expeditions are the homes of another elementary school child (130, 25). There is no notable variation in terms of age and sex. Relatively few children chose the homes of adults (28, 4), but of those who did, a larger proportion are girls (18, 4). This is, I believe, a reflection of the larger amount of time spent by girls with adults. Girls stay around their own homes more, and older girls are occasionally hired by

adults.

It is particularly noteworthy that of those children who select their "parent's work place" as a favorite place (10, 3), all but two are boys (9, 2). This is probably a reflection of my earlier observation that children have less opportunity to see or be with their fathers in their work than with their mothers. This, coupled with our society's emphasis upon sex-role socialization, probably leads boys more than girls to value places where they can observe adults of the same sex at work.

Of the eight children who identify the High School as a favorite place, seven are of the younger age group. This is the place where they gather to catch the bus in the morning and for many of them, it is the place where their most highly revered elder brothers and sisters go to school.

Recreation programs (Brownies, Girl Scouts and 4-H Club) are more highly valued by the girls (6, 0) since for some reason the boys' programs have, for several years, been less successful in attracting members. Bowling (6, 0) is enjoyed by girls and boys as a family activity; although it seems to be treated by the children as more of a social experience than as a serious game. Church (10, 2) is also a good opportunity to see friends on the weekends. Perhaps this is one reason most selections of churches are made by girls.

"Aesthetic" Place Preferences

Very few places were selected because of the way they look or the way children feel when there. Children may find it easier to describe and explain places which they use for some purpose or other, for I did not specifically request the inclusion of places which they "felt" good in, or liked to look at, etc. However, some children did describe how they liked to look at places. Most often these are houses (8, 1), but looking at mountains and water are also identified by two children. I had the distinct impression that these children were repeating the descriptions they had heard their parents make of these same places. During the expeditions they were much more in touch with their own place values, and the strong "learned" quality of their aesthetic judgements almost disappeared. Demonstration that not all visual preferences borrowed from adults was provided by two young children who independently described how they liked to watch the town's traffic light change colors!

Places of Attachment, Seclusion and Quiet

The first supplementary question of the Place Expedition exercise asked the children to describe places, apart from their house, where they felt like they really belonged or in which they felt very comfortable. The question appeared to be too abstract for the children and they either failed to respond or selected seemingly arbitrary places from their favorite places which they were unable to discuss in the terms required. Clearly there were such places but again one can only discover where they are by observing the children in these places over a relatively long period of time. A more ef-

fective question which each of the sub-sample children could relate to, to some degree, was "Which places do you most like to go to when you are alone? I learned from responses to this question, and from observations throughout the course of the study, that some of the most important places in a child's environment are experienced alone by him or her; not all primary place values are socially defined. These places had sometimes become important places of attachment or security in times of trouble as with Wendy(10): "Underneath the desk in the sewing room. I go there like when my mother's been yelling at me and tells me to go to my room, instead of going to my room I go to one of my special places like that." Contrary to the urban and recreational planners image of children as desiring to continually run, jump and climb, some children search out quiet places to be alone. These places very frequently carry water, dirt or sand and are sites for hours of quiet introspection often dabbling seemingly aimlessly. Such activity is all too easily dismissed by us but it may well be extremely important to a child's development (see Cobb, 1959). Another common quality of these places to be alone is the presence of an animal. Lucy (7) promptly responded to my question: "Under the porch because I like to play with my kitty cat because he comes when I'm there. My sister can't get in there because it's too low so they shout at me and sometimes I hide back in the porch, but if they see kitty cat they guess I'm there."

The question of places for children to be alone is worthy of further pursuit by the recreational planning profession for it was clearly important to the children and yet has been ignored in planning research. Unfortunately, it demanded more careful and focussed attention than I could give it in this initial investigation.

Disliked Places

So few children responded to the question on "disliked places" that it was dropped from the interview. It is not surprising that they have no interest in trying to recall places they do not like. The lesson to be learnt from this is that if one wishes to discover what places are disliked by children in an enduring way one would have to observe which places they choose not to visit. The only broadly applicable generalization that I can make from this study is that children dislike places which are under the continuous overseeing eye of authoritative adults. Beyond this, children's disaffections with places are related to specific events and hence are usually unique and short-lived.

Valued Places Outside of Inavale

During the place preference interviews some children suggested places outside of Inavale. I asked them to substitute these places with favorite places in Inavale in order to maintain a basis for comparison. However, I kept a record of the out of town places mentioned. The sub-sample of children were asked specifically, after the place expeditions, to describe their favorite places outside of Inavale. The category with the largest number of entries was undisputably various stores in the four larger

towns lying between 20 and 30 miles from Inavale (16) (1). Following this, the children's summer and winter vacation haunts were selected (12), six of them, it was explained, were valued specifically because of an ocean or a lake. Relatives' houses (12) it seems were largely selected because they offered opportunities for friendships with cousins and other children. Other children chose houses simply because they possessed a swimming pool (5), or because the house was beautiful (4), such as "with great stairs, all carpeted." A few children selected the various out of town amusement parks and model colonial museum towns (7). The remainder were not too easily classified by place: at work with father wherever he may go (2), hunting with father (1), driving on country roads (1) and "driving in the back of our truck with the wind in my hair (1)."

This list was a reasonable reflection to me of the nature and frequency of the children's travel patterns with their parents. More interesting are the children's expressions of their place investigations in response to the two questions of where they would like to visit or places they had never before been to and where they would most like to live if they had complete freedom of choice.

Desired Place Beyond the Horizon

Regrettably the question on unknown places which they would most like to visit was not asked during the school interviews and was not asked of all of the sub-sample children. Neither was the question asked of "Where would you most like to live?" Nevertheless, the 36 responses to these two questions offer interesting insights into the sources of children's place information. This unknown subject area is worthy of investigation by any persons interested in improving environmental and geographic education through an understanding of children's environmental learning.

The single most important source of information on desirous places to visit or to live, it seems, is word of mouth usually from adults but occasionally from child-friends. All of these exciting and beautiful places lay outside of the state and the majority lay beyond New England. No doubt the children have heard others speak most enthusiastically about these exotic places. Certainly they have very little idea themselves of their distance; they would rarely be able to say if Florida, Niagara Falls and Texas lay further away than the city of Boston (see Chapter V, above). Most commonly, certain key qualities of these places, as recognized in the above section, are identified as the reason for liking them: "Maine, because Ellen's been there and she told me it's good; there's all sorts of swimming pools and a nice river (Peter, 9);" or "Florida, where they've got all those beaches and I could lay out in the sun; Janie (classmate) told me all about it (Wendy, 10);" or "Ontario, Canada; my mom went there; I could see Niagara Falls (Joe, 6)." Less often, children respond with places they have mused about because a very good friend or family member is from there, perhaps they feel a visit would help them know more about the person. Running close equal, serving as sources

1 The number of times a place was mentioned during the place expedition follow-up interview, in each category is expressed in parenthesis as a raw figure.

for interesting and beautiful places to visit or to live, are television and books. One response revealed the power of T.V. commercials: "A fair in New Hampshire; it's the cleanest fair in the world and there's things for adults too, and they said 'don't wait, tell your parents now'; I think this fair must be right next to Uncle Gus' Show" (a children's T.V. program which is interrupted by this commercial) (Lucy, 6). Picture books and magazines still attract however: "Iceland; I'd just like to see what it's like. I saw a picture and it looks like ice. I'd like to see if you'd be able to find things in the ice like fossils or patterns (Casey, 10)." The Social Studies books of school with their national caricatures and stereotypes also manage to influence children's dreams: "I want to go to Japan because of their dresses and their hair, fans, dogs, and stuff (Wendy, 10)." Only one gave instances of a mapbook influencing his attraction to places: "I'd like to take trips to Washington, the state not the city, I don't know anything about it but it's right up in the corner of the map (Casey, 10)." Occasionally, children generalize from indirect experiences of their own, as with China: "It's nice food, we went to a Chinese restaurant." But almost half of the images seemed to come from a melange of sources: "New York--you can swim almost everyday 'cause it hardly ever rains. It's a big city. It has big roads and in the night you can go ride bikes on them 'cause there's no one on them (Emile, 8)." Another child explained, "I'd go away off so people wouldn't bother me. I'd go where it's quiet; no honk honk like at The Rainbow Bar. And not so many neighbors 'cause sometimes they're trouble makers. I'd live alone with a good friend like Jane. I'd probably go to Africa; somewhere where it's nice and birds sing. I'd hate to go to China--you'd have to hear all that China talk. Hawaii maybe 'cause I saw it on T.V. and it sounds good. Maybe Maine 'cause I know Alan (classmate) who moved there. Is that a different state from this (Peter, 9)?"

A strong negative image of big cities has reached children at least by their ninth year, for some children responded voluntarily to my question on places to visit with such statements as "the trouble with New York is there's too much smog and too much people (Annie, 9)" and "I'd hate to be in Boston--a guy went out to get his paper and he got shot this morning--I heard it on the news (Bobby, 9)." There is almost no urban environmental education provided in the schools to balance the popular negative images passed on by word of mouth and by the mass media.

Dangerous and Scary Places

There is some duplication in children's responses to the questions on dangerous and on scary places (Map Figures 6-1 through 6-4). Abandoned buildings, woods, snakes and bears' places are all frequently mentioned places listed in both tables. This might suggest that scary places are seen by the same children as dangerous places but this is not usually the case. Of the 26 cases in which these four types of places are listed as being dangerous, only seven are also mentioned by the same children as scary. Since the question on scary places was put to each child after the question on dangerous places, it is possible that their response to the former influenced the latter somewhat, but this effect is probably not great, for the children seem to have rather distinct notions of what the two terms, "dan-

gerous" and "scary," mean.

The dangerous qualities of these places are readily articulated. The four children who list a vacant building as both scary and dangerous explain that it might cave in. Similarly, the children who mention the woods have very specific fears of the presence of snakes or bears which are dangerous. In comparison, the children are usually less specific and less able to articulate the scary qualities. This seems to be a distinguishing quality between the two lists in general. Those children who list places as being dangerous but not as scary, usually boys, insist they are scared of nothing, even though they had just described the dangerous animals of the woods. It is possible that without the previous "dangerous" question, they may have responded to the "scary" question by mentioning these places. To have checked this out would have demanded experimentally manipulating the order of questions. It is sufficiently interesting for the time being to note that these types of places are high on the list of children's notions of both what is dangerous and what is scary. With these minor qualifications on the ambiguity of the two terms in mind, children's dangerous and scary places will be considered in turn.

Dangerous Places

Only parents of the sample population of children were interviewed, but their responses to the question on dangerous places for their children are sufficiently detailed to reveal a high degree of congruence with the most frequently occurring children's statements of what is dangerous (Map Figures 6-1, 6-2 and 6-3). Many children refer to their mothers' ideas when answering this question. The traffic on the roads is considered to be the greatest danger by the mothers and is a notion that has clearly reached the children. Also grouped under this category are busy parking lots and driveways, most notably the large car park in front of the supermarket.

The parents interviewed are as concerned about the three hill roads in town as they are about the busy main street (Map Figure 3-1). Although the roads are not as busy, the parents complain of the speed of the cars on these hills, the lack of sidewalks, and, for children who cycle, the danger of losing control while cycling down them to the town center. A particularly dangerous spot in the minds of both parents and their children is the traffic light intersection. Though overhead lights had recently been set up to give some time for pedestrians to cross, the parents claimed they are confusing and dangerous for their children. It is this danger which explains why children below third-grade level are not allowed to cross at these lights alone (Chapter IV). It is interesting to note that the Snowdon Road is mentioned specifically by only one of the mothers and four of the children, even though it is easily the road most subject to parental restrictions as discussed in Chapter IV. This is no doubt because it is such a forbidden place for the children that there is no question of it being used by any of them. It therefore did not enter the parents' or all but a few of the oldest boys' minds as being dangerous to them at all. The fears of the danger of traffic for children are, according to the literature, very well founded (Appendix A-1). Not until 10 years of age, it is claimed by Scandinavian research, can children compete on equal terms in traffic with

FIGURE 6-1: DANGEROUS PLACES (parents, n=7, of 18 children)

KEY: Landscape Elements mentioned by Parents

each occurrence of ● or — indicates one reference.

each occurrence of ⊙ or — indicates three references.

Examples of multiple references:

⊙ = 2 references; — = 2 references

⊙ = 5 references; — = 5 references.

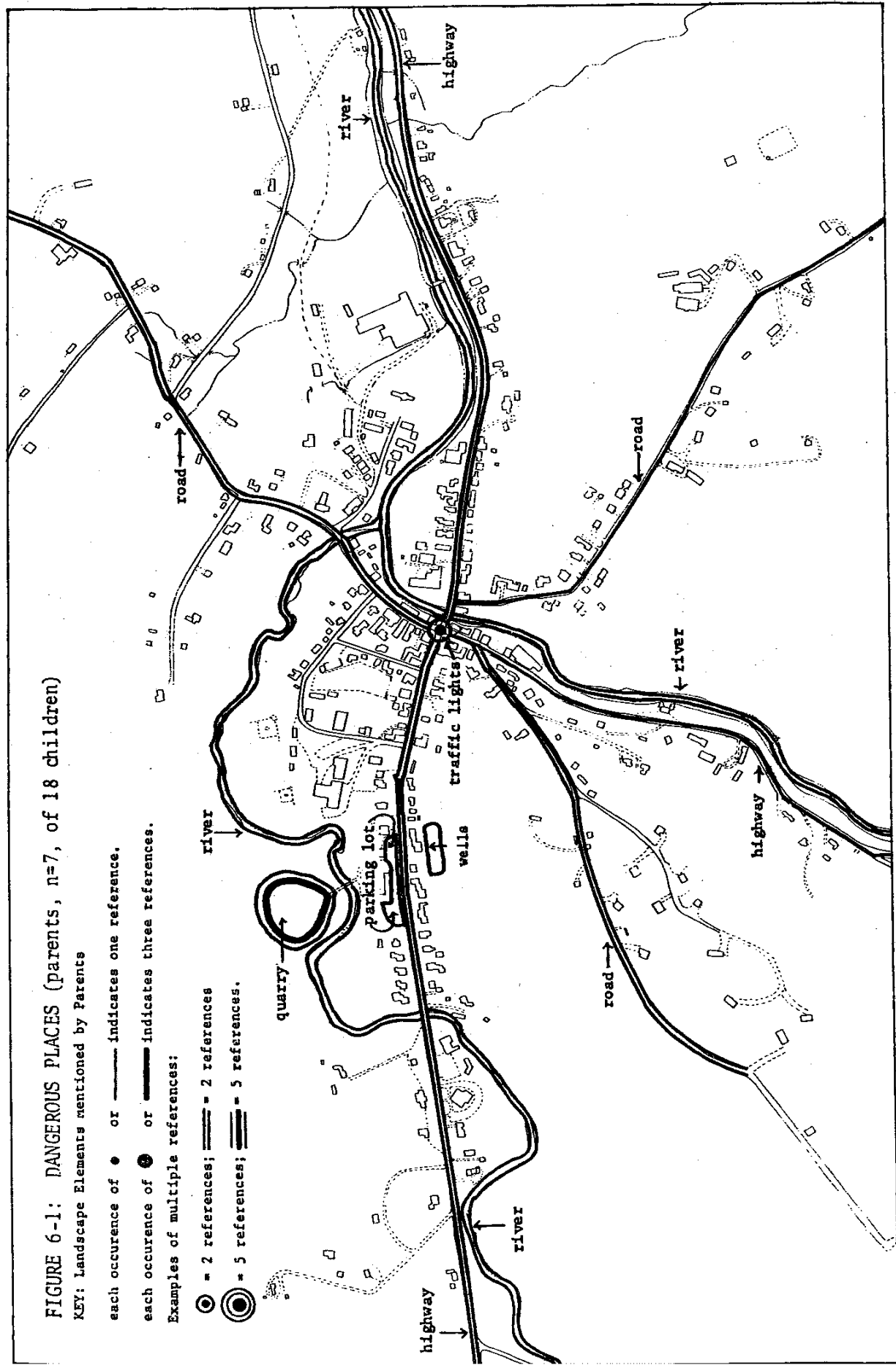


FIGURE 6-3: DANGEROUS PLACES (grades 4-6, n=32)

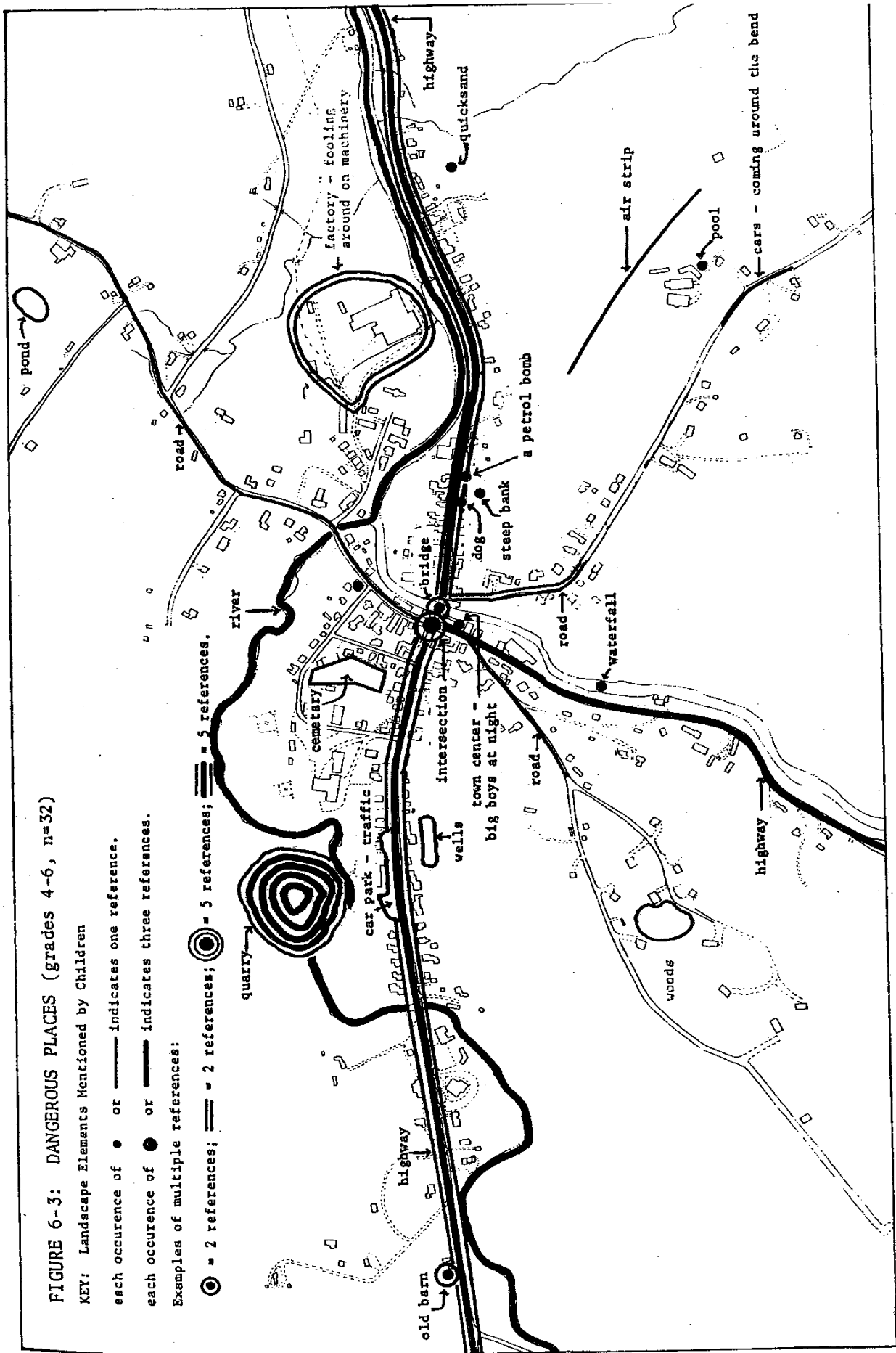
KEY: Landscape Elements Mentioned by Children

each occurrence of ● or — indicates one reference,

each occurrence of ● or — indicates three references.

Examples of multiple references:

● = 2 references; — = 2 references; ● = 5 references; — = 5 references.



adults (Skandia, 1971 and 1974). Children were found to be inferior both perceptually and in physical coordination. In addition, it was concluded that they are more likely to be hit because, with their smaller size, they are less easily seen by motorists.

The reason so many mothers and their children mention quarries is that two months before the time of the interview, a boy was buried while climbing up the cliff-face of the town's sandbank. All response under this category, except one boy's reference to the gravel quarry in town, are related to this sandbank and the recent tragic death. In the months preceding the accident, mainly boys of fifth-grade level and older, had been playing on it in spite of warnings made by the police to parents and children.

Younger and older children alike have been made aware that the two rivers in town are dangerous places. It seems to be common knowledge among the parents that a child can drown in very shallow water indeed. It is for this reason, more than not wishing the children to get dirty and wet, that rivers are out-of-bounds to so many children (cf. "Spatial Range," Chapter IV). The use of rivers by children is a subject of considerable conflict for parents and children since as is revealed in the previous section, rivers rank third in the list of children's preferred places. While many children of third grade and over were shown in Chapter IV to be allowed to use these rivers, these data reveal that girls and boys continue to see them as dangerous elements of the environment through the fifth grade.

The fear of rivers, not surprisingly, extends to lakes and ponds, or as two more dramatic children call them, "quick sands." An old West Main Street couple, with a longer memory than most of the folks in town of what dangers have befallen children in the past, have warned the parents and children of those families living on West Main Street of dangerous wells, with rotten, loose boards covering them, hidden in the new woods behind their homes. Abandoned wells such as these are scattered all over the town among the secondary growth. They are extremely dangerous but will presumably only enter the taxonomy of parentally defined dangerous places after some accident has occurred. Only one child of the seven West Main Street children recalled the warnings of their elderly neighbors when I interviewed them in the school.

The remaining categories of dangerous places identified by the children seem to be the result of a variety of influences: other adults' warnings, individual children's experiences with danger, and the "folklore" of the children's own culture. The factory machinery, gas tanks, and sawdust pile are the subject of occasional warnings by the factory management: all of the four children who identified such places are fifth-grade level boys, the only ones able to travel so far afield. Many of the places mentioned by only one child such as "the house with the dog that bites," ditches, trees, steep banks, manholes, icy steps, etc. are undoubtedly the result of individual encounters. In marked contrast is the high degree of consensuality over such places as abandoned buildings, woods, and graveyards. These places, to be dealt with in greater detail under "Scary Places," are almost archetypal fearsome elements of children's folklore which remain the same now as when Mark Twain used them so successfully in his child-adventures over one hundred years ago (Mark Twain, 1876 and 1896).

Scary Places

The data summarizing scary places (Map Figure 6-4) should be considered together with that on dangerous places, for as is discussed above, some children see "dangerous" and "scary" as the same thing, and some others, while not admitting fear of anything, mention as dangerous places such usually scary haunts as abandoned buildings and woods.

Parents were ill-informed about children's fears. This accords with the findings of a study by Lapouse and Monk(1959) in which mothers under-reported their children's fears many more times than they over-reported them. Had I relied solely on the parents for information, as many of the earlier studies had done, I would have learned many of children's fears about the house and of their general fear of being left alone by mothers and of the dark, but little mention would have been made of their fears of places in the outdoor environment. In contrast, some children mentioned half a dozen or more types of place-fears they have, and only eight children claim to have no places at all which scare them; all eight were of the upper grade levels (fourth through sixth). In addition, more places were mentioned by the 25 younger children (79 places) than by the 24 older children (56 places). This may simply be because older children are less willing to admit that they are scared, but there is experimental evidence that fears of a tangible nature (being left alone, walking across inclined boards, entering a dark room, encountering a strange person, snake, or large dog, or hearing a loud noise) decrease with age (Jersild, 1943).

Four categories of scary place accounted for 65 percent of the places described by the children: abandoned buildings, woods, a child's own bedroom at night, and other places in the home--usually cellars and attics. The high degree of consensuality among the children over the first two types of places is surprising given that they are not specifically described in any of the studies of children's fears reviewed in Appendix A-3. It is less surprising however, if one reads the classic children's novels which were no doubt drawn from the childhood experiences of the authors as well as from general place folklore. Both woods and abandoned buildings may perhaps be explained in part in terms of children's fears of the dark, which the psychology literature does recognize (Jersild, 1943; Bowlby, 1969). But there are many other equally dark places, some of them considered scary by the children, but none of them to the extent of woods and abandoned buildings category. Some clues may be gained from looking at the specific descriptions of these places as given by the children.

Ten of the 20 children who express fears of abandoned buildings refer to one particular burnt-out house near the center of town; five of the 11 abandoned buildings described as dangerous refer to this same old house. Various descriptions of this house were volunteered by the children. Consensuality over descriptions of such elements as the burned bed and piano confirms that some children have entered the house. It is most interesting to note that this house is also one of the places most frequently described by the children as a favorite place. It had apparently been accidentally burned down two years before by three fifth- and sixth-grade boys. For some reason many children are fascinated by this house, and although they long to enter it, they dare not. Somehow they have developed myths about

this place which extended to "a dead guy," "a skull," "a dead lady," and "ghosts." Also children frequently associate snakes with these abandoned buildings as well as with other buildings such as sheds and cellars. Snakes are one of the common fears of children found in past studies (reviewed in Jersild, 1943; and Bowlby, 1969). Unfortunately, these previous studies had not asked anything specific about places. It does seem however, that fearsome animals are related to rather specific habitats. Woods, the second most frequently mentioned scary place category, are usually associated with bears. Similarly, bats were associated with trees and caves by two children. Other children mention dragons and goblins when describing woods. One first-grade girl explained that the woods just remind her of scary stories, as though she does not really believe there are such things in the woods. But rationality by no means necessarily removes such fears which often remain with us through adulthood, even in the face of most informed knowledge of the denizens of woods. The fear of getting lost was not mentioned by any of the children, but it is most probably a general fear associated with dark places. Probably the primary fear of woods is that they are dark--the fear of the unknown which lends itself to the boundless exercise of the imagination. This fear of the woods may perhaps be traced back at least as far as the middle ages when the Germanic folk tales (still read to children today sometimes in contemporary guise) were passed down to us by those whose forest frontier was full of many dangers, both real and imagined.

It is most noteworthy, therefore, that 18 children described the woods as their favorite places. Many of these are the same children who described their fear of the woods. Such contrary feelings for the same place complicate the description of any child's phenomenal landscape. They point out more clearly than any other data of this study, the simplistic nature of the "mental map" conception. People do not have clearly defined selective images of the world; they have multiple worlds: perceived and imagined sets of places which change both in structure and meaning according to the purposes and feelings of the moment. Sometimes one place may carry absolutely contrary qualities for a person, resulting in both approach to, and avoidance of, that place. So it seems to be with children in their relationship to woods, a mystery which gains some illumination from the focused study of one boy's relationship to the woods in Chapter IX.

Children's fears of their bedrooms are clearly associated with the fears of the dark, a fact recognized by both children and parents. The fear of being alone and the fear of the dark are probably correlated. As the light is switched off, all the physical reminders of security disappear; the house as haven is replaced by the universe of imagination. The same is probably true of other dark places in the home, but attics and cellars seem to be particularly scary places. There may be factors other than darkness which make them so. One 10 year-old girl explained that she used to be afraid of her cellar but that she is not anymore because there is a ping-pong table in it. It is as though the familiar object serves as a reminder of its habitation and use by the family; perhaps the home as a "sacred space" is a socially-defined phenomenon. Similarly, one seven-year-old child described the school stage as a scary place--a peculiarly large and empty space in an otherwise well-used familiar environment.

Many of the remaining scary places are described as scary only at night or, in the case of two children, on dark and thundery days. A road with trees was experienced as "creepy" to one eight-year-old boy because of the way the branches joined over the road, making it dark even during the day. In dark trees the imagination can find thousands of grotesque figures and can animate them. Similarly, one fifth-grade girl is particularly frightened by a pile of smashed cars for she sees all kinds of different "faces" in them. Other children explained that they are scared that some specific thing might come out of the trees while they are walking along the road at night, such as bats or people. The cemetery and the church, and fire station next to it are considered scary by four of the children. These places are on quiet, safe streets in the center of town and parents sometimes allow their children to walk home via them from events at the High School after dark. The parents have forgotten that their own fears as children were not limited to traffic, falling, undesirable people and other parentally-defined dangers. Like abandoned houses, cemeteries become haunted places, the subject of stories and games by children. Though not discussed with the same fascination in later years, these places probably maintain some of these powerful associations throughout adulthood. Perhaps like the woods, the roots of some of these fears in children reach back thousands of years into our culture.

On the Experience of Moving Home

I had anticipated at the outset of this study that the event of moving home would offer some valuable insights for me into children's experience of the environment. This belief grew out of my own attempts to recall my childhood environments. I noticed that it was particularly easy for me to recall my experiences shortly after my move into my new homes. I surmised from this that the moving experience leads a child, or any person, to reflect upon those places, people and things which they value in their old and in their new environment; it is a natural way of preparing for adaptation. With this in mind I planned to follow closely any moves which might occur. Unfortunately there were remarkably few moves and they usually gave the children too little warning for me to hear about them in time. I was able however to talk with four children before and after their moves to new homes.

I learned from three of the four children who moved, that the presence or absence of other children was the most important consideration. In all three cases the children were moving to the edge of town and were worried that they would not have friends to play with. The availability of friends is probably the single most powerful influence on children's activities in rural areas and the children seem to know it. Wendy's (10) own summary of her imminent move puts these remarks in context:

I love this house because when I moved to Greenville I couldn't get used to it, but I got used to this house. The Greenville house was in the woods; there weren't too many friends around there. I have lots of friends here--I've got used to it. The good thing about moving now is that we might live on Plum Hill and then I could walk up the hill with Annie,

Maria and Sybil and I could play with them everyday. I'm going to miss the rope swing though and Mr. Gate because he always gave me ice cream and Barbara because she always comes down to play.

But friends are not always the major concern as Clark (9) revealed to me when I asked if he was happy about his move from Field Lane to West Main Street a few days after the event:

At first I wasn't because I wasn't used to it, but we've got three sheds to play in, we can play hide and seek in the tall grass and the hills are this steep (holding his arm at a 70° angle). But we had two sandboxes at the old house and we don't have one here--just a tiny one in the attic; it's only big enough for two dune buggies.

This description of physical environmental qualities contrasts with the other three children, all of whom were girls, who dwelled almost exclusively with the physical qualities of the house itself rather than with the exterior. A careful study of children's moving experiences to a new housing development would be a suitable way to discover how generalizable these few observations are.

The Sand-Modelling Experiment

As an alternate method for learning about children's evaluations of places I had planned to ask each of the sub-sample children to rebuild Inavale in a sand-box. I was able to conduct only one pilot test of this method before the cold weather of winter set in. It is described here because of its potential for future studies, perhaps by planning and design professionals. The extract is taken from my log. Casey (10) was asked to:

Pretend you have the chance to rebuild Inavale the way you would like it to be. Keep the same people living in the town, but build it the way you would like to see it. You may move the sand any way you want to and you may use anything you wish to build with. If you need any other things to re-build the town with, just let me know (surrounding the 8 foot square sand-box was a shovel, rake and hundreds of small pieces of wood of all sizes).

Casey (10) understood the idea immediately and announced that he would build his house on the Grandville Road (presently on the Middleton Road). He moved to the center of the sandpit and built crossroads. Not only was this basic town form maintained, but many of the same places were mapped. The locations however were dramatically changed to suit Casey. His home was placed very close to the crossroads. The town supermarket, drug store, post office and lake were brought right into the center of town and placed next to the crossroads in each of the four quadrants so formed. Two giant supermarkets, one from Middleton and one from Grandville, were moved into town; on the Middleton and Grandville Road respectively.

All of this is achieved within five minutes accompanied by an extensive running commentary on why the new locations were made. The sand was a little too coarse, and too dry to enable Casey to model places, so we finished the project prematurely, but clearly the technique worked well. The building proceeded much more quickly and fluidly than the landscape modelling method, described in Chapter IV, for modelling the town as the children know it. The task of building a place the way one would like it to be probably demands less reflection. Also, sand seems to be much more suitable than blocks and toy models for quickly expressing one's most immediate thoughts and feelings. Should anyone utilize this technique, in the future they should be certain to make a tape recording and ideally a video record of each modelling session for it is impossible to maintain accurate written records so quickly.

Methodological Lessons from the Place Expeditions

I quickly learned on the place expeditions that what I had anticipated to be a single ethnographic interview was truly participant-observation. With the younger children (under nine years of age) I became, like them, an explorer but with the child in the lead. No matter how much I encouraged them to think of places before we set off to visit them, they would quickly find other places which they found more important. This contrasts strongly with the older children, who would conceive of the majority of their places before leaving and even find enjoyment in the task, voluntarily rating them in order of preference. Their trips were more matter-of-fact in nature, suggesting a greater objectivity of place experience. Clearly they were still capable of experiencing the excitement of exploration, but this was not their normal mode of place experience as it seemed to be with the younger children. Place naming, it may be hypothesized serves not only to order the world in space but also in time: the older children more readily recall places and fix them in a mental plan of action, a prescription for future behavior. For the younger children the plan of action changes momentarily. The unknown world is never far away for them and it seems that the mixture of excitement and fear that are the dimensions of exploration were always nearby during our place expeditions together. Wishing to learn about all of the kinds of places important to these young children, I had to amend my academically-given methodological ideas.

The more I allowed myself to be "led" by a child, the more I experienced that child's environment. Only by allowing myself to experience their "view" of the physical environment and then stepping back in order to describe it, could I approach any holistic understanding of child environment situations. My only necessary role was to remind the child occasionally of the focus of my interest--places. I did not limit myself to the pursuit of understanding any particular issue; instead, I attempted to experience as much as possible and describe as well as possible, the places I visited with each child on the place expeditions, using their own words and their own actions at each place, and en-route. Only afterwards, did I go over these descriptions and probe further with the children. To probe too much at the time of the expeditions would ruin the child's willingness to carry me to his or her places. It

would destroy his or her openness in describing and showing me the uses of and feelings for any particular place. The kind of information offered by this method is best expressed from a log entry of one child, Emile(8):

August 31st, 1:00PM, Sunny and hot. It is not clear what system Emile uses for returning home, but certainly the state of his stomach is an important element. I'd spent an hour searching for him because I wanted him to lead me on the remainder of his place expedition. Finally he came whipping along the road on his bike and, in anticipation of our expedition, scoffed his meal. First, he planned to take me to his new fishing place, "Did you see the path with the stick across it when you were looking for me? That's my path, my sister and I made it." The stick serving as a gate proved to be like any other stick along that stretch of highway flanking the river. But once Emile had pointed it out, the "gate" and the line of beaten-down grass leading down to the stream were clear to see. He closed the "gate" behind us. It was like entering Emile's estate. This feeling was transmitted by the intimate way he moved through the long grass which was as tall as his shoulders and, at the bottom of the bank, by the selective route he used to lead me across the river. Jumping along the bank from rock to rock, we headed toward the fishing place. Suddenly he caught sight of a shale bank on the woodland edge of the stream, and immediately he changed direction towards it. Crouching low in the shale, Emile expressed disappointment over the rains destruction of his building efforts. "Me and Therese (ten year old sister) made it yesterday. That's New York up there between the two rocks and that's New Hampshire right below it with all the roads going over the wooden bridges, and down there is the road to our cove." He identified a dug-out area on the bank as a hotel and a pile of twigs as the lumber yard "up in New York." Talking fluidly, he hurried me along to his fishing place, convincing me it was "the fishing place" and that no one else knew about it. Many fish were noted with appropriate "oohs" and "aahs" before we photographed the area and moved on to his swimming place. While photographing the area, Emile's sister arrived and asked if she could join us. We had already seen many more places than Emile had originally planned to show me so he decided to take me to a place he has shared with her. The three of us meandered down the bank, leaping between giant rocks whenever they offered themselves up to us, and stopping at pools whenever the children's keen eyes detected a sign of life. The next thing I knew, we had moved far down river and were wading knee-deep in mud. "Hey, here's a footprint of ours from last week, wow," exclaims Therese. "Look, an island," calls Emile from a rock. Meanwhile, Therese has discovered a tributary she's never noticed before. "Yuk, a dead sucker," shouts Emile inspecting it from as close as his nose will allow him. This run of activities is finally broken as Therese's elder sister calls her home for a household errand. On noticing a birch

tree on the bank, Emile decided to shin up it; this is too much for me to follow. For the first time, in however long since entering through Emile's gate, I'm reminded of the purpose for my being here. Oh no, my log book must be at least a mile back downstream! Chuckling to myself I lie back on the grassy bank to observe my arboreal friend, now 15 feet up in the blue.



PLATE IX

"Much of the time children adapt places for use around their homes in very different ways from those which they were designed for and used by adults." Boys setting up a string pulley in the tree above their lean-to.

CHAPTER VII. Place-Use

Monday, August 7th--Light rain: Four of the boys of Greenlawns Hill are playing baseball in the Glenn family's two-car garage. With little effort they have miniaturized the game. A snow brush serves as a bat, and it is used with a plastic ball, thereby reducing the scale of the game. The top of the garage door has become a home-run and various windowsills and garden implements have taken on new significance as markers. In this way the 20-foot square garage has become such a satisfactory ballfield that after an hour when I pointed out the rain had stopped, two of the four boys wished to continue playing indoors rather than utilize their well-layed-out ballfield behind the house.

It has already been shown that most of elementary school children's play occurs within a few hundred yards of the children's homes (Chapter IV). Much of the time children adapt places around these homes for use in very different ways from those which they were designed for and used by adults. Therefore, in order for adults to understand the play environment available to any group of children, they must re-map that environment with the children as their guide. To do this in a systematic manner it would probably be best to develop a place taxonomy through the use of a linguistic methodology. At the time of designing this investigation I was unable to discover a suitable ready-made system and it was not possible in this holistic research program to spend undue amounts of time developing highly sophisticated techniques for specific parts of the study (1). Consequently, the procedures adopted were developed from the more traditional tools of the ethnographer: interviews and observation, together with diaries maintained by the sample population of children. This chapter presents aggregate data on the most frequently used children's places. As such, it serves as a context for the detailed maps and descriptions of children's place-use in the Family Studies discussions (Chapters VIII and IX).

Procedures

Systematic observation has been the method used by the various planning agencies who have studied children's place-use (Appendix A-4). This investigation could not compete with the massive sample sizes of these observational studies. In order to improve the manpower situation, I attempted

1 An ethno-linguistic approach of the kind developed by Conklin (1962) in his investigation of the plant taxonomies of different cultures would have been suitable but the complex and cumbersome development of a suitable technique lay well beyond the resources of this investigation. The methodological problem remains a challenge for the future development of comparative research on children's relationship to their environments.

during the first winter of study to work with the senior high school class on this aspect of the research. I devised a standard route which enabled survey of the entire town, and then further divided the town into five sections. The 10 volunteers interested in the study were to walk these sections, one boy-girl couple per section, and to record the name, location and activity of each child observed. The plan was to observe for one week in each of the four seasons, beginning in December. However, after two days of walking in the cold, the students were rapidly becoming discouraged as they discovered that their entire survey route revealed a maximum of only one or two children. I decided to relieve this frustrated group of their promised assistance before destroying their budding interests in college and research.

I too found these systematic survey tours of limited utility for the amount of time consumed. I therefore decided to do just one week of observations for the winter and one for the summer. At the same time, I decided to make one weekday after-school tour and one Saturday afternoon complete tour in each week throughout the year. These tours were of a more informal nature. They enabled me to stop and chat, and to pursue observations in detail when they were of special interest. While I cannot claim that the tours produced data as systematically as the survey, they nevertheless insured that for at least twice a week, there was an equal opportunity for children in all parts of the town to be observed and their locations and activities entered into my log. I also learned much about children's place-use from various methods discussed in detail under other chapters: the geographic diaries, the place familiarity exercise, and the place preference interviews. The results of all of these approaches are incorporated in each of the following sections.

Land-Use Surveys

Purpose:

To ascertain children's land-use as it varies with the season, by age and by sex (1).

Data Collection:

A standard route was devised which enabled a visual survey of the entire town. My aborted attempt to work with 10 high-school students has already been described above. When I continued my winter observations in the first week of February, I did so alone and by car. By driving very slowly and extending my observations with binoculars from specific locations on each of the four hills (to reveal otherwise "hidden areas"), I was able to make a comprehensive visual survey of the town in a period which varied be-

1 "Land-use" is used in distinction to "place-use" to refer to the naive recording of children's activities on the landscape according to their location and without regard for any descriptions children themselves might have for places and for associated activities.

tween 45 minutes and one hour and a half. The route taken and the sequence and direction of my visual scans were carefully prescribed on a map to avoid any bias that might otherwise result from scanning some places more than once. On those occasions when I could not identify the children by name I would make a written description of them and investigate their identity at a later date.

Data Analysis:

No valid information could be obtained concerning the nature of children's activities because they were observed from variable distances and because the children were not asked what they were doing. It is my opinion that this has been an invalid aspect of past research (Appendix A-4). The method's value is simply that it provides accurate information on the location of children's activities. One can also ascertain the children's sex and at least their approximate age. By simply plotting the locations, it is possible to construct a reasonably accurate map of the locations of children at any one period. In order to provide a sufficiently large number of children to reveal patterns in the distribution of children's land-use, however, it was necessary to map the data from an entire week of each season.

Problems with the Method:

A number of major weaknesses were found with this method. The primary problems in previous observational studies of children's use of the outdoor environment were that children's identity was never known, and age was approximated. In this study, both of these problems were obviated because I had the opportunity to become familiar with the children. Other anticipated problems could not be entirely avoided. First, children cannot be seen when playing in the woods and may occasionally be missed when playing behind, or in the shadow of houses and other buildings. Second, it is impossible to say with any degree of certainty what the children are doing when one is observing them from variable distances and one cannot stop to ask them without invalidating the systematic sequence and timing of the survey route.

Geographic Diaries

Purpose:

In addition to the purpose described under "Spatial Activity" (above), it was hoped that the diaries would provide valuable information on children's place-use in children's terms.

Data Collection:

Described under "Procedures," in "Spatial Activity" (Chapter IV).

Data Analysis:

All places described by the children in their diaries were recorded in frequency tables. These were summarized by sorting them into three of the four categories previously utilized with the place preference data: land-use places, social places, and commercial places. This enabled comparison of the data in terms of the sex and age of children. If children mentioned any land-use in association with a visit to a child's home, it was entered under both the "land-use" and "social" category. If no such information was provided, the place was transcribed as a "social" place only.

Problems with the Method:

Because different children showed different degrees of interest in working with the diaries, the information varies in the degree of detail.

Informal Observations (Log Records)

A considerable amount of information would be missed if I relied only upon systematic observational methods (the land-use surveys), and interviews (the diaries). First of all, the detail of place-use could not be recorded by either method. It is frequently impossible for another person to know, through observation alone, what part of an environment a child is engaging with. It is also highly unlikely that a child will identify and elaborate these environmental qualities during a relatively informal interview. For this reason, discussion of the fine detail of place-use is reserved for "The Family Studies" (Chapters VIII and IX). A second problem is that places hidden from view go unnoticed during observational surveys. While such places were sometimes mentioned in the diaries (e.g. behind houses), places that were used infrequently (e.g. the woods) are often excluded. Frequency of use cannot be taken as the only indicator of what places are important to a child. Some infrequently used places such as the woods may be extremely important to a child. Also, because the diary records cannot record length of stay at any one place, they perhaps introduce a bias in favor of mentioning more frequently local places, rather than the distant places a child might be more likely to make fewer, but more prolonged visits to since they are further away from the home.

In view of these weaknesses, I have extracted the data from all of the less formal surveys and observations recorded in my logs in order to draw a more comprehensive place-use map (Figure 7-3). The information may be a little biased towards those children with whom I worked most closely, but because these children were consciously drawn from all over the town, any such distortions are minimal. Any place used by the children of three or more families is recorded on this map.

Findings

Land-Use

The winter land-use survey revealed very little outdoor play in comparison to the summer survey (Map Figures 7-1 and 7-2). In part this may be explained by the greater amount of out-of-town recreational activity in the winter, as the children visit the various ski centers south of the town. But undoubtedly, the cold is the major reason for the lack of outdoor play. Similar observations have been made by Swedish studies and a direct correspondence has been found between the amount of outdoor play and the wind and temperature conditions (Morville, 1969; reviewed in Appendix A-4).

A more surprising feature of these maps is the very low proportion of pre-school aged children (six years or under) observed playing out-of-doors, even though there is a larger population of children of this age group than in the seven to nine-year-old and 10 to 12 year-old age groups. This may be partly accounted for by a systematic weakness of the methodology. The pre-school children observed are found playing very close to their homes. This age group would, therefore, be particularly susceptible to the methodological flaw of not being able to see behind all of the homes. Nevertheless, there were so few observations (none during the winter) that the question arises as to whether these pre-school children spend less time out-of-doors than do children over seven years of age. Perhaps during the winter this is related to the greater amount of time and trouble some parents find in dressing and undressing these young children. It has already been noted that pre-school children play very close to their homes, but an important difference between the winter and summer observations is that all children's winter play takes place relatively close to home. In only two cases were the children more than about 200 yards from their home; both of these were older boys on snowmobiles. In contrast, just a visual scan of the summer land-use survey map shows the large proportion of children on the streets, sidewalks and the ballfield downtown. A closer look at the raw data reveals that in over 60 percent of the summer land-use observations, children were found to be playing more than 200 yards from the front or back door of their home.

Finally, in comparing the winter and summer land-use surveys, it must be noted that no large groups of children were observed during the winter. The largest group of pre-school children observed is two, compared to numerous groups of five or six children in the summer period. Groups of more than two children were mostly made of the older age group (i.e., seven years or older). This might be seen to conform with Gesell's observations that pre-school children do not engage in group play, but we might just as easily suggest that because of their limited range of free movement, these children cannot by their own volition come together easily with children of a similar age. No doubt both factors help explain why it is that the pre-school children were almost always observed isolated from the larger groups of children.

Since the children's actual activities could not be recorded with any accuracy, few statements can be made regarding differences in the land-use activities of girls and boys. During the summer the numbers of observations are approximately equivalent: 80 girls and 96 boys. However, the

FIGURE 7-1: LAND-USE (winter 1)

BOYS	GIRLS	GRADE LEVEL
▲	●	4th - 6th
▣	◻	1st - 3rd
⊙	⊙	≤ Kindergarten

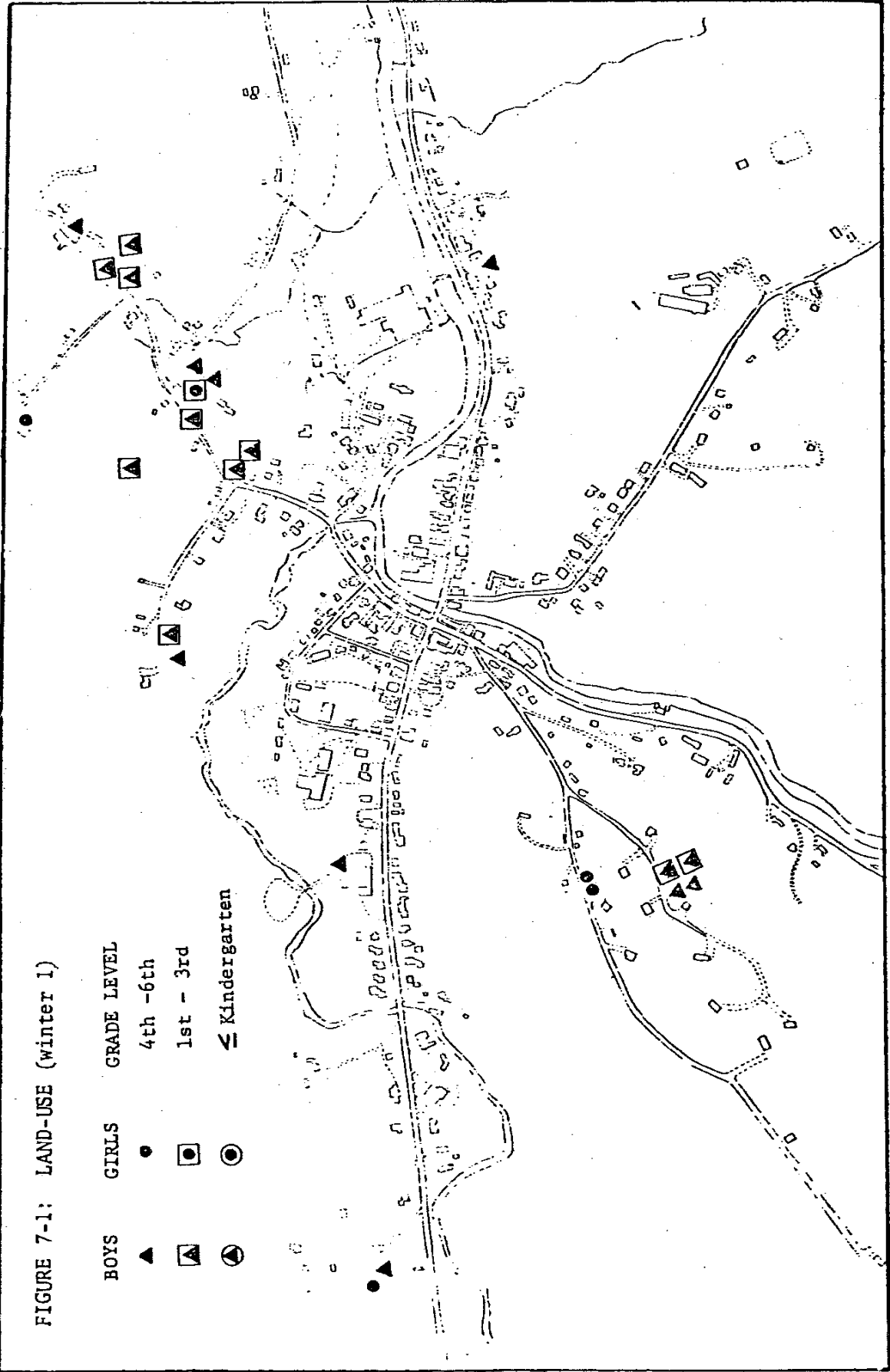
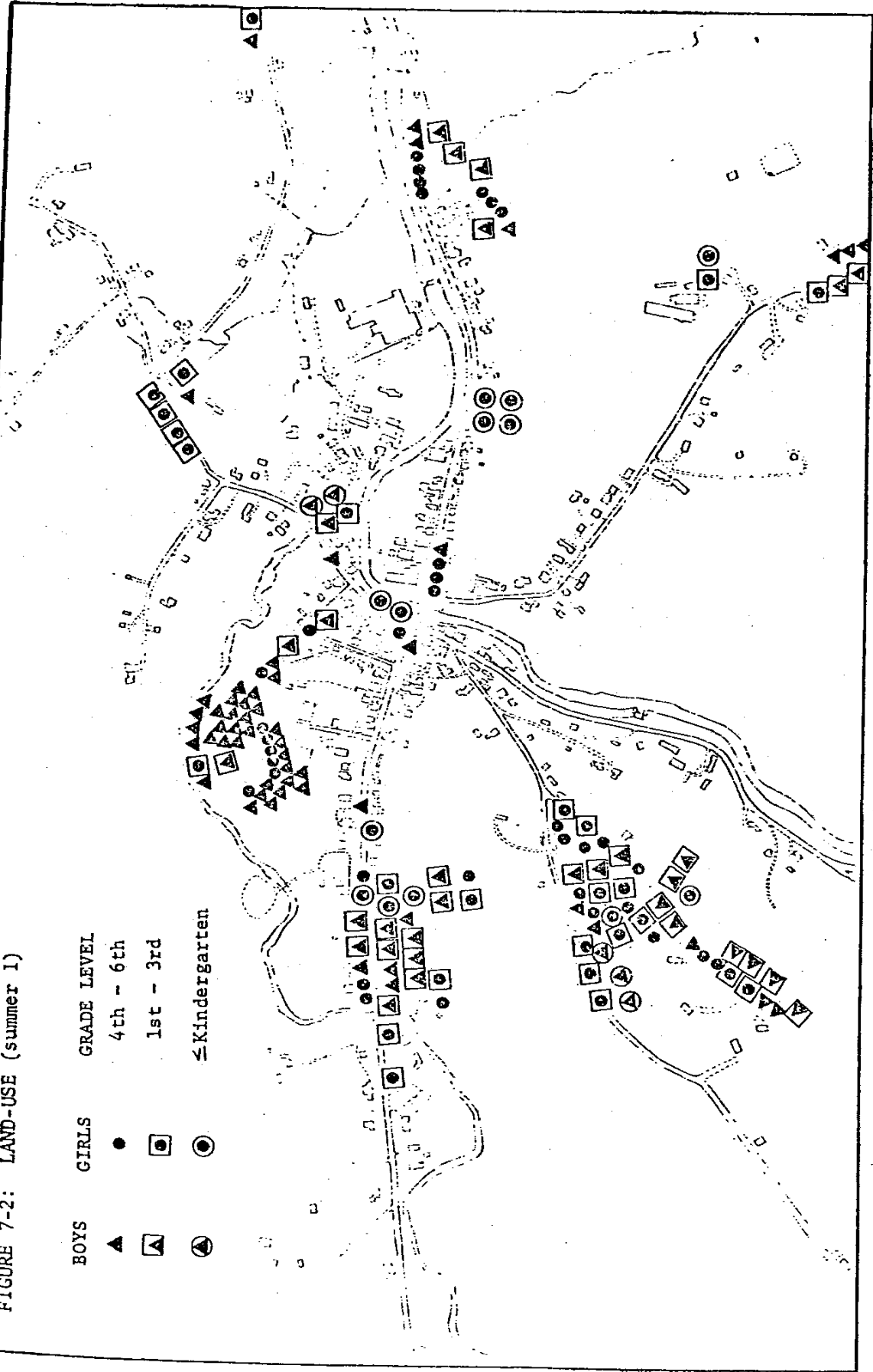


FIGURE 7-2: LAND-USE (summer 1)

BOYS	GIRLS	GRADE LEVEL
▲	●	4th - 6th
▴	◻	1st - 3rd
⊙	⊙	≤ Kindergarten



winter ratio of 19 boys to five girls leads one to ask whether or not girls are more discouraged by their parents from playing outside in the winter than are boys.

Summer Land-Use Patterns

The largest cluster of observations made during the summer were at the ballfield. Almost all of these are boys aged nine years or older. The most frequent activity is baseball, but eight observations were of cycling and mini-bike riding around the edge of the field, particularly along the challenging "bike track" alongside the river. In addition to the ball play, 12 children, five of them girls, were recorded on top of the grass bank near the High School observing the ball play. The other two major summer clusters were found, not surprisingly, where the two large groups of children live (Figure 3-6, "Location of Children's Homes").

It is interesting to note how, throughout the town, children were found playing in front or at the sides of houses rather than to the rear. This observation must of course be qualified somewhat because of the impossibility of having full view of the rear of the houses (discussed in "Procedures"). Why they prefer to play in front when there are equivalent landscape qualities in the rear of their home, the children have no difficulty explaining. Generally they say there is more going on out front. They can see the action. Also, they, in turn, can be seen by other children. Potential playmates are an important resource in a small town.

Only four observations were made of children cycling on any of the four major streets; all four were boys of fourth, fifth and sixth grade. The busiest cycling area in town, according to this map, and from informal observations, is on Greenlawns Hill Road. This accords with the earlier discussion of parental range restrictions as they vary environmentally (Chapter IV).

Winter Land-Use Patterns

The summer tendency for children to play in the front or sides of their homes was not repeated during the winter. This is because the most frequent winter outdoor activities, skiing, tobogganing, and snowmobiling, depend upon the hill slopes or large spaces which are behind the houses. Fifty percent of the winter observations are of these categories. In addition, there are so few children around and so little going on that the summer reasons for being "out front" in preference to "out back" are lost in the wintertime. Most of the remainder of the activities observed are of children making snow structures, an activity largely determined by the location of snowdrifts and snowbanks made by ploughs.

Age- and Sex-Related Differences in Land-Use (Diaries and Log Records)

Some specific information may be extracted from the week and weekend geographic diaries (Tables B-17 and B-18). This data supports the tendencies noted in the land-use surveys and offers some interesting addi-

tional information. The detailed log records are used to amplify the more systematic, but thin, diary data.

Rivers and lakes are both visited more frequently by the older children (Appendix B, Table B-17), though they were amongst the most preferred places in town for children of all ages. Only the boys of fifth and sixth grade have access to lakes without parents' accompaniment. Except for these boys and three families who have their own pools, children can only swim when taken to a lake by parents.

During the first summer, I noticed very few girls fishing. The boys, commonly in pairs, but often alone, choose places usually not too far from their home and in a location known by the mother. In addition, I noted that the site quality of relatively deep water, offering easy casting, is most important in influencing their choice, but whatever their places are, the children each claim to have the best spot. The bridge in the center of the town is the most popular fishing spot because it has the additional quality of being visible to others. Children of fifth grade level and older, fish here, both from the bridge, and from the concrete walkway beneath it. For some reason, during the second summer, sixth and fifth-grade girls began fishing from this bridge. So successful was one of the girls, that a number of boys were deterred from fishing there for fear of being shown up by her. This was the same class of girls who that summer had pushed to make Little League an activity for girls as well as for boys. At this location, social interaction is at least as important as catching fish. The West River Bridge is also a popular location, but the water is too shallow for fishing. This location is, however, superb for dabbling, throwing stones, making dams, and catching tiddlers by hand. Both locations are known by parents to be highly valued and are subject to strong restrictions. Most of my observations of children breaking range rules and being punished, were in relation to these two rivers. The ballfield is also used more by the older children. Concurrent with this increase in the use of places further away from their homes, as the children grow older, the diaries suggest a decrease in the use of places around the homes (see categories: "outside home," driveways, sand-piles, swing sets, forts, and climbing trees, of Table B-17).

One notable exception to the decrease in the use of the home environment, is the increase in the the use of lawns and fields for organized games. This is of course partly related to the general increased interest by children over third-grade level (nine years) in organized games. The question arises as to why the town ballfield is not used for this purpose. A number of reasons may be offered. For most of the boys and almost all of the girls, the ballfield may only be visited "with permission." For some parents this requires that there be an "event" to go to. Little League games and practices constitute an event. Informal gatherings by the children themselves seem to be very hard for them to organize. For most girls, and for boys of third grade and younger, visits may be made to the ballfield only with an adult, or occasionally with an older sibling. This occurs once a week during the summer when their parents allow them, and commonly accompany them to a Little League game. High-school games (baseball, soccer, and hockey) are observed by adults in the late afternoons throughout the spring, summer and fall, and elementary schoolchildren come with them in their cars whenever they can.

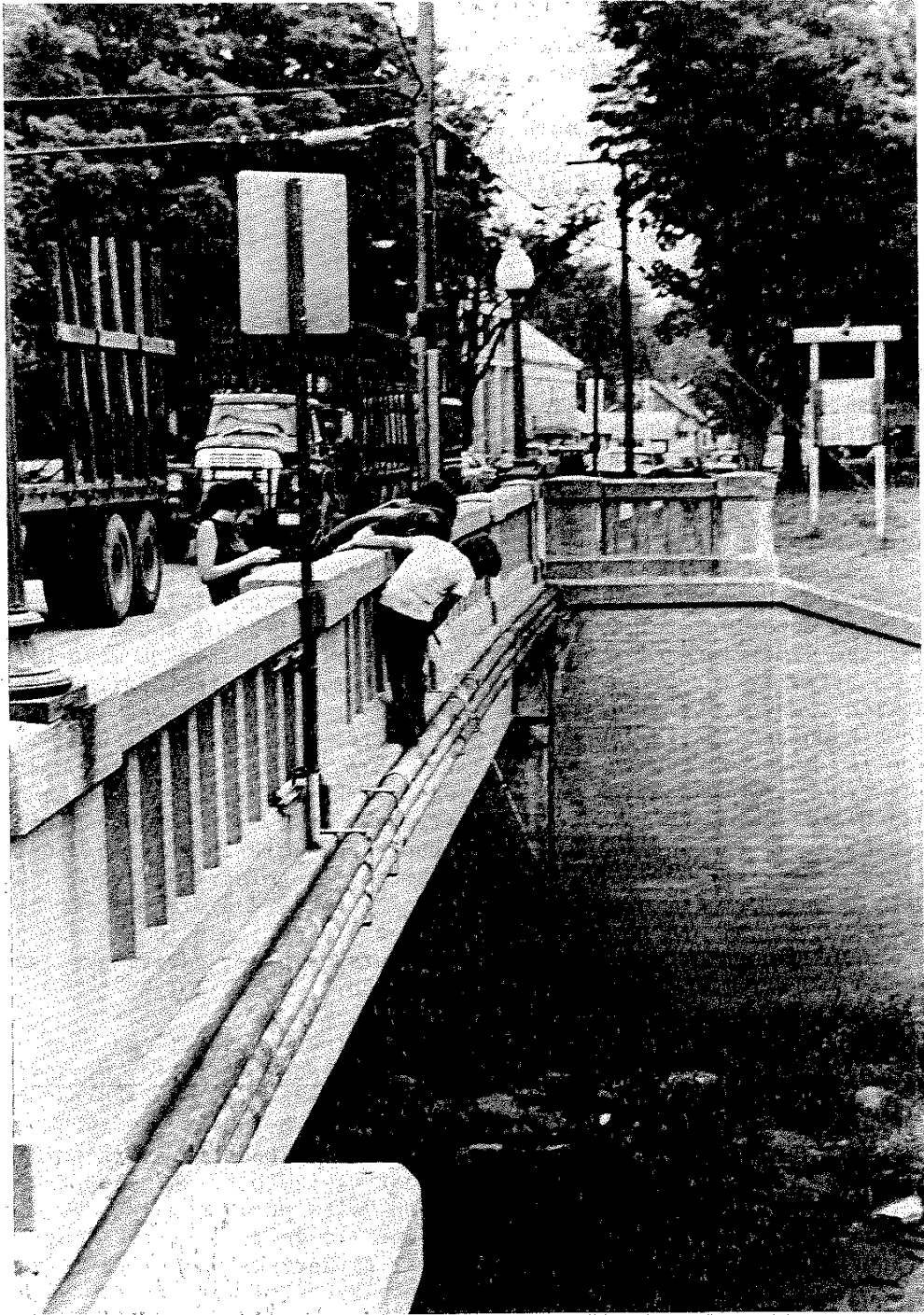


PLATE X

"The bridge in the center of town is the most popular fishing spot because it has the additional quality of being visible to others."

Some boys of the fourth-grade and older visit the field to ride their bikes and mini-bikes, or, more often, just "to see what's happening." But for most children, they need the excuse of an "event" to obtain permission to visit the ballfield. Only the boys of North Hill are able to get such child-generated events organized. For these boys, the ballfield is sufficiently close for parental permission not to be a barrier; the boys are within a few minutes walking distance of each others' homes; and there is a sufficient number of boys over nine years of age to provide a critical mass to constitute a game. The smaller spatial ranges and related constraints on social interactions among girls has already been discussed at length (Chapter IV). This spatial freedom and access for the North Hill boys enables a group of four or five to gather without the elaborate planning that only adults seem interested in making.

For comparison, the Main Street children have no critical mass of older children, while Plum Hill children suffer both a lack of critical mass of children and a prohibitive distance from the ballfield. The Greenlawns Hill group of older children suffer both from distance as well as from the social isolation of relatively small parentally-defined ranges, but because these children have large flat, grassy spaces around their homes, they find no difficulty in generating the idea of a game and beginning it immediately.

Specific indication of some of the children's frustrated desires to use the town center ballfield comes from again comparing the place preference table with the diary land-use data (Tables B-15 and B-17). From these, it may be seen that although most children's ballfields at home were frequently used places during the week of diary-keeping (23 times), this category of place lies much further down the list of favorite places, with only 13 children choosing this category compared to the 41 who selected the town center ballfield. Nevertheless, the children do rely on these fields around their homes for most of their games. The most popular organized games in this town are kickball, softball, baseball, and tag in its multiple variations. Tag is easily played anywhere. The ball games present more problems. But the children in other parts of town occasionally manage to play the ball games in spite of the small number of players available and the environmental restrictions.

The West Main Street group finds it impossible, though they often try, to play on their front lawns where even kickball is hazardous due to the traffic. These attempts quickly result in well-deserved adult admonishment or with the children's frustration with the restricted space. These same children speak with pride about their "ballfield" at the top of the hill behind their homes. During their first exploration of the hill, in Spring of 1971, this group of children found a flat clearing at the top. They determined then to play a game of baseball. They returned to play on two subsequent occasions during the summer. On their third visit, they found it necessary to stomp the grass down, and even then, the ball was easily lost. And so, though the field has entered their consensual place vocabulary as their "baseball field" and though they speak of it with pride to other children, it has never again been used as such. In addition to its unsuitable vegetation and topographic qualities, the hill is beyond easy access to the children's homes, and, more important, it is beyond the view of other potential playmates. The older children depend upon younger children to boost

the size of their teams. But the younger children (under fourth grade) seem to want to be able to drop out frequently from the activities, to get a drink, go to the bathroom, or perhaps just for a change of activity. Consequently, the games have very fluid team members, and cannot be played more than a few hundred yards away from home, unless all of the children involved are nine years of age or older.

The only other ballfield used by the children of three or more families in the town is the flat lawn area behind the houses of West Main Street (Map Figure 7-3). Because there are only two boys, games depend upon the will of the five girls living there. The two elementary school age boys usually have to wait for family parties and picnics for the rare opportunity of a game to arise.

Games are ingeniously modified to meet the particular social and environmental circumstances. Greenlawns Hill children have the greatest choice of ball play places. They alter the location depending upon who and how many are playing, and in accordance with the weather, an example of which was given in the introduction to this chapter. If they can, the older boys organize a full-scale game on their "ballfield" and the younger children get little opportunity to participate for more than a few seconds. If there are only a few children available these older boys will sometimes refuse to play, but will occasionally "lower" themselves to play a younger children's game such as wiffleball or kickball on one of any of the front lawns. The groups for this game may sometimes be as small as three children. The older girls are much more willing to play with the younger children: they demonstrate a greater tolerance for the limited understanding and physical abilities of their juniors. How much this is a result of being left home with them more and learning to cooperate in play through necessity, and how much it is due to the direct effect of mothers' training them to care for the children, could not, of course, be determined.

The land-use data from the week diaries (Table B-17) support the findings reported under "Spatial Activity," about the more restricted use of bicycles by girls. Forty-four of the diary entries by the boys refer to cycling, compared to 13 entries by the girls. Of these, only eight entries are made by children of the younger age group (six by boys and two by girls). Only in the Universal Supermarket parking lot is there more cycling by girls than by boys. For children under eight years of age, front driveways and sidewalks are most heavily used for trikes. School Street is sufficiently free of through traffic, in easy access of parents, and close to areas of activity (the ballfield, town garage, fire and police stations), and so it has become over the years an acceptable area for "cycling around." Even children younger than eight years of age living on this street and Field Lane, are allowed to cycle and allowed to cycle around.

It is through "cycling around" that the older boys chance to fall into games with each other. It has already been documented how rare is such freedom among the girls. With younger boys this might be limited to their own street. Boys 10 years or older, hunting for some interesting activity will commonly begin by cycling around the School Street block. If this doesn't work, they may visit some particular child, or go to the store in the center of the "downstreet" intersection which is used as a collecting

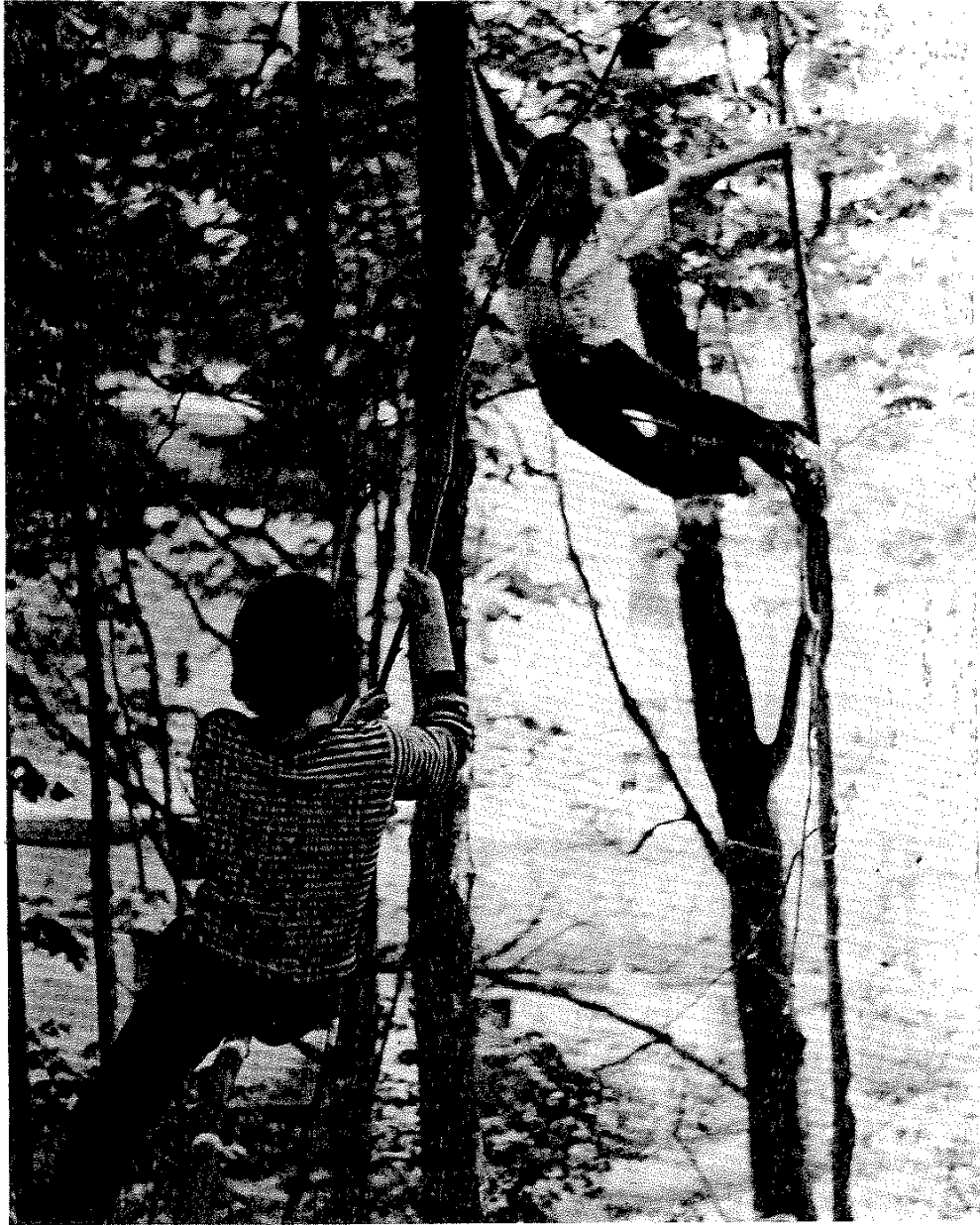


PLATE XI

"These wonderful 'elevator' trees had white painted bands around them . . . An elegant return to the ground was simply achieved by climbing to a suitable height while holding with one hand onto a neighboring tree, and then swinging down while holding onto the graciously bending 'elevator'."

and refreshment point for boys interested in group activity. Here a boy will buy a soda, and sit on the wooden front porch which is ideally suited for this purpose, until someone or something happens along. Girls are very rarely seen at this central spot. Unlike many of the town's teenage boys who "hang out" here, these 10 to 12 year-olds do not stay around all day. They do not seem to have any interest in sitting there all day, just watching or talking, but rather, use this location as a starting point for other activities. These patterns of activity are of course limited to spring, summer and fall. During the winter, there is almost no child-generated group activity. The children are totally dependent upon organization by the schools, scouts, 4-H clubs, church, ski clubs, and their own parents.

The relatively traffic free area of School Street and Field Lane is the favorite location for street games. The only other street used by children is the Greenlawns Hill Road, used for cycling. School Street and Field Lane are different. They have a dense association of buildings which makes them ideal for street games such as "skip," a sophisticated hide-and-seek game in which children hide out in all kinds of strange and forbidden places. These games are played during summer evenings until dusk turns to night. They are largely limited to children of fifth-grade level and older. The common collecting area and focal point of such games is the statue on the front library lawn. This same statue is used during the daytime as the focus for similar games, but of more local extent, by younger children. The shadows of dusk and the absence of adults enables the older children to play "skip" with a mixture of daring and adventure.

Climbing trees are valued from an early age. In addition to their climbing qualities, trees also were identified by the children in terms of the fruit they provide and the shade they offer. In describing trees, these qualities are used to differentiate one from another, although a few children learn the proper names of trees within their home grounds from their parents. But, most important, trees are loved and differentiated for their climbing qualities; they offer a range of climbing opportunities to challenge any child from about five years of age and older at a scale and complexity which he or she may select. In Inavale they are located around every child's home. It was clear in the place preference data how much more valuable trees were to the children than any play equipment.

I learned that children throughout the town developed strong affections for particular trees. This was clear from the place expeditions but it came to me more vividly as I saw children returning repeatedly to the same tree during my two years in the town. Joe (7), of North Hill Road, explained to me during the place expeditions that he valued the birch tree in front of his house because there were many different ways up it. He explained that he had been able to climb it when he was "just a baby" but that it had grown and he could still find difficult ways to go up it. He explained: "I like to climb up it and look out at spaces because it's high." (RH: "At spaces?") "Yeah, it's like a lookout tower." He prefers the black maple in the back of the house now, he explains, "because it's higher, but I can only climb it when I put the table under it first." His affection for both trees, but especially for the birch tree was clear. His mother and father explained to me during my interview with them that of all places outside of his bedroom, the birch tree was the place he most considered to be his own. They

also commented on how he values the tree in the rear of the house but noted that he preferred the birch tree because he likes to "see the action" and from this tree he can "see what is happening in the street."

Trees are also highly valued by children for their suitability for tree houses. Maples, birches, apple trees and lilac bushes all have their different merits, as is illustrated in "The Family Studies." What is more remarkable is how much children, especially those under nine years of age, choose to play in the dirt beneath large trees. A few older children mentioned the shade-giving properties of trees but there is at least one other important factor. Beneath the trees, children commonly find an area of dirt where their parents have been unable to get their lawn to take hold. Here, in the shade of a large canopy of leaves, they dig up dirt to make miniature landscapes which may occupy them for hours at a time. Again, this activity is best understood by reading "The Family Studies" (Chapters VIII and IX).

All of these qualities make trees a most important resource for children. This should be recognized by the environmental design professions. An important issue for designers and planners is of course tree damage. Even in this small town children occasionally damage trees and bushes in their play (see Chapter IX). Trees differ in their durability for play and this is another small piece of practical research that the design and planning professions might consider. Elementary school education could also help by including tree care as part of its environmental curricula.

There are countless other climbing places throughout the town. They offer seemingly trivial challenges which, are however, of great importance to individual children. They select them out as places to exercise their developing physical skills and to demonstrate to themselves, and sometimes to others, their competence. During the "place preference" interview, for example, one eight-year-old boy selected a statue in front of the library which he likes to climb. Like the sliding places, these play elements are frequently changed or approached in different ways to offer more interesting and challenging opportunities for interaction as the child develops. The important principle for designers to note here is that it is children themselves who are choosing from a rich complexity of alternatives which they think they can handle.

Particularly exciting climbing places can be found in the two sand quarries in town. One of these, behind the supermarket, is known by all of the children and used by many of them in spite of warnings by the police and parents. Only after a boy from out of town was buried by climbing there, during my second August in the town, did the children completely give up this challenge. Another exciting climbing and jumping place, which is widely known and used, is the town garage sandpile. Running up the back slope and leaping off the steep front slope commonly carries the added exciting quality of being subject to admonishment by the town garage workers if caught in the act. The game is made more exciting by doing "flying angels" and "somersaults."

The large number of surveys of children's play seem to have ignored these activities in which children are resting, watching, or dabbling by themselves in a quiet, seemingly introspective manner. Such activity is

commonly recorded as "passive" by observational studies. But, without doubt, the children are active and certain place qualities seem to be associated with this kind of activity. They can only be dealt with in suitable detail in the "Family Studies," but two simple generalizations might be made. First, these places are usually quiet, and second, they usually have water, dirt, sand or some other simply manipulable material close at hand. Activities which adults might only describe as "dabbling" or "fiddling" and dismissed as having no "function," may well be extremely important fluid experiential activities. By fluid I wish to suggest that this day-dreaming-like, seemingly purposeless activity, probably has some most important "inner" value of the kind described by Edith Cobb (Appendix A). For example, it is for dabbling that "froggy ponds" are so highly valued, not as one might think, solely as a resource center for frogs. Although the frog ponds are usually used by children when alone, they are so popular that the same special or secret pond or stretch of brook is commonly shared at different times by different children.

I was struck by the large amount of time children spend modifying the landscape in order to make places for themselves and for their play. Because I consider this making of place a particularly important aspect of children's place experience and one which has not been recognized in previous surveys of children's play, I consider it worthy of discussion under a separate heading.

Landscape Modification

Children spend a large amount of time making places. Map Figure 7-5 shows those I found which were made by children of 12 years of age or under during one year, for the winter period (when the ground was covered in snow). Map Figure 7-4 locates all of the structures built during the remaining months. Many places and objects made by children are not recorded at all; they are often so transitory in nature that one has to be in the place at the moment of construction to be able to record them. This is particularly so with the places "built" by children younger than eight years, which are scarcely physically modified at all; most of the manipulation of space into place being of an imaginative kind. Even some places described to me by children cannot be mapped, because I could not find them "in the field," and hence, I can neither locate them on the map or describe them. This emphasis upon enduring artifacts, therefore, results in an under-representation in the number of places built by younger children.

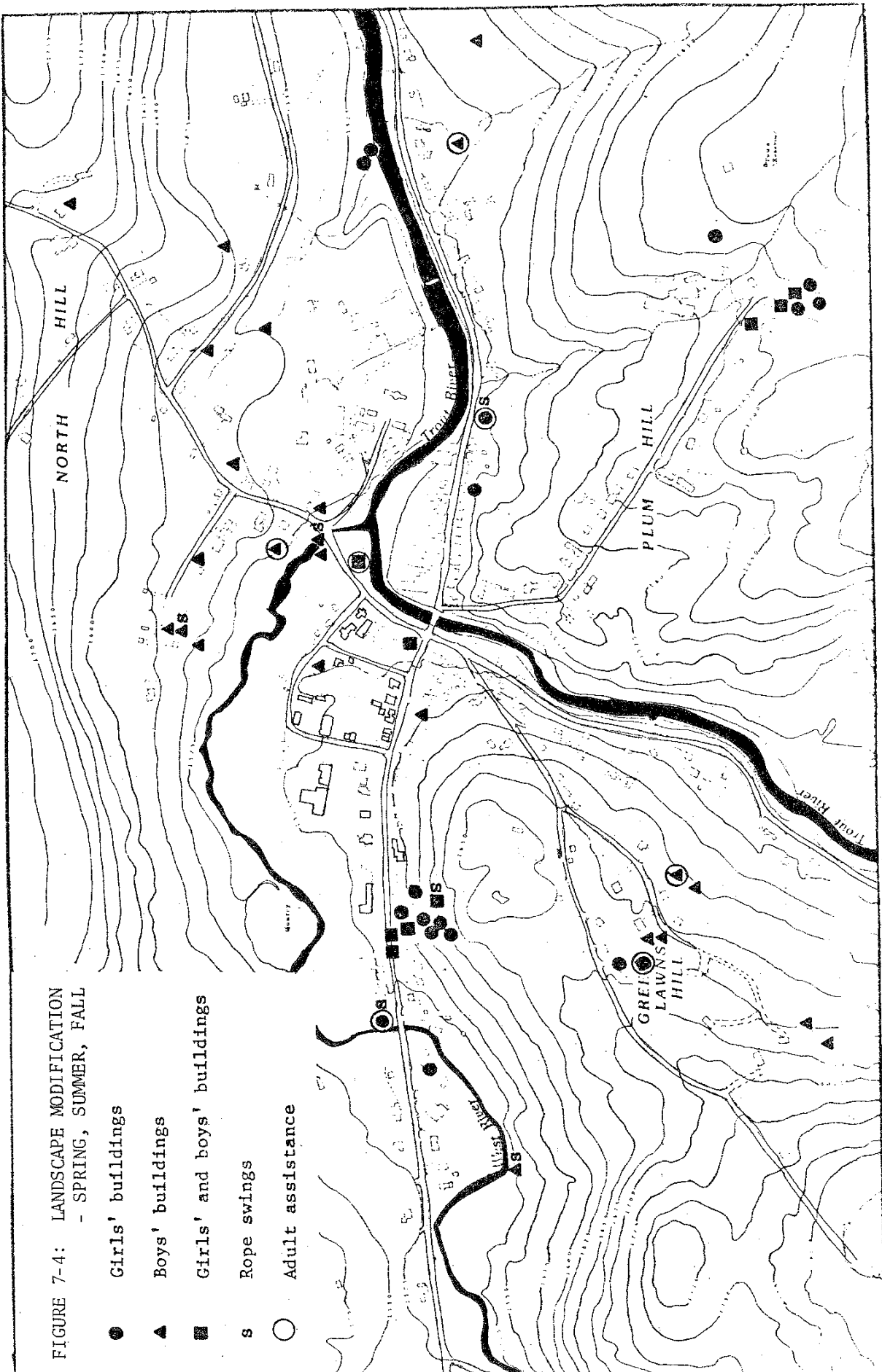
Building--Summer, Spring and Fall

Location

The clustered distribution of children's buildings on Map Figure 7-4 is best understood by comparing it with the map showing the location of children's homes (Map Figure 3-6). The relationship between these two distributions is a reflection of children's decisions to locate their buildings close to their homes, usually within 100 yards of the house. Because many of these locations were discovered through my observations, and because I

FIGURE 7-4: LANDSCAPE MODIFICATION
 - SPRING, SUMMER, FALL

- Girls' buildings
- ▲ Boys' buildings
- Girls' and boys' buildings
- s Rope swings
- Adult assistance



spent more time immediately around the children's homes, this may have introduced some small bias. This is not likely to be a large bias because, of all the buildings shown to me by the children, the furthest is approximately 400 yards from the home of the nearest of its three builders.

Another almost universal location characteristic is the construction of the buildings in the rear of the dwellings. There seem to be two factors influencing this. Perhaps most importantly, it is in the rear of the homes where the most suitable landscape qualities and usable "loose parts" may be found; in contrast, the fronts of houses are commonly carpeted with lawns and devoid of all but decorative elements (1). Related to this first point, most adults are very protective of the aesthetic properties of the front side of their homes and do not wish them despoiled by what they consider to be very ugly children's structures and loose objects (for example, the front lawns of Greenlawns Hill).

Site Qualities

Many different types of elements are used in children's making of places: trees, bushes, long grass, cut grass, fallen leaves, large boxes, scrap lumber, etc. It is noteworthy that in Inavale, the large majority of the children's structures use "natural" elements for the basic structure of their places.

The most frequently used elements are trees and bushes. One child explained to me that a "tree fort" is up in a tree, whereas a "tree house" is built on the ground. This distinction is not held by all children; the terms "fort" and "house" are used interchangeably, except that girls tend to speak somewhat more of "houses" and boys more of "forts." Perhaps this is related to the different roles which are played out in these places. If so, this has been passed down within the language of the boys' subculture, for I saw no use of "forts" as places for defense, or mock battles, except for snow fights during the wintertime. The distinction between those places built among trees on the ground and those built above in the trees, is an important one, for the structural needs of each require completely different trees. In both cases however, deciduous trees are usually used in favor of the dense and dark coniferous woods. The "ground level" tree buildings usually use young straight trees for their structure, whereas "aerial" tree houses are almost always built in mature, well-branching species such as the maple or apple. For the ground level buildings, the numerous thin young "secondary growth" trees offer much opportunity for the children to make a plan form which suits them (usually square), and to tie sheets, or nail boards across these vertical posts. In the aerial buildings, the trees valued are mature and have many lateral branches, ones which will accept planks across the inner elbows of their main limbs. It is because of this requirement that a few tree houses are allowed to be built in the front of homes, where large maples line the roadside.

1 See Nicholson (1971) for a discussion of the value of "loose parts" in children's play.

The most valued bushes for building are those with lush green canopies but with a relatively open network of thin branches beneath, where spaces may be found or made by the children beneath the canopies. Lilacs are most popular for this reason.

The next most frequently used construction materials are discarded loose parts from around the home, such as tables, chairs, prams, trailer tops, old windows and doors. Also, very large boxes, such as those used to carry refrigerators, are very highly valued, especially by young children because they require such little modification. Whenever they become available, they are transported around dozens of locations before being destroyed by rain and heavy use.

I observed other materials being used on a number of different occasions. Tall grass is especially suitable for quickly making places. When associated with lush weeds, very young children find these "jungles" superb for making burrow-like forts that often have the luxury of a roof. Cut grass in the summer and the dried leaves of fall are also wonderful building materials for the younger children.

It is clear from the children's choice of locations that rope swings require the site quality of a moderately shelving bank away from a sturdy tree. For this reason, they are usually built alongside the rivers. Because they depend upon other children, usually high school boys, to set them up, their operation by the elementary school children is subject to considerable fluctuation. Only one was in operation at the time of the interviews and expeditions.

Winter Building

Locations

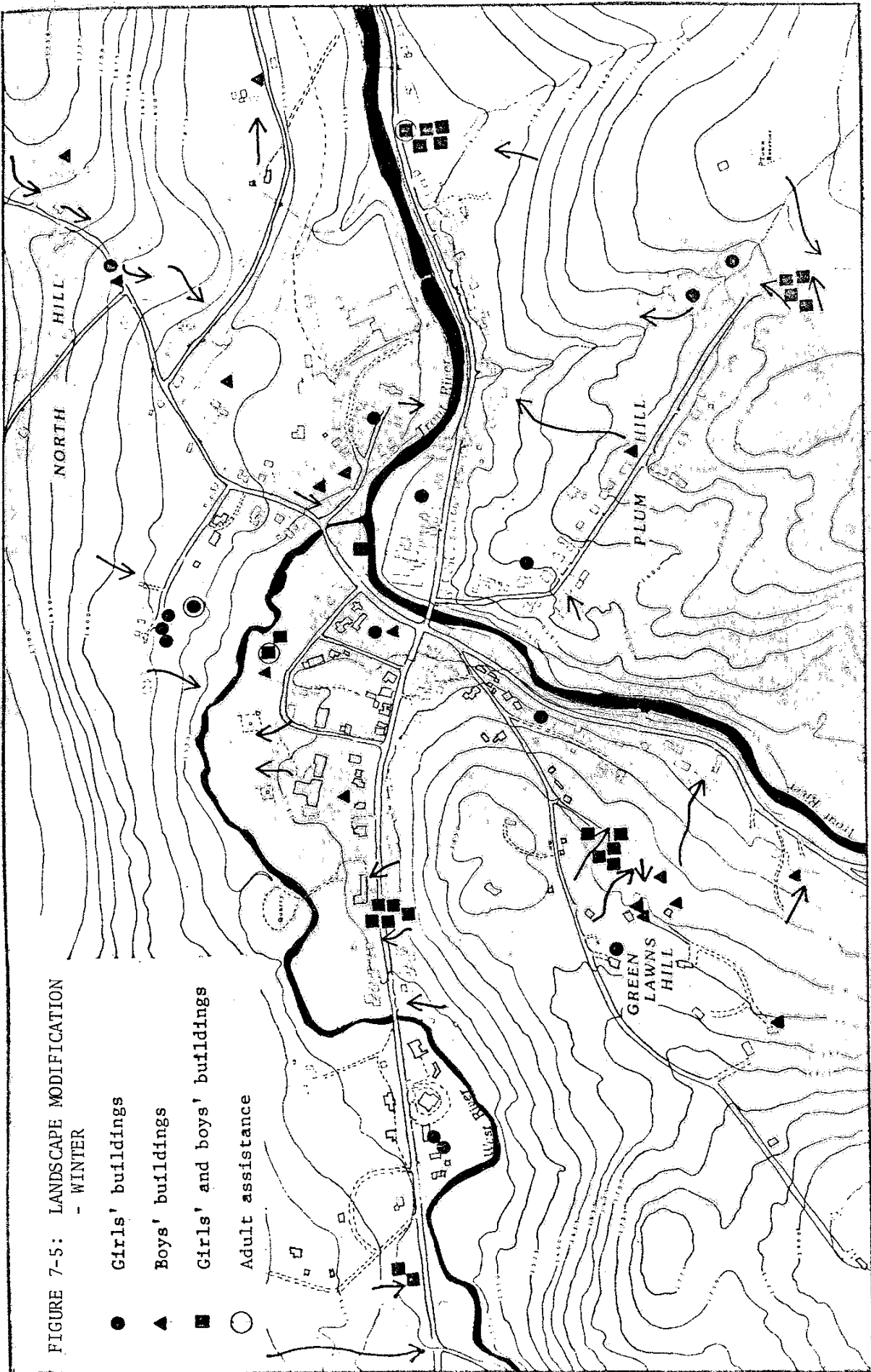
In contrast to the remaining seasons, most winter building occurs in the fronts of the homes (Map Figure 7-5). The snow at this time covers all of the land, and even the previously adult-dominated front territories of certain homes become liberated zones for the children. Also, it is in the fronts of the homes where the road and driveway ploughs make snow banks that are ideal for building purposes. Not surprisingly, in this season, the children's buildings are even closer to the homes, for, as discussed in the previous section, children spend much shorter periods out of doors, travel much less between friends' homes, and play in smaller groups, than they do during the other three seasons.

Site Qualities

Children especially like to build wherever snow has been built up into piles such as beside the roads and driveways where the ploughs create snow banks, or along walls and fences where the snow drifts. They are aware of the different qualities of snow for building and because 1972 and 1973 was a poor winter for packing snow, I often heard the children grumbling about the difficulty of building.

FIGURE 7-5: LANDSCAPE MODIFICATION
- WINTER

- Girls' buildings
- ▲ Boys' buildings
- Girls' and boys' buildings
- Adult assistance



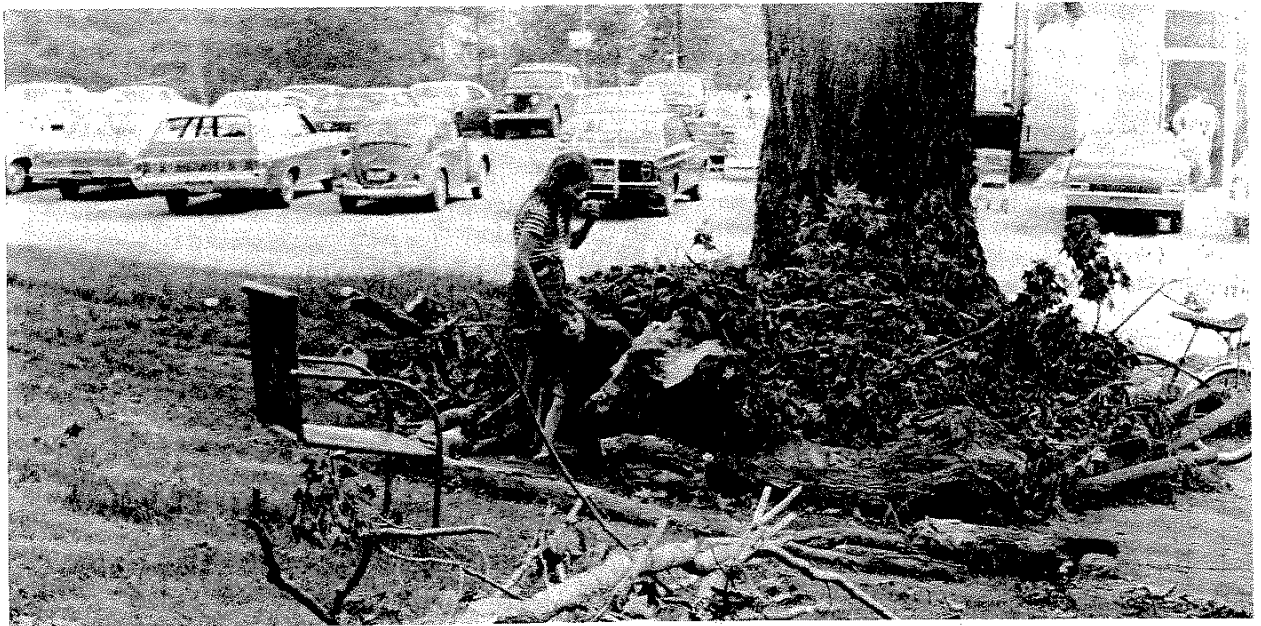


PLATE XII

"Freudian psychologists have 'explained' these so-called cozy places as a desire on the child's part to return to the womb. I believe that there are many other possible explanations."

Developmental and Stylistic Differences in Building

I observed children as young as three years of age finding small spaces in which to sit. Occasionally this might involve turning a box around or closing a cupboard door but this is the limit of their physical manipulation unless an elder sibling (usually a girl) builds a place with them. These places are very often inside the home where there is room for this small scale building activity of infant children, and because they spend more time indoors. Freudian psychologists have "explained" these so-called "cozy places" as a desire on the child's part to return to the womb (Appendix A-4). I believe that there are many other possible explanations. For example these buildings serve excellently as places of retreat, to look out upon the world from a place of one's own, as places for experimenting with how to put things together, and as locales for hide-and-seek with other people or with the environment. In each of these activities a child is probably exploring his or her relationship with the environment, both social and physical.

House building of a more sophisticated kind, where at least a couple of children come together to build some kind of structure, commonly gets underway around eight years of age and continues until the entrance to High School at 12 years of age. After this, such activity is frowned upon by the children's older schoolmates, unless it is a very serious shed-like structure for some particular purpose. Adult assistance usually only comes with aerial "tree houses" for boys and "Wendy Houses" for girls. This seems to be a traditional activity for a father to do with his sons and daughters. Many fathers continue this tradition for boys it seems because they do not want their sons taking risks up in a tree. "Wendy Houses" continue to be built for girls because the fathers generally presume girls to be totally incompetent as builders.

I recorded four kinds of snow structures. The simplest are tunnels. These are dug by children of pre-school age, though sometimes older children make very complex systems of interconnecting tunnels in their snow banks. A second simple approach is to just build walls. These commonly begin with grandiose plans to make an igloo, but with no technical knowledge, they usually finish up simply as walls which may be used for snowball fights for a while, but which quickly fall down. Some older children, with a better grasp of structure, build up their walls while at the same time extracting snow from the interior of their circular structure. They have seen films of Eskimo building and try to copy them. They even pour water over them so that the structure will freeze overnight and be strong, but they always fail to construct a roof from the snow. In two instances during my observations, two groups of fifth- and sixth-grade boys did manage to make a successful roof by placing a plywood sheet across the snow walls and covering it with snow.

Differences Between Girls' and Boys' Building Activities

Girls make places as frequently as boys, but theirs are quite different in structure. Whereas boys concentrate on building structures with walls, and roofs, with little detail in the interior of the places, the girls' emphasis is almost entirely upon interior detail. Also, like younger boys and girls (under eight years), the older girls are much more willing to modify



PLATE XIII

"Whereas boys concentrate on building structures with walls, and roofs, with little detail in the interior of the places, the girls' emphasis is almost entirely upon interior detail."

their places in their imagination. These imagined elements may exist in boys' structures also, but they are not consensual like those of the girls', that is to say, they do not communicate these imagined elements to each other or to me. The girls often name all of these elements for each other. "Paradise" is an example of the kind of creative place-naming I occasionally came across. I accidentally stumbled across this place, built by two girls with the help of their out-of-town boy cousin on my last day in this town. One of the girls quickly sketched a plan for me (Sketch Figure 7-6). The place names are each made up from combinations of the three children's surnames and first names.

Though it was not a formal part of the investigation to work with children who had graduated from elementary school, to enter the High School seventh grade, younger brothers and sisters frequently brought me into contact with these older children. I was surprised to discover that while the boys of seventh and eighth grade still build and occasionally use their "forts," seventh-grade girls very rarely do so. Sixth-grade girls however, often have a "house" hidden away somewhere near their home (Sketch Figure 7-7) (1). These houses differ from those made by younger girls in that they are a little more elaborate, but they also include modification by the imagination, i.e., places named as beds, seats and shelves, etc., without physically changing them. I never saw this type of detailed physical or imaginative modification of place among boys, and no imaginative modification whatsoever by boys older than third-grade level. For boys, building the shell of a house and perhaps furnishing with a bed, seats and shelves for comic books, etc., is everything. Imaginative play and building houses seems to end abruptly for most girls as they entered High School. I suspect it is considered "childish" and unfitting for High School children to engage in such activities, because on a number of occasions I caught them denying that they were interested in the houses when in fact they so clearly were. Examples of this interest are reported in detail in "The Family Studies" (Chapters VIII and IX).

Dirt-Built Places

Throughout the town, usually beneath trees, there are patches of dirt which are very highly valued by boys and girls alike. Here, whether alone or with a friend, children from three years of age to 12, play for hours building miniature landscapes, often to suit their toy cars and trucks. The boys usually build large-scale places such as highway systems, towns, airports or race-tracks. Girls, unless playing with boys, most commonly build houses and decorate the interiors. Also, except for pre-school age children, girls engage in this type of activity less than boys do.

As with the house building, dirt play is suddenly terminated as the children enter High School; it seems that it is considered too childlike by older children and some of their peers.

A detailed record of this house and other children's landscape modifications is available in a film prepared with John Marshall and subsequently incorporated in part in the BBC Open University film: "Place and Play: Transforming Environments" and associated program notes (Hart, 1976).



PLATE XIV

"Throughout the town, usually beneath trees, there are patches of dirt which are very highly valued." This dirt map was photographed looking down from the branches of a tree on West Main Street.

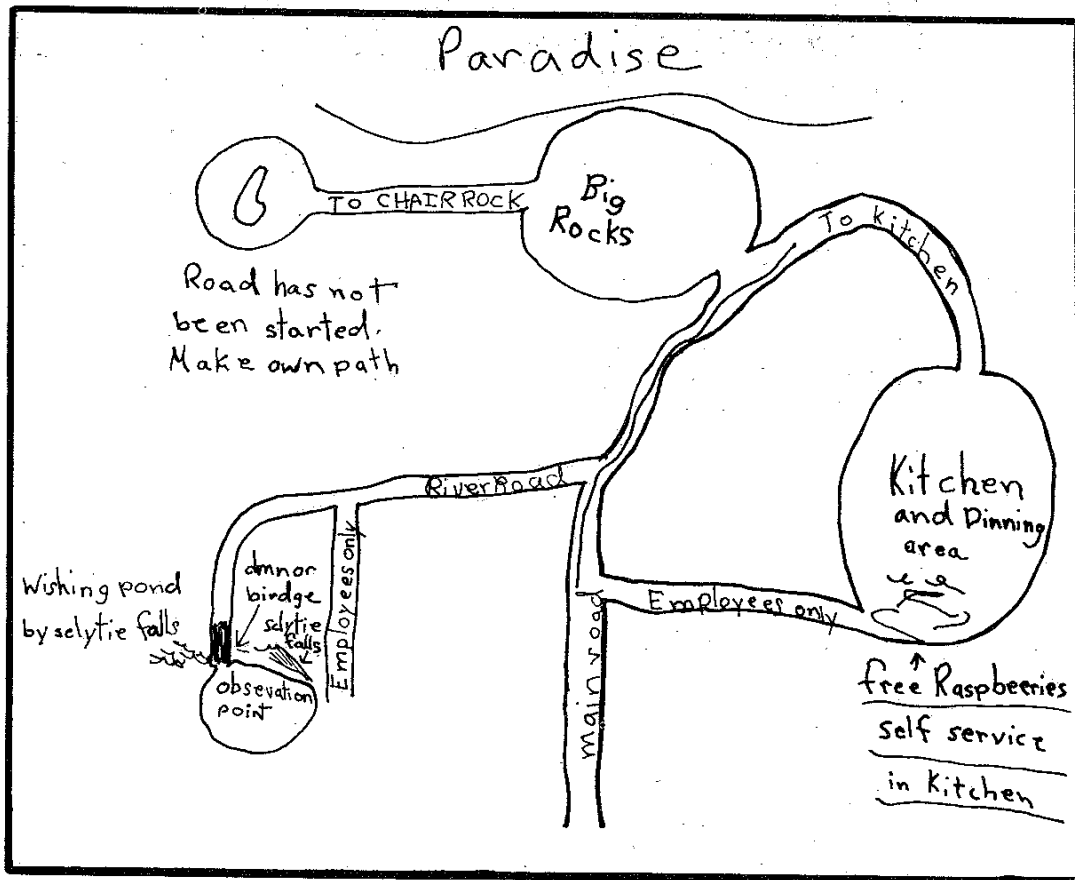
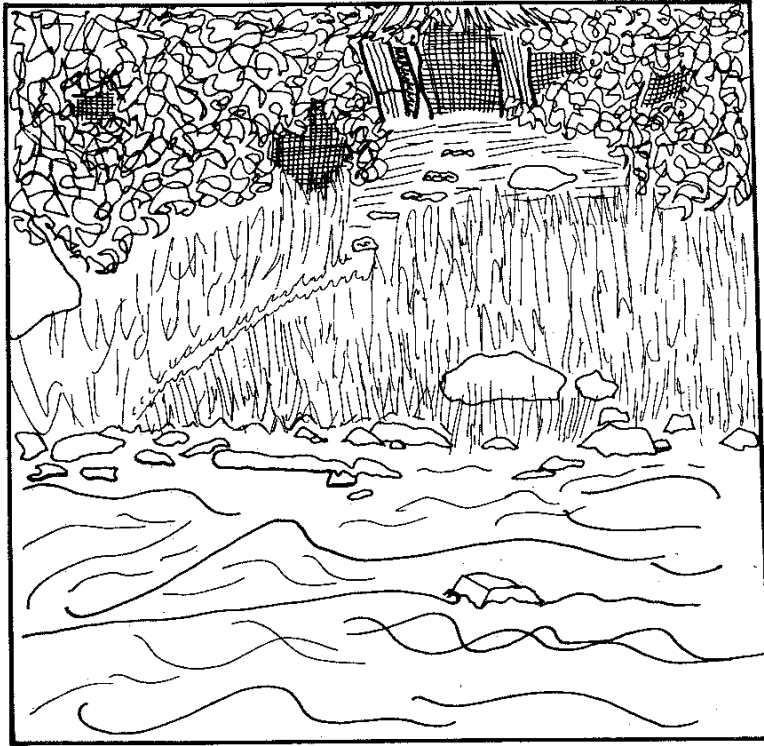


FIGURE 7-6: "PARADISE" ON PLUM HILL
 (Drawn by Katie (nine years))



ENTRANCE TO THE RIVER HOUSES, VIEWED FROM THE OPPOSITE BANK
 (Drawn by the 16 year old who had "inhabited houses" in the same location in previous years.)

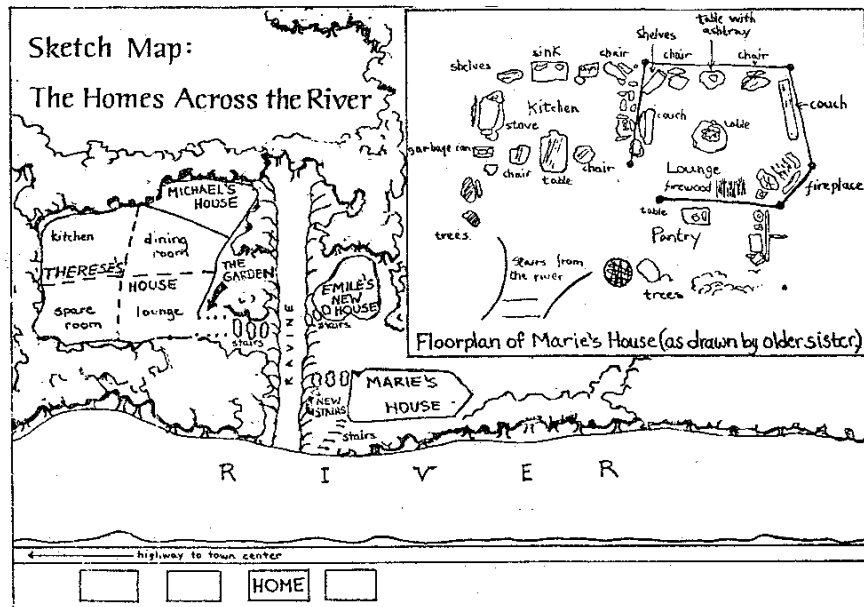


FIGURE 7-7: THE RIVER HOUSES

Other Building Activities

Dams across streams, go-carts, pulley systems in trees and bridges, are examples of other structures built by the children during my stay in the town. With the exception of one see-saw proudly made by an eight-year-old girl, by placing a plank across an old dismantled telegraph pole, all of these different objects are constructed by boys. There are of course many things constructed inside the homes by girls, which are rarely made by boys, such as clothes, puppets, jewelry, etc., but these were not a subject for investigation in this research project. Remarkably few toys and equipment are made in contrast to the records we have from other cultures such as the beautiful, detailed toys made from natural objects by the girls and boys of the Caribbean island of St. Vincent (Zerner; 1971).

The Psychological Benefits of Building

There are many theories of play and its significance in human development (see for example reviews by Millar, 1968 and Bruner et al, 1976). Taken singly, no one of these theories adequately explains the rich diversity and benefits of play or even accounts for the constructive and imaginative play described above. Taken together, however, these theories suggest some of the many psychological and social values that ensue from constructive and imaginative play. One of the better-known theories stresses play's merit in the learning of adult roles. This function has already been highlighted through the above discussion of the different types of building activities of boys and girls. It is further revealed in the uses the houses and forts are put to after they are built: girls frequently play house, spending very large amounts of time cleaning up the houses; boys devote most of their time to building and re-building the structures themselves and spend very little time inside them. They too carry out imaginative play in the houses when they are younger. Furthermore, I observed that while both younger boys and girls engaged in highly imaginative dramatic house play, boys older than about seven years of age rarely did so. They did however continue to act out imaginative dramas on their dirt-built model scenes. The answer undoubtedly lies again in the heavily socialized attitude that model interiors and model exteriors like their real-world equivalents are for girls and boys respectively. The dramatic play in these environments allows for girls and boys alike, the opportunity to act out real-life situations, express personal needs, explore solutions and even to experiment in the reversal of roles. Undoubtedly these functions are important but I believe there are qualities to this kind of building play beyond those of modelling the adult world. First, there is the satisfaction which ensues from the sense of being able to transform the environment successfully--the development of a sense of personal competence. Second, there is the comfort in being able to make a place for oneself; ordering the physical world assists in the development of a sense of personal order.

As with the house building, the dirt modelling of places also offers the opportunity for children to deal with emotional conflict by symbolizing phenomena and dealing with them through manipulation in a manner that is not possible in the everyday social world with adults (see for example Erikson, 1951). No doubt it is because this activity is so familiar to children and

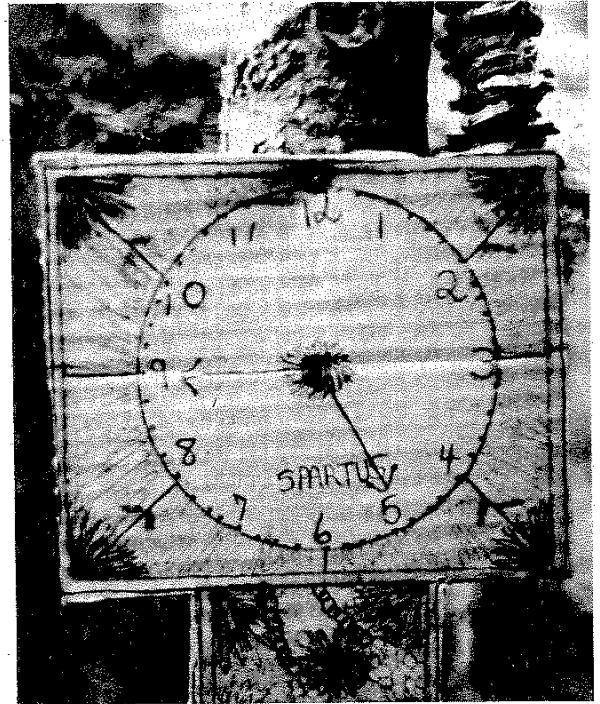


PLATE XV

One of Therese's rooms and two details from the river houses.

so valuable to them that psychoanalysts have formalized it into a diagnostic technique. In the 'small worlds' method, a child is offered a wide variety of toys and building materials. By observing and interpreting the building of miniature landscapes and the acting out of dramas in these settings, the psychoanalyst obtains valuable diagnostic insights. As Winnicott has aptly remarked, "The natural thing is playing, and the highly sophisticated twentieth-century phenomenon is psychoanalysis (Winnicott, 1974)." But while this is undoubtedly an important function of such toy (I prefer the word "model") play it has been unduly emphasised in the literature.

From my observations I have concluded that the micro-modelling of places and events is equally important in enabling children to better understand places and physical events and how they work. Again it seems there has been an over-emphasis in psychological theories upon the importance of social and organismic factors at the expense of children's interests and interactions with places, objects, and physical processes. A large part of this play activity of course involves the making of homes, travelling between them and having adventures on the way. Frequently however there is an extreme fascination with how the environment works, as in the detailed building of miniature tarmac roads with all of the various layers and processes, or with the intense concentration involved in mimicking the subtle differences of engine sound as a truck changes through its forward gears, climbs hills, reverses, and then lifts and dumps its load at a new house site a child is building. Children are building maps of environments, experienced or imagined. Such play offers the opportunity to reduce in scale, environments too large to be experienced by children directly. It offers superb opportunities to assimilate new knowledge and to re-work existing notions of the macro-environment.

The degree to which children modify environments varies according to the qualities of those environments and the degree of freedom they have in using them, as discussed above on the spatial distribution of landscape modification.

Property and Resource Ownership

In the ownership of toys and tools, children are expected to share with other children, and much of the time they do. In fact, in the heavily child-populated area of West Main Street, almost all of the cars and trucks are left outside for any of the children of the four families to use. This is not to say that the children do not have a keen sense of ownership; should the owner of a truck want to play with it he will usually repossess it very quickly unless a parent is around to intervene. Also, the subject of much of the dirt play with these toy trucks and cars is related to ownership and to commerce.

I noticed that the girls and boys of the poorer families found great satisfaction in finding objects and putting them to some original use. Emile (9) of West Main Street would probably not have enjoyed buying weights for his fishing rod nearly as much as he enjoyed going to the nearby gas station and foraging for just the right sized bolt. Similarly, in spite of Danny's (5)

satisfaction at receiving a new toy airplane, he seemed to spend more engaging times making his own airplanes from clothespins. In the same manner, the tent that Johnny (9) bought from the Universal Supermarket occupied only as much of an afternoon as it took to figure out from the simplified instructions how to tie it to the maple tree: in contrast, the lumber from this maple tree when cut down, provided the building material for house building on three different locations during the summer. Such resourcefulness with objects was not characteristic of many children of the middle income families, whose parents felt that to maximize their children's opportunities they should make all attempts to provide them with whatever toys and tools that they might need. I do not wish to suggest that economic necessity was the only factor, or even the most important one. I noted that those fathers skilled in the physical trades encouraged their children to "make-do" with the resources at hand through invention, something which I never saw from the professional parents. I cannot speak as confidently about girls, as their "training" was largely inside the house with their mothers, and hence outside of the bounds of my study. It seemed to me, however, that all boys and girls whether of upper or lower income families, professional or manual workers, when very young (six and younger) find immense satisfaction in discovering uses for things by themselves. Only through over-provision and a failure of the parents and the school to encourage resourcefulness, is this important skill lost. The more important resource locations are identified on Map Figure 7-8.

Commercial Geography

Work

In addition to the allowances given by parents, a number of children, particularly from the poorer families earn money in order to save up for expensive items as skis and bikes. This activity varies from selling Christmas cards to mowing lawns. It seems that the children are not considered capable of "work" until nine or ten years of age. Before this time, a child may run an errand to a store and keep the change but these activities are not given the status of "work." There are however, various additional sources of income and barter which the children themselves develop. Small stands may be set up on front lawns to sell "Koolaid," refreshments, comics, bike parts and any other objects they may have at hand. While adults will often buy from these places they by no means consider it serious work; these children have not made the qualitative jump from "play" to "work," though the children themselves would find it difficult to see the difference, I am sure.

By the age of nine or ten the majority of the boys and a few of the girls find some small source of income. The most steady income in the town is the newspaper delivery. With the exception of one High School girl, all of the paper-route franchises were held by boys of fifth and sixth grade level. All of these boys were very reliable types from middle income, rather than poor families. To what extent this was the result of self-selection or the choice of the management I cannot say. Other boys of this age group manage to find odd jobs weeding gardens in the spring, mowing lawns and washing cars in the summer, and raking lawns in the fall. There did not seem to be any winter jobs for the elementary school boys.

Girls begin to find a most lucrative source of money in the form of

babysitting beginning around the fifth-grade. They may also be employed by a few of the more open-minded folks in town to rake lawns, but that is the limit to their manual earnings. Also, boys are occasionally invited to babysit, but this seems to happen usually when no girl can be found.

Spending and Trading Patterns

The frequency of children's visits to commercial places, as reported in their diaries, is described in Table B-17. The locations of all places from which the children of three or more families buy, are recorded in Map Figure 7-8.

The stores in the town center are the most frequently visited category of commercial places. As with all "downstreet" locations, there is an increase in the frequency of use as children grow older. It is noteworthy that none of the visits made to the stores during the diary record period were made alone, and only four were made with parents. The remaining 41 were made with other children. This information accords with that of the previous section concerning parents' attitudes to spatial freedom "downstreet."

The reasons why the three town center stores are the most frequently used are simple to identify from the children's point of view: all three carry candy and soda, and one of them carries in addition, comics and toys. The parents offer different explanations. Some even allow children as young as seven to visit at least one of the three stores with permission, because they can do so from each of the three hills without having to cross one of the three major roads (Map Figure 3-5). Also, although it is considered very dangerous, the parents of older elementary school children find considerable comfort in the knowledge that there are traffic lights at this intersection which many of the children have learned to negotiate with their parents and, for many of them, through their daily route to catch the school bus at the High School with other children.

In comparison to the town center, the East Main Street stores are completely out of bounds to all girls or boys under nine years of age except for one family living at the bottom of North Hill Road who simply have to turn the corner to get there. This restriction is not based solely on traffic fears. The parents consider this territory to be for the tourists and "outsiders," and they fear bad social influences; this contrasts with the remainder of town where they feel more in control of any wrong learning that may come their child's way. As was described in the place preference section of the previous chapter, this is an extremely important area in the children's minds, with an ice cream parlor and large knick-knack store with everything a child might wish to buy. But the parents' rules are clear, and they are followed.

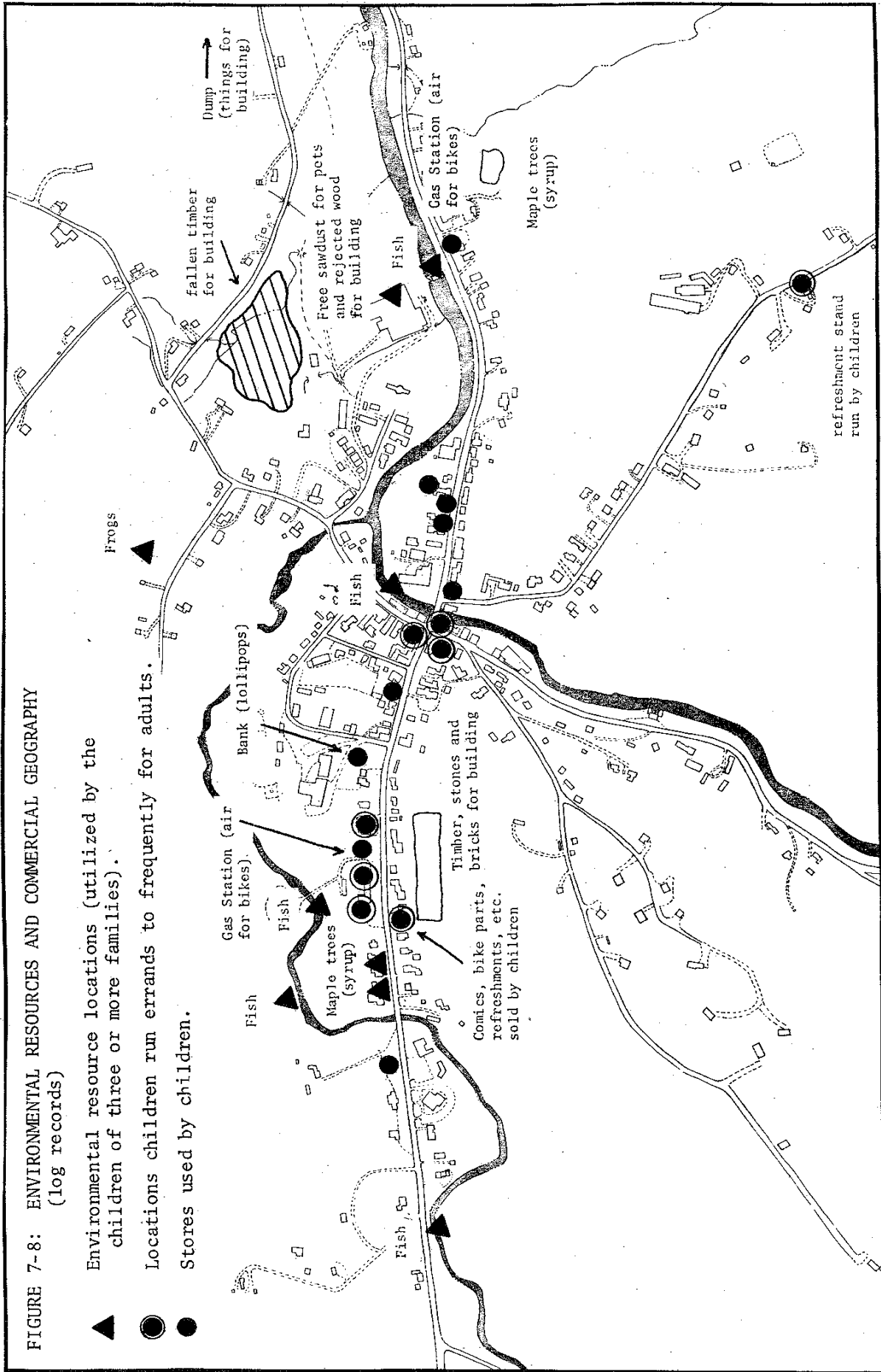
The Universal Supermarket on West Main Street was visited with equal frequency by the younger and older age groups of children, but the visits of the younger children were made entirely with their parents. It is in fact a primary social experience for the pre-school children. It is one of the few regular contacts they have with a physical and social world other than the insides and backyards of friends' homes. Again, it is worth noting that while

FIGURE 7-8: ENVIRONMENTAL RESOURCES AND COMMERCIAL GEOGRAPHY
(log records)

▲ Environmental resource locations (utilized by the children of three or more families).

● Locations children run errands to frequently for adults.

● Stores used by children.



the six boys' trips to this place were undirected trips made alone or with other children, nine of the 13 trips by girls were either "directed," or with parents.

The ice cream stand is at the top of the children's place preferences (Chapter VI and Table B-15). As the diary record suggests, children younger than nine are not able to visit this place without parents, with the exception of the two sisters on the north side of West Main Street and the three girls on the south side of this street, if one of the parents or elder sister watches them across the street.

The high frequency of visits to the post office is largely explained in terms of children, especially girls, collecting the mail for their parents. The children seem to enjoy this responsibility. The particularly high frequency is explained by the one girl who had a very serious set of pen pals which led her to check the mail whenever there was a new delivery. For all other children in the town, letter writing was an extremely rare occurrence.

In addition to these various purchases, Inavale offered numerous free resources, such as fish from the rivers and brooks, lumber and rocks for building, and maple syrup. Children find great enjoyment in finding insects, animals and such usable resources as fish, worms, seeds, pods and fruits. Considerable premium is placed upon this ability within child culture. Perhaps this partly explains the intense manner with which such secrets as the location of newly ripe plums are kept by children, although a general desire for creating intrigue through "secret" places is probably a more important explanation. Of these items, already discussed above under Land-Use, only the maple syrup is occasionally sold, usually as a grossly overcooked, black treacle! Remarkably little bartering seems to take place in comparison to my own childhood. It seems that the children are rather encouraged by their parents to give away, rather than trade, an object that another child may really like.

Family Differences in Children's Place-Use and Activity

Parents commonly encourage those aspects of their children's activities which they feel conform most closely with what kind of person they believe their child should become. The most obvious example of this is the very different anticipations parents have with regard to what kinds of activities are consonant with the future of boys or of girls. It is this I believe which explains many of the differences in the behaviors of girls and boys, discussed in the above sections. But there are also dramatic differences which cut across these sex distinctions. No attempt was made in this study to compare parents' environmental behavior to that of their children by using any standardized techniques. I did, however, notice one major variable, other than the sex of the child, which seems to have a strong influence on children's activities: the nature of the fathers' occupations. (This is more noticeable with the fathers because most of the mothers are at home all day, and of those who do work, there is less of a range in the types of occupations.) Those fathers skilled in the manual trades encourage very different attitudes to environmental behavior in their boys than those stressed by other fathers. It

is not an accident that the children of Greenlawns Hill place such emphasis on baseball, basketball and football, while the boys of the two West Main Street families and the Robinson family of Plum Hill are so much more interested in exploring, building, hunting and fishing. Their fathers actively encourage these different activities either by participating with them or, as the following log extract illustrates, through proud verbal exclamations:

While looking for Charles (10) behind his house on West Main Street, I found his father tending the vegetable garden. He proudly explained: "He is likely to be up in the field. He goes up there more time than anything else like this baseball field here (pointing to the large mown area behind his garden). He loves hiking up there and fishing the best. Do you know, he's caught about 12 to 15 fish in the past two weeks!"

So far the children's geographical world has been objectified in order to describe the broad picture of the development of spatial activity, place knowledge, values, feelings and use in the town. The inevitable effect of this has been to present a fragmented view of childhood place experience. It is only when one journeys through the environment with a child that these various dimensions of experience may be seen interacting with one another. The following log excerpt from my place expeditions with Christopher (4) illustrates how a child's parentally allowed free range of environment, his place knowledge and his place values work together to influence whether or not a particular place is likely to be used. Christopher's landscape model was illustrated in Chapter V (Figure 5-3).

October 3rd. Standing in his yard, Christopher (4) recalled his "clubhouse" with seemingly no reference or visual reminder from outside. I gathered from his elder brother, Elliot (10), that none of the family had been there this year at all. Christopher remembered it was across the street, but that was all. This area lies outside of his "free range" and beyond his spatially representable world (see discussion of Christopher in Chapter V). We walked across and into the brambles and tall grass and he was lost. Christopher said it was near the river. Elliot navigated us down to the river via a complex journey that came back upon itself many times. Christopher had no idea which way to go but he claimed the knowledge that it was in here somewhere. He explained, "This is where the lions are" as we pushed our way through an area of tall grass (4½ feet high). "Have you seen them?" I ask as neutrally as possible. "Yes, but it was only a small one." Certainly the weeds with brittle slender stems and fluffy large seedpods are reminiscent of the savanna and as we struggled through these, Christopher may well have been recalling some T.V. show. Suddenly, while walking along the river bank, Christopher ran towards the bridge a few yards to a small natural inlet where the vegetation receded. He pointed to some tall weeds surrounding the inlet and demonstrated

admirably how one could sit down and hide in his
"house."

The following Family Studies attempt similar more holistic accounts by describing the place experience of individual children.

PART THREE: The Family Studies

Having presented an overall aggregate survey of children's spatial activity, place knowledge, place values and feelings, and place-use, it is now necessary to understand how these various dimensions of children's lives interact. This is best achieved by presenting in greater detail my observation of some of the individual sub-sample of children with whom I worked most closely. This is the main purpose of the following two chapters.

In recognition of the range of differences in children's spatial behavior and place-use which results from different physical locations of a child's home and from the presence or absence of child neighbors, I have described families from two very different locations. The children of the first set of families (Chapter VIII) residing on West Main Street live near the center of town, with houses all around them and in such close proximity to each other that they have few problems in finding playmates. The children of Chapter IX, by contrast, live near the top of Plum Hill with open fields all around them, removed from other children. Some of the effects of these different degrees of environmental and social opportunity on children's environmental behavior are revealed by contrasting these two families.



PLATE XVI

"The West Main Street group of children is extremely fortunate in that the landscape within their range is almost entirely free for them to use and modify in whatever manner they choose."

CHAPTER VIII. The West Main Street Families

<u>Clemens Family</u>	<u>Stevenson Family</u>	<u>Alcott Family</u>	<u>Collins Family</u>	<u>Hudson Family</u>
Tom (8:5)	Frank (12:0)	Enid (6:0)	Clark (7:9)	Henry (7:5)
Beckie (9:6)	Louisa (11:0)	departed from	Mike (5:0)	
Jane (12:0)	Johnny (7:9)	the house	arrived at	
		December,	house	
		1972	September,	
			1972	

Approximately 440 yards from the center of town on West Main Street lives a cluster of families with a total of 11 children, living in three buildings. Each of the four, and for a while five, families living there had young children. Only one of these families was originally chosen for special study, but because of the close proximity of the others, I quickly became very familiar with all of the children. They play together so much that it took little additional effort to work closely with each of them. The noticeable greater attention to the Clemens family in the following description is a result of their being the original one chosen for special study. The five families are discussed in turn, but first the immediate environs of these houses must be described in detail. These descriptions are especially important in this case because almost all of the children's non-school, out-of-doors time is spent within 200 yards of the four apartment buildings.

The four apartment buildings lie between 20 and 30 feet from the busy highway (Map Figure 3-6). The topography and vegetation is represented in Map Figure 8-1. On the northern side of the houses, lying towards the highway, the land is open grassland and hard bare dirt. The large driveway and parking area, which serves three of the houses, consisted of dirt until it was covered over with gravel towards the end of the study period. The remainder of the ground in front of the house is largely made of long grass. However, lining the road are mature maples and an elm and surrounding the most favored of these is a patch of bare ground, a result of the severe shading from the tree assisted by the children's intensive activities. Much of the rear of the dwellings is open meadow with long grass and weeds in the early stages of being colonized by bushes and trees. Ten yards to the rear of the easternmost house, the land rises sharply for 15 feet forming a steep bank, and in places a cliff. Behind this, the land continues to rise, though less steeply, for 100 yards through a young stand of birch trees, known as "The Wood," to a barbed-wire fence. Beyond this fence, for a few hundred feet to the top of the hill, the land is a mixture of tall grass, bushes and young trees. At the very top of the hill, the scrub opens out to a few acres of tall grassland. To the west, in the rear of the second apartment building, a landscape of tall grassland rises more gradually, to the barbed-wire fence where it also becomes a more wild area of bushes, trees and grass. The most western of the three buildings has to its rear, a moderately steep bank of mown grassland rising to the barbed-wire fence. These three rear properties are each separated by a line of trees.

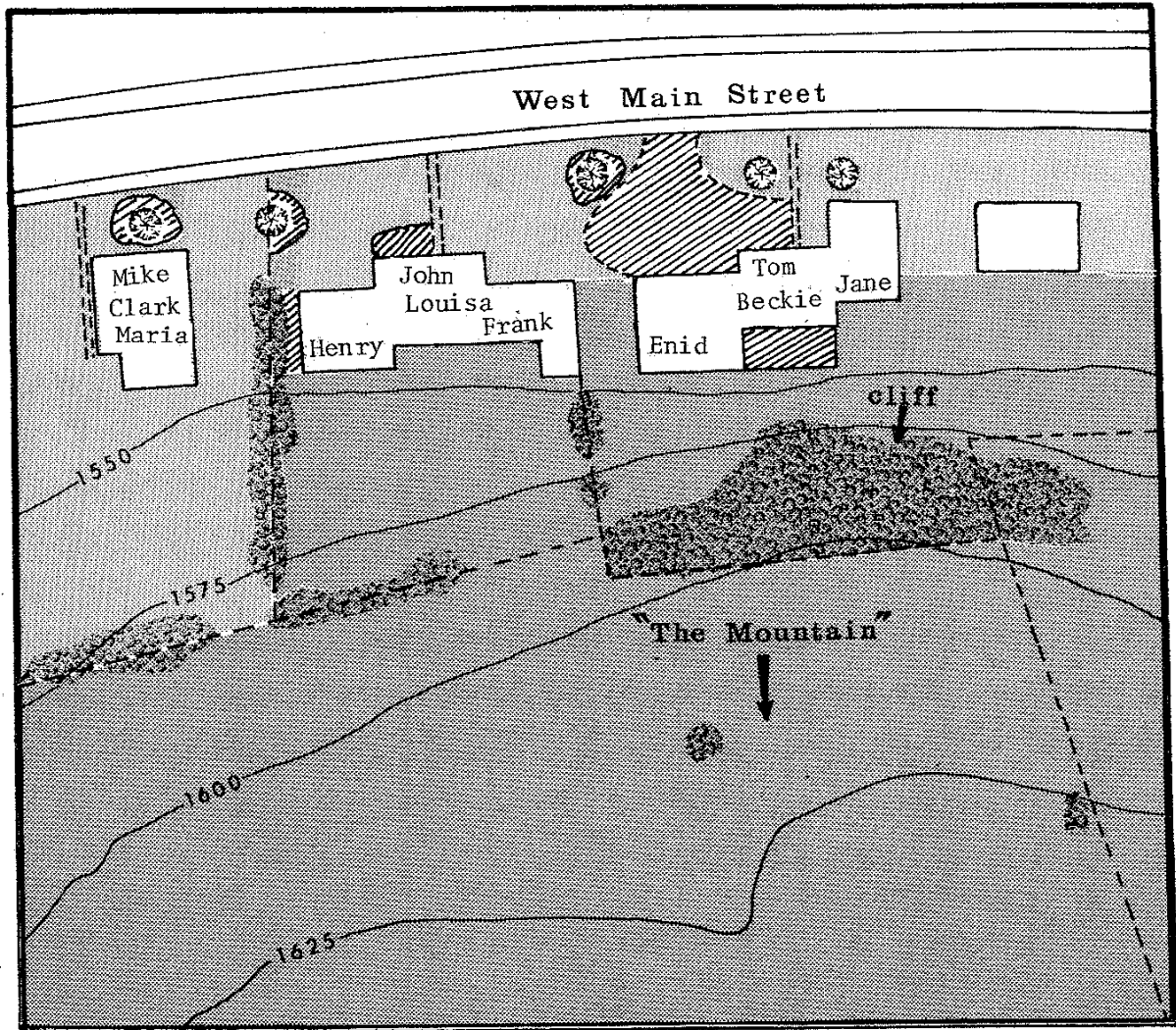
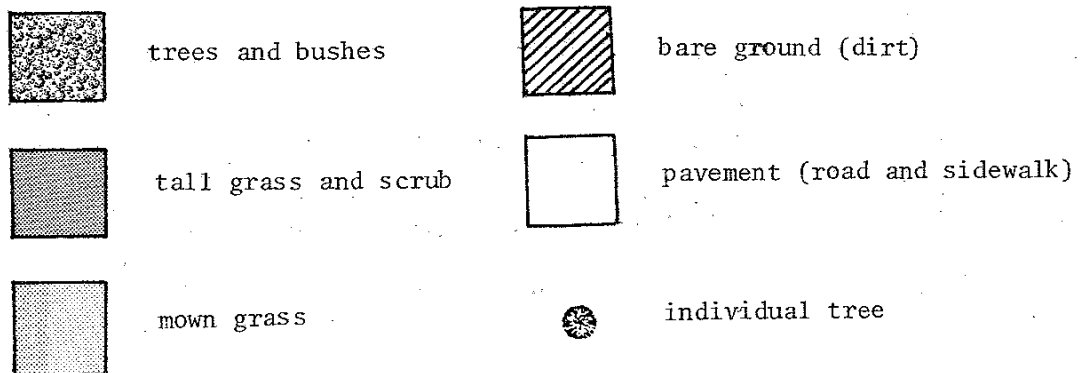


FIGURE 8-1: CHILD POPULATION, TOPOGRAPHY, AND VEGETATION



Spatial Behavior

Tom (8) and Beckie (9) Clemens

In the most westerly apartment building lives a family of three children: Tom, Beckie, and Jane (12), and their mother. Mrs. Clemens explained that Beckie and Tom were thought of as twins by her and by others. They enjoyed being together and so, claimed the mother, they were treated by her as twins. For this reason they are discussed together, and their sister, Jane, is discussed separately.

Tom and Beckie's free range extends in the rear of the house as far as the barbed-wire fence. Tom's mother had been advised by an elderly married couple three doors down, not to let them play on the hill above this fence because of the old wells up there with rotted boards which were now covered with trees and bushes. To the west the range extended as far as their neighbor's property but to the east it had become elongated to take in the home of the elderly couple who loved to talk with the children. The visits to this couple, who always sat out on their balcony, had become so frequent for Tom and Beckie that the mother had come to accept this as one of the places she would be able to find them, and they no longer bothered to explain each time they went there. It seems then that the range described as not requiring special permission was not outlined in advance by their mother through careful reflection but was determined by Tom's and Beckie's previous patterns of spatial activity "with permission." Once a pattern has become sufficiently established through frequency, as long as no problems develop, it becomes accepted as one which requires no further negotiation between mother and child. Children then, have more influence on the particular configuration of their ranges than the aggregate general account in Chapter IV might have suggested. In responding to the question, "Why do you limit the child's range?" the mother explained: "Experience--like he got wet in the creek last summer so that was made out of bounds." Central to this concept of range expansion then, is interactive environmental learning by both children and parents.

Tom and Beckie's free range does not extend across the main road, even though their mother has no particular fear of their ability to deal with road traffic. She failed to mention it when questioned about dangerous places, and when pursued on this point, explained, "I think traffic is more dangerous for us (adults) because we have too much on our minds." Why then does she restrict Tom's and Beckie's movements? Again the simple answer is "I like to know where they are." The value of this is twofold: the mother can reach them if she wishes to leave, and she knows where to find them if worried about them having been gone too long. Restrictions around the homes are shown in Figure 8-2.

Given this concept of the children's own role in the setting of range-restrictions, it is easy to understand why the "free range" took on the shape described in Map Figure 8-3. The free range is much smaller on the north side of the road because there is little to initially attract the children over there except for the supermarket. To the west there is a gas station and post office and to the east are residences with no peers (two younger girls and a teenager only).

While the children's demonstrations of competence and pleadings for

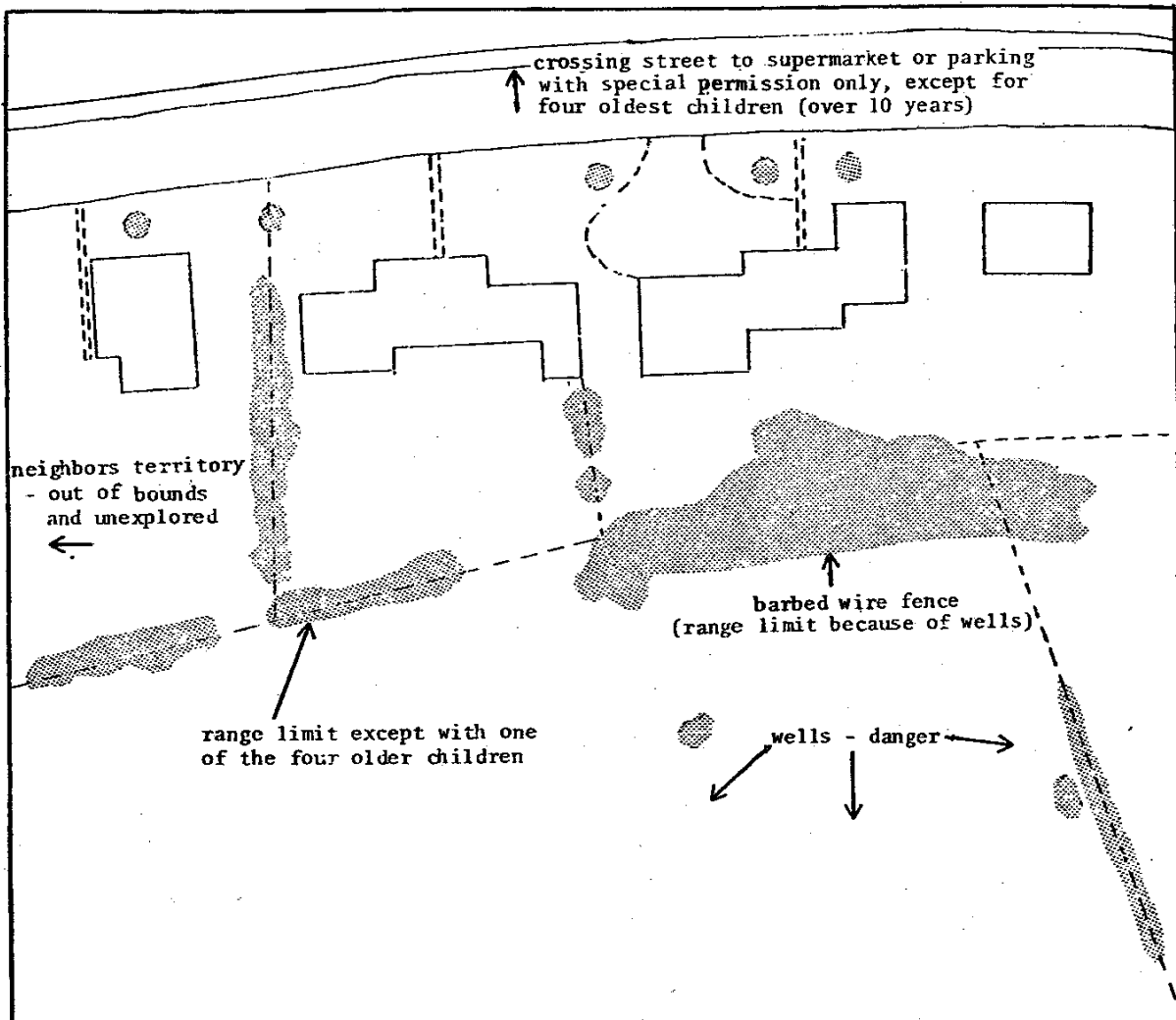


FIGURE 8-2: WEST MAIN STREET - SPATIAL RANGE RESTRICTION AROUND THE HOMES

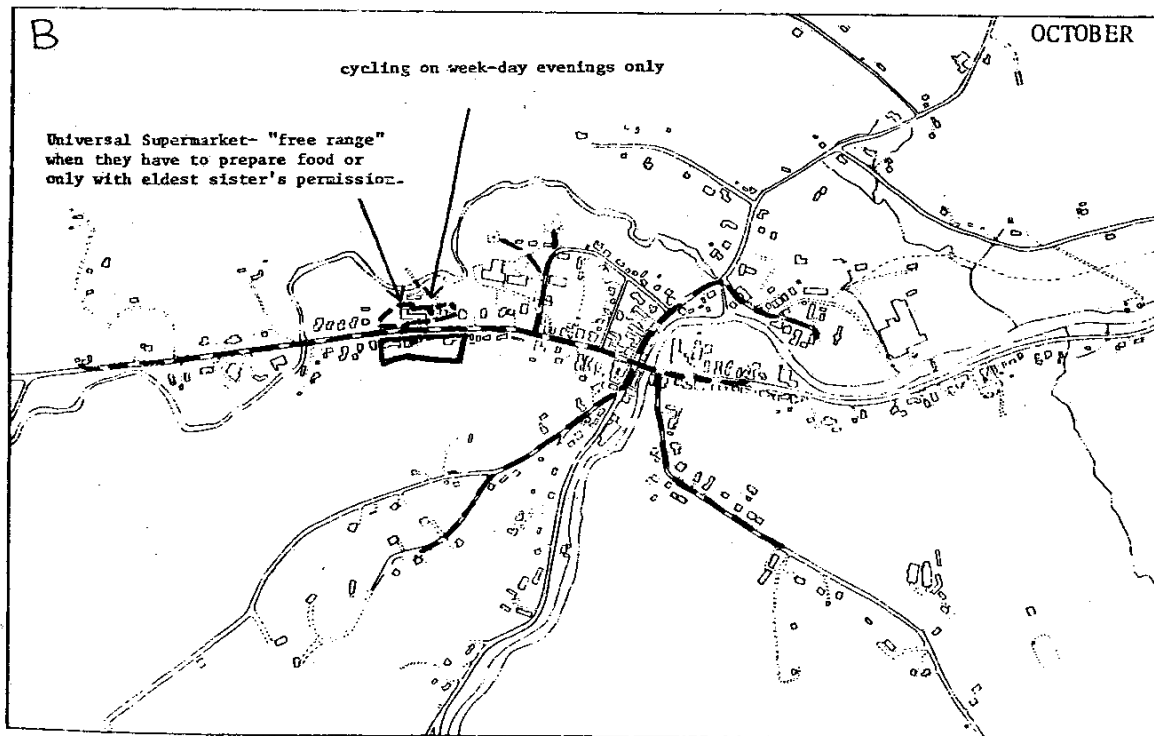
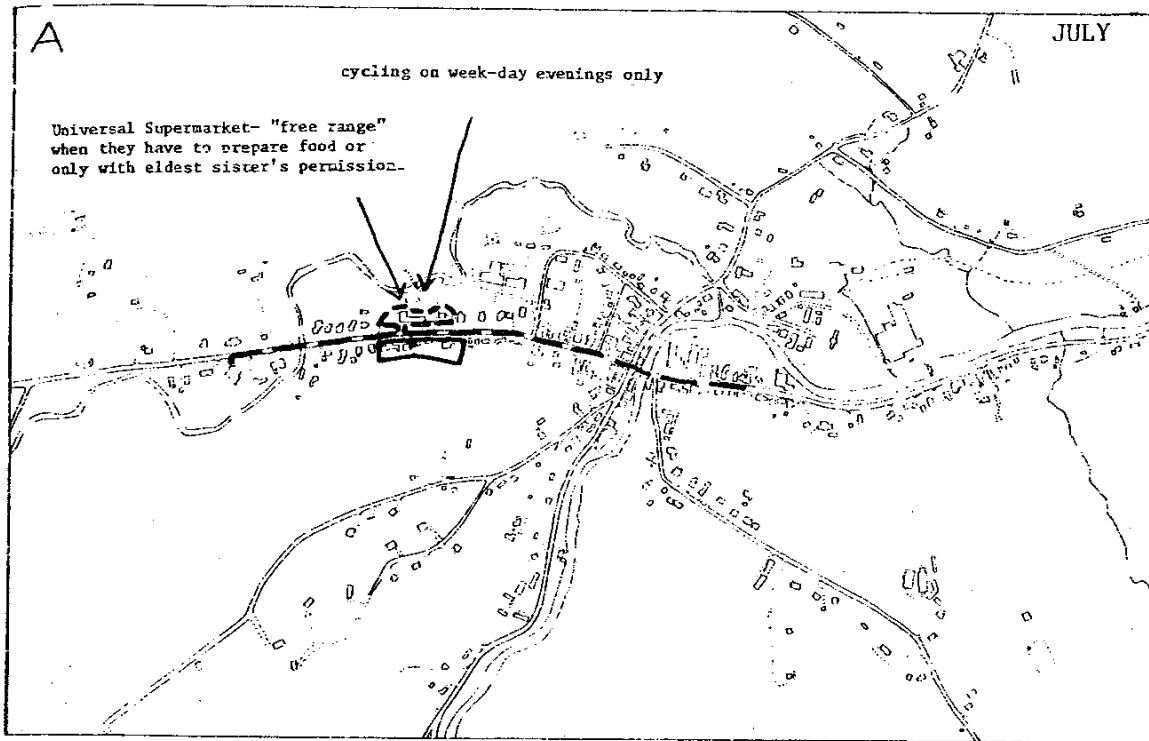


FIGURE 8-3: TOM (8:5) AND BECKIE (9:6) RANGE RESTRICTIONS

- Free Range
- - - - - Range with Permission
- May go anywhere with eldest sister (12 years)

extensions do have an influence on their ranges, it is the parent(s) who make(s) the final decision. By the time my second spring in the village came around, Tom and Beckie were occasionally allowed to visit West Brook but this had not yet become an automatic feature of the children's spatial ranges and the reasons for allowing or not allowing them to go were not made clear:

May 29th, Monday 3PM. I arrived to find Tom and Beckie begging their mother to go to the West Brook at the Bridge. She refused and explained with a smile that she had been refusing all day. I cannot understand such a strong prohibition and neither can the children it seems. Often it seems a parent will be tight in her restrictions not because of any real fear but because of a general desire to remind the children of "their place" and thereby to ensure that their children do not become too independent or "wild."

Tom explained that there are few places he goes to on his own with special permission because he goes almost everywhere with his sister Beckie, who is only one year his senior. Even then Tom mentioned few places he and Beckie could go to with special permission (Map Figure 8-3A). His mother explained the situation more generously:

The places he can go to are defined by those he can't go to, such as the stream and the hill in back, with the wells. He can go downstreet or any place within reasonable distance as long as he can get home from his friends, before dark.

It seems Tom had not tapped fully the potential of his range. There are a number of possible contributing factors. First, my detailed interview with Tom was conducted in early July. As has been shown in Chapter IV, children's range is large and grows during the summer but is small and rarely expands through the winter months. It is not surprising therefore to find that when interviewed again in the fall, the number of places Tom felt he could visit had increased substantially (Map Figure 8-3B). It seems that in the past he had no strong desire to visit friends' houses in order to play. Understandably so, for within 100 yards of his door live eight children between four and 12 years of age, in addition to his own two sisters. Also, across on the north side of the road, the town's supermarket attracts all of the town's families at some time during each week, and the parents commonly allow their children to play with the West Main Street families on the south side of the road while they shop. It is not surprising then that Tom mentioned only one child's home when asked in July if there were any places he would like to be allowed to visit.

By October, not only had Tom visited this classmate's home on Greenlawns Hill, but also the home of another classmate on Plum Hill (Map Figure 8-3B). Similarly, by October, Beckie made occasional trips to her classmates' homes on North Hill (Map Figure 8-3B). They both also included in their "range with permission" Casey's home (11) in the extreme east of the town, the ballfield, and the tourist stores at the eastern end of the town. The expansion of range towards the tourist stores is easy to understand for this is the most plentiful source of ice cream, candy and toys in the town, however the sudden increase in social contacts is not quite so easily under-

stood. Tom and Beckie are at the age which is claimed by normative developmental psychologists to be the age at which children commonly develop an interest in group activities and games (Appendix A-4). A more specific explanation of why Tom's and Beckie's social-spatial range grew however, is that they began to participate in Little League. Little League ended the spatial separation from their classmates (1). Due to two baseball practices per week at the High School, the children now came into contact with their class friends frequently, enabling them to make additional play-dates which were subsequently put to mother for approval.

Tom and Beckie were allowed, with permission, to travel anywhere in town with their 12 year-old sister. They were also allowed to visit otherwise forbidden places such as West Brook, lying west of their home, with older children such as the girl next door who is 11 years old. The mother is most discriminating however, in her choice of children for caretaking. In response to the interview question on "range with others," she explains of Tom:

He needs certain "types" of children, not ages, because they are like mothers. He needs this because he is too enthusiastic. I wouldn't let him go with Dick (a 10 year-old boy) because of Dick's attitude, but I would with George (an 11 year-old boy) because he is competent and has common sense. George knows how to look after himself and knows all kinds of places. Two years ago Tom used to go fishing with him.

(RH: Where?)

All over town I guess, I don't know--I felt really comfortable because I knew George well.

Their range with a bicycle is markedly more restricted. Their mother explains that "They don't have any place right now other than the supermarket parking lot on weekdays after store hours, and the sidewalks." She remarks how, when staying in the country in Pennsylvania, two months previously (August), she had let Tom cycle anywhere with his cousin (one year older). She volunteers an explanation for her restrictions:

I'm not sure that they are good enough on bikes to be on the streets. They have to borrow bikes. . . They can use the sidewalks and the Universal Supermarket parking lot when its empty, but if they had their own bikes it would probably be further. Jane (age 12) can go anywhere when she borrows a bike.

The suggestion here is that their cycling experience is not adequate but that with more opportunity for practice their range would be greater. When asked whether she felt that the children lacked physical coordination and skill, or mental attention, this mother could not say. Again, it seems that the restriction is not the result of a carefully thought out de-

1 No doubt the social dynamics would have been different if Inavale Elementary School were in the center of the town with after-school programs to serve as a social center.

cision but of a "feeling" that it is correct. Her feelings develop it seems, from the combination of the children's demands for extensions of the rules, Mrs. Clemens's understanding of her children's different personalities, and her observations of their performance.

Jane Clemens (12)

Jane was in the sixth grade at the time this investigation began and so did not participate in the systematic methods that were administered in the classroom. Because of my close association and frequent visits with her family however I can confidently describe her spatial range (Map Figure 8-4). Without requiring the special consent of her mother, Jane's range was almost as constricted as that of her younger brother and sister. When her mother was away from the home, Jane could go across the road to the supermarket or the post office but any other places were out of bounds unless particular instructions had been left, such as, for example, to do the laundry across the road, or visit the West Main Street food stand to buy a hamburger. Furthermore, when their mother was away from home, the children were usually not allowed to play out of doors. These rather tight constrictions stemmed from the mother's feeling that without her presence and with no other adult available, the children might not be able to handle any unusual or dangerous situation that might arise. But clearly the mother considered Jane competent because she was allowed to go almost anywhere in the town with permission. This trust, built over a twelve year period of experimentation and negotiation, resulted in such a close understanding between mother and child about ranging away from the home that the mother was heard to scold Jane one day in April for being late because "you must have heard me calling you in your head."

My interpretation of Mrs. Clemens's tight restrictions is that she was acting on the basis of fear that looking after her children without a second parent might result in their being unsuitably socialized. Due to her desire for her children not to get out of control, she kept them within her realm at all times. Such unique personality variables undoubtedly account for much of the variation in children's parentally defined ranges. It is difficult to identify these variables, but fortunately, as will be shown, mothers are themselves very often aware of the unique aspects of their child-rearing and will voluntarily offer explanations.

The Clemens children do not always follow the range rules, and their mother punishes them. Punishment in these cases in this and other families, are designed to fit the crime--"grounding." As an example of its application, Mrs. Clemens explained that Tom had recently not returned home from the school bus, but had instead visited the home of one of his classmates. Although this friend's home was only about 300 yards along the road, Tom had broken the rules by not reporting home to say where he was going. "Grounding" in this family includes chores and initially the "sentence" may be designed to be for a week. However, Mrs. Clemens explains that she never really sticks with the grounding for more than a day or two.

Mrs. Clemens responded differently from either Tom or Beckie on the question of danger. She felt that the wells in the back of the house and the sandbank (Quarry in Map Figure 3-1) were dangerous. In both cases she had been

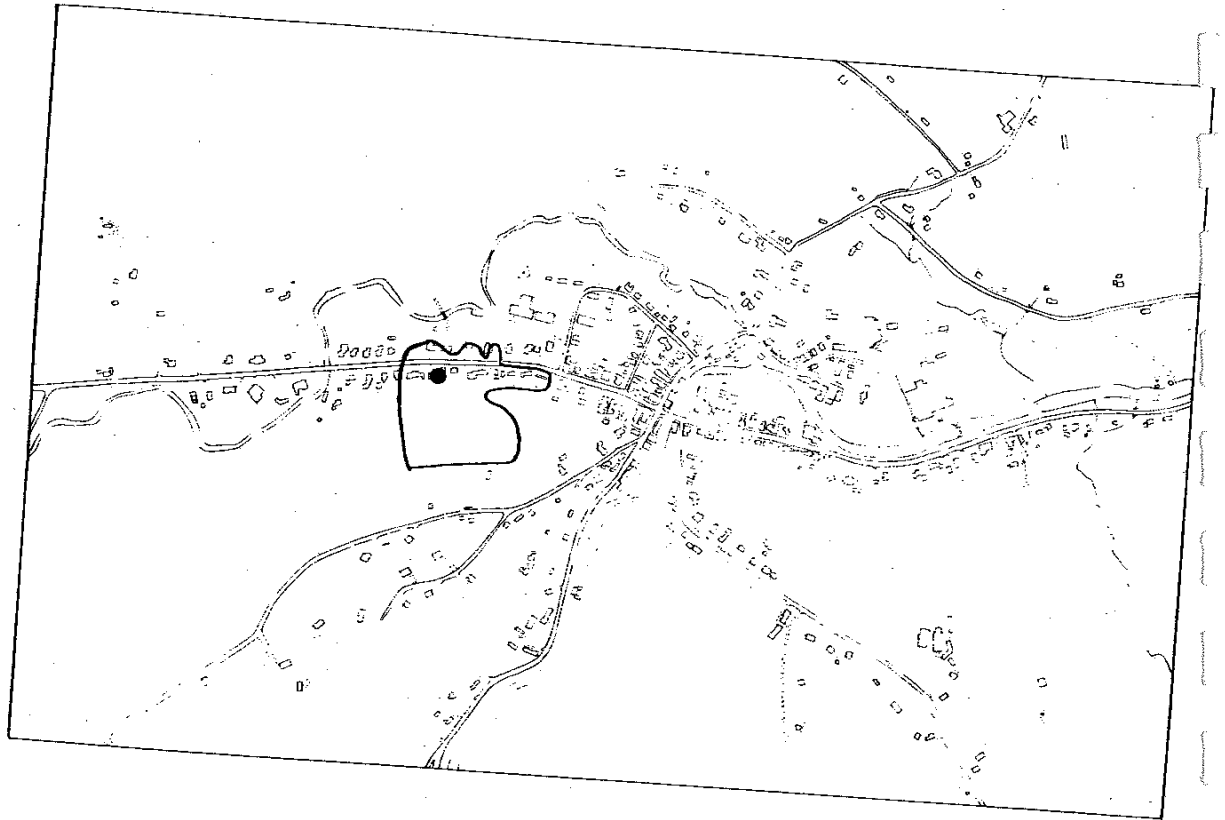


FIGURE 8-4: JANE (12:0) RANGE RESTRICTIONS

Free Range
Anywhere in town with permission,
on her bike when traffic is light.

told so by neighbors. Even before the death of the boy in September of 1972 the police had warned the parents to keep their children away from the "sandbank." In comparison, the children saw the road as the only dangerous element, even though they had been told about the sandbank and reminded about the wells many times. In response to my questioning during the interview, Mrs. Clemens did not indicate that any roads were dangerous for children, but when asked what changes she would like made to improve the environment, her first thought was for places for the children to ride their bikes. It seems that for Mrs. Clemens, living next to the extremely busy Main Street is such an obvious hazard to her children that she responded to it long ago with suitable training safeguards. For this reason, it no longer enters her mind as being dangerous. She most lucidly explained to me that dangerous things are not inherently so, they are only dangerous when her children have not had the opportunity to learn about them and how to behave with them.

The problem with this philosophy which Mrs. Clemens like many parents recognize but cannot ever deal with entirely adequately, is that it is difficult for a parent to know in advance what all the dangers are, and one cannot always rely on one's children, or other adults, to report new dangers. An extended extract from the log records dealing with two serious dangerous elements, illustrates children's inaccurate reportage of dangers and the inevitable risks all parents take:

May 14th, 7PM. Jane asks her mother if she may go out on her bike. In answering yes, there is no need to say where, for Jane knows that it is understood she will go nowhere further than the sidewalk or supermarket parking lot across the road. She returns 10 minutes later and asks if she may go to the sandbank with "the others." To my surprise, Mrs. Clemens says yes but 10 seconds later calls out to her that she's heard from townsfolk that it's dangerous. Jane says it's only dangerous near the caves. Because of a lack of information Mrs. Clemens lets her go, and returns to the house declaring that she must find out more about it. She relates to me how Mrs. Maple warned her a week earlier of the wells outside in the back of the house. Coupled with this warning came the story of how a father and son from Northville had been lost down a well last year. She explains how in response she has not let them out in the backyard since.

Unfortunately for Jane and Frank and two friends, they cannot climb the sandbank because the firemen are practicing with their hoses there. Tom and Beckie join the growing group of children but after a few minutes the fun of watching is over. The younger children including Tom and Beckie begin making balls from the clay and throwing them. Jane and Frank return to the supermarket and begin playing wiffle ball on the front lawn. The others join in but at 7:45PM mother arrives and explains it's dusk and they should come in. Tom pleads to be able to stay to watch the firemen across the street (whom he has not even glanced at for ten to 15 minutes).

June 27th, 11AM. We climbed up above the small stand of trees

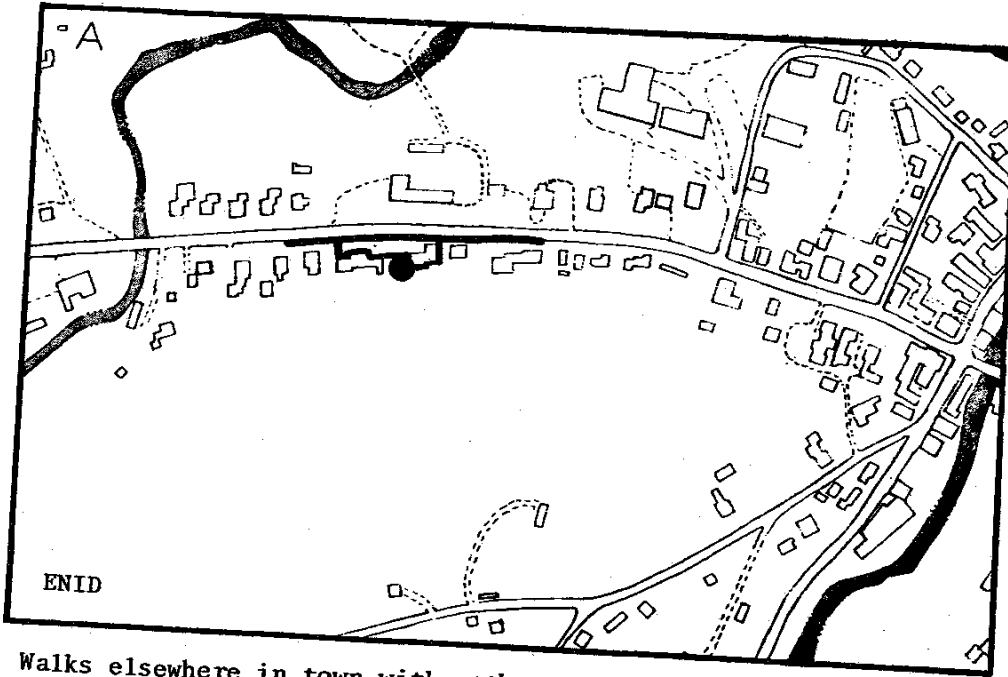
to more long grass. The three wells they showed me were a surprise. Mrs. Clemens fears were real, for the cover boards had rotted on all of them. They were two to three feet in diameter and could easily swallow any child hurrying down the hill through the long grass. The children recently told their mother not to worry about the wells because they did not go on the side where the wells were, that is, above the fence on their side of the house. But in fact there was nothing to demarcate this line and their house could not be seen through the trees to serve as a marker. Consequently their definition of "the side where the wells are" was one which changed with the moment; one of the "white lies" of childhood which these three rovers have rationalized because they feel safe in the knowledge that they know exactly where each of the wells are.

Vagueness with language was a strategy commonly used by the children to win greater spatial freedom from their mother. Mention has already been made of how boys more frequently carry loose definitions of where they can and cannot go. The title of the book--"Where Did You Go? Out. What Did You Do? Nothing." is an extreme example of this vagueness.

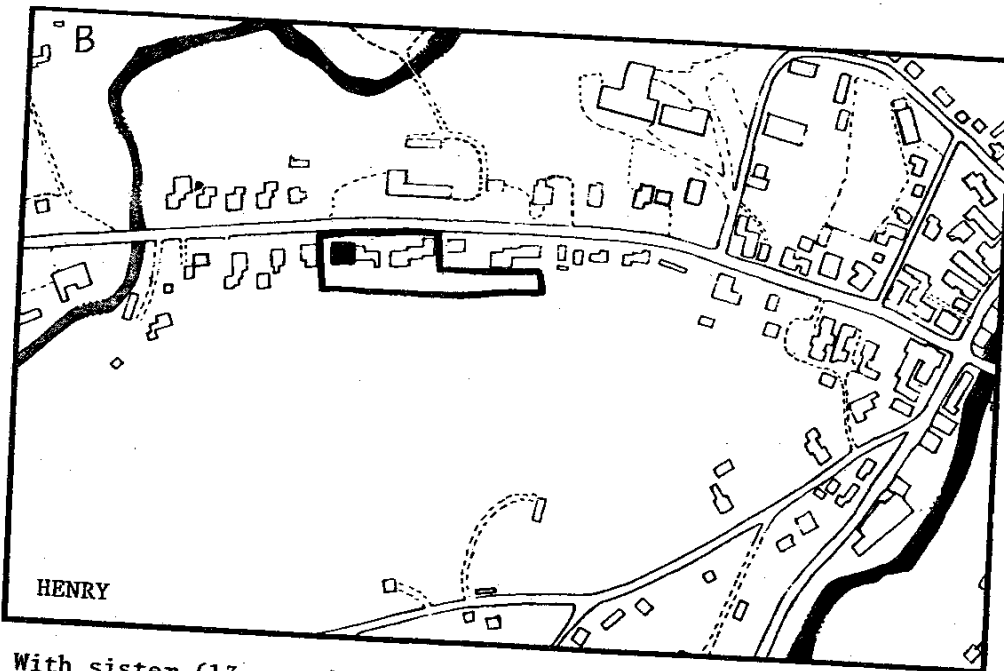
September 8th, Friday 5PM. The return to school two days ago has had a dramatic effect upon changing the pattern of children's social interaction and consequently, upon their spatial behavior. Beckie has spent the last two afternoons after school with her classmate Annie Watson at her home on North Hill Road. On this second evening she had risked lying a little in order to achieve this new visiting freedom. She claimed that she had been invited by Annie's mother but in fact she and Annie had called from the telephone box at the post office across the street! In this way she has avoided having to ask her mother and risk being refused.

Enid Alcott (6)

Immediately west of the Clemen's home, within the same apartment building live Enid, her parents and her baby brother. Enid's free range is extremely small (Map Figure 8-5A). It extends across the 15 feet of grass in front of her apartment building and the 20 feet of grass in front of the neighboring apartment building, to the sidewalk. In addition, Enid is allowed to use her tricycle along the sidewalk for about 200 feet in either direction, in each case to a house which has been designated by her mother as a boundary marker. The Alcott family had only been resident in the home for three months before this range interview was conducted, so there had been little opportunity for either parents or child to learn the dangers and to negotiate a liberal range. But Mrs. Alcott volunteered another explanation for the tightness of Enid's range. One mid-day in July, while Enid and I sat on the porch going over her diary record for the morning Mrs. Alcott explained:



Walks elsewhere in town with mother only.



With sister (13 years) anywhere in town.

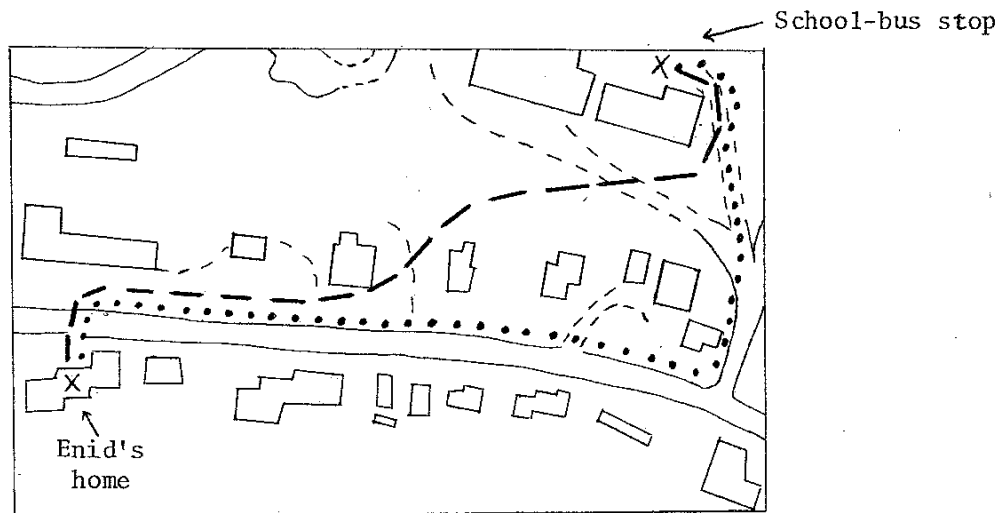
FIGURE 8-5: ENID (6:3) AND HENRY (7:5) RANGE RESTRICTIONS

— Free Range

" I think I've been very strict with Enid because she is my first and I'm over protective. I know I'll be different with the new child."

But she also explained that she feared the traffic very much and that this was a prime reason for wanting to move to a house out of the town as quickly as possible. Enid depends upon her parents for taking her outside of her small "free range." As with most children under eight years of age, her mother does not work, and is able to watch over Enid and take her out on shopping trips and social visits. One July week from Enid's diary illustrates this pattern (Map Figure 8-6). Seven separate trips were made along Main Street, trips which always included shopping visits to stores and visits to the post office for mail. These trips commonly also included social visits to the homes of other women who were at home with young children. In addition, at least one weekly shopping trip is made to Grandville or Middleton. Typically Enid joins her mother on this trip to Grandville. Enid also traveled with her mother in the car to see a fire in the south of the township and made the common weekend visit with both parents to a relative's home.

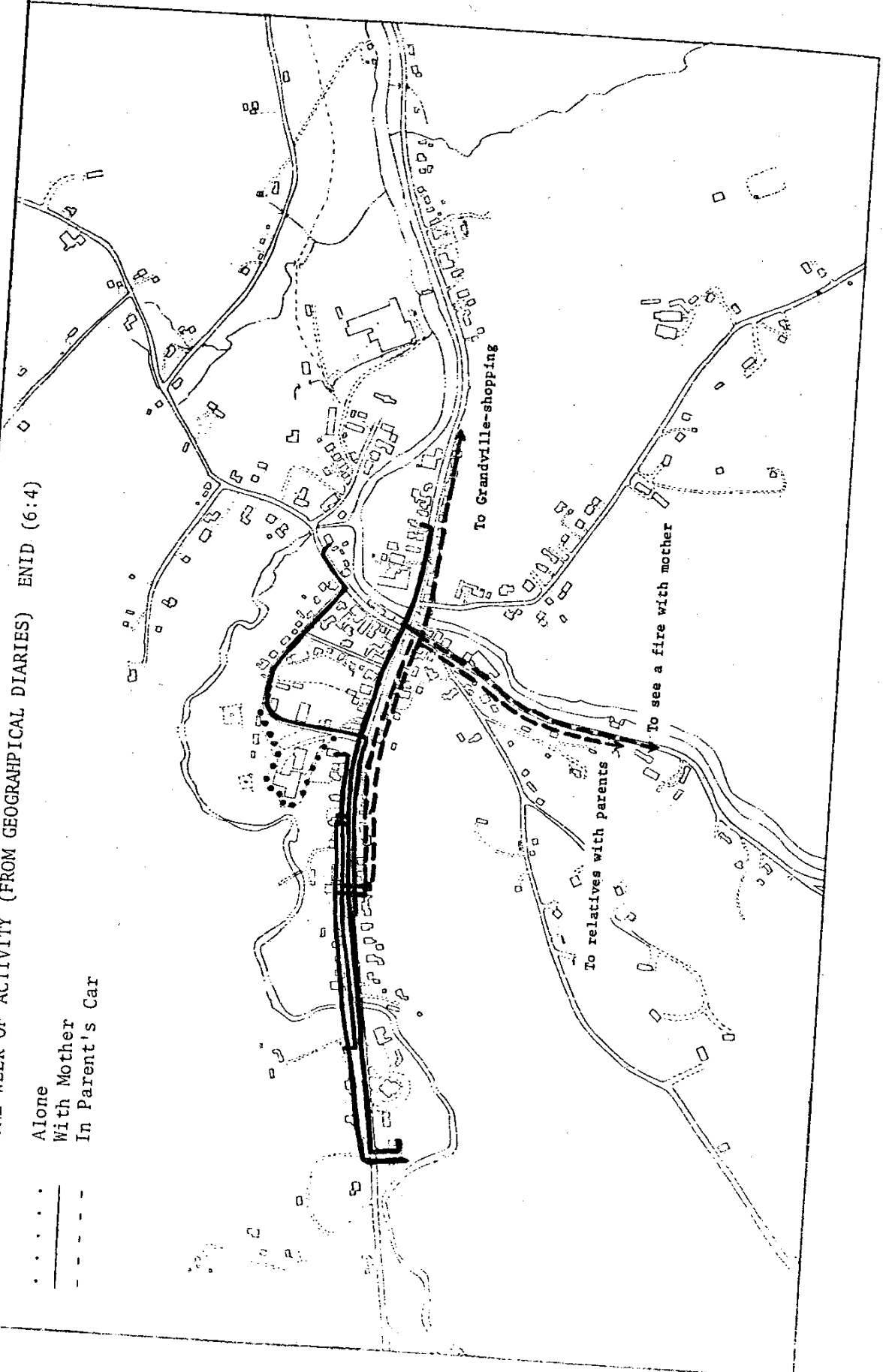
A particularly interesting feature of Enid's spatial behavior was the ritual nature of her route to and from the High School where she caught the school bus each morning. One spring day, the Clemens and Stevenson children, with whom she usually walked to the High School, re-discovered a short-cut which they had not used since the previous summer. This route took them via the post office yard to a hole in the hedge which led to the rear of the High School. Tom and Beckie tried hard on the first few mornings of taking this route to persuade Enid to join them but Enid resisted very strongly. She insisted hers was the way and she continued using the more circuitous school street route.



..... Ritualized Route
 - - - - - Short-cut

FIGURE 8-6: ONE WEEK OF ACTIVITY (FROM GEOGRAPHICAL DIARIES) ENID (6:4)

- Alone
- With Mother
- In Parent's Car



I learnt later from her mother that this fixedness in Enid's route was not the result of any severe rule on her mother's part, but was related to Enid's own fear of going off the known route; one way of dealing with the new, busy and often confusing world of the kindergarten school year. Her mother told me in July that during one of their walks around the village the week before, she had responded to Enid's strong urgings to explore this route. She watched while Enid ran through the hole in the hedge and came back. After this experimental exploration, Enid returned home via this route while her mother continued round the longer School Street route with her baby and pram. In her own relatively safe way Enid had explored the territory she had apparently really wanted to know. Going out when one is almost sure that it will be easy to come back is an exciting game with rich rewards for coming to know the world.

Henry Hudson (7)

I learned from an informal discussion with Henry in May that when playing out of doors he was required to stay in front of the house so that his mother could see him. His "free range" at this time therefore was similar to Enid's (cf Map Figures 8-5A and 8-5B). Also, like Enid, his mother remained at home during school vacations and weekends to watch over him. When she was unable to do so, Henry's 13 year old sister took charge. By the end of the summer, Henry's range had been extended to the field behind his house and to the wooded bank behind the Clemens' house, but it was understood that he would always be with the older children at these times. Beyond this "free range" he could go nowhere unless accompanied by a parent or his sister. Henry had made a number of trips with his mother and sister, to the center of town to shop, and to visit friends and the barber shop. On December seventh of my second year I noticed him crossing Main Street alone. I asked him how long he had been allowed to do so and he explained that he did so for the first time the previous day because his sister was sick and could not go with him to the supermarket. On this day he was going to buy donuts for her. It is usually through such very specific errands that children come to expand their range; it seems as though the mother is putting her child through a training period before truly liberalizing her hold on the child, but whether or not this process is one which is consciously planned by the mother remains to be discovered.

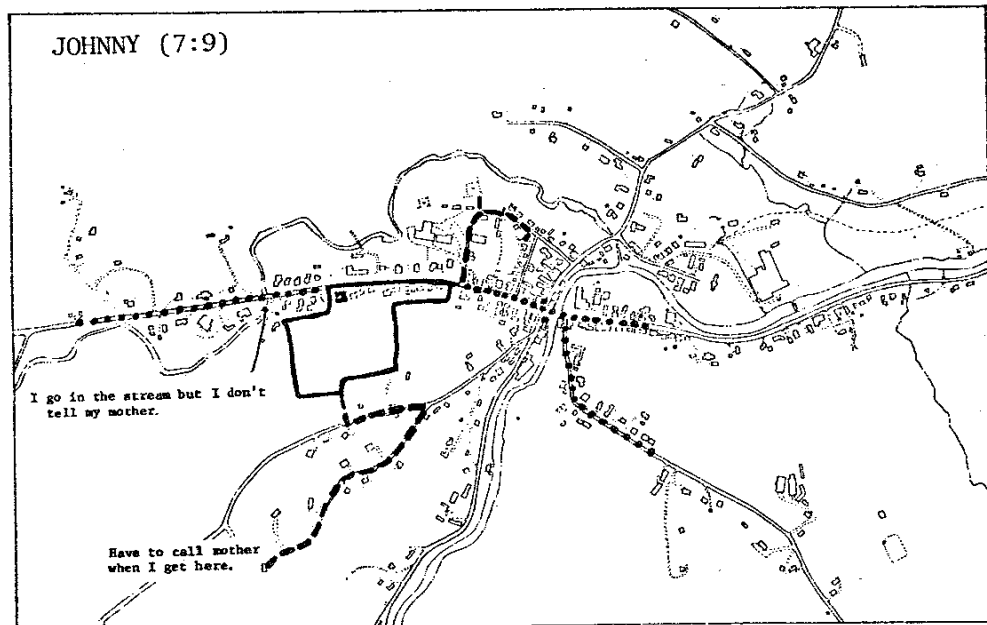
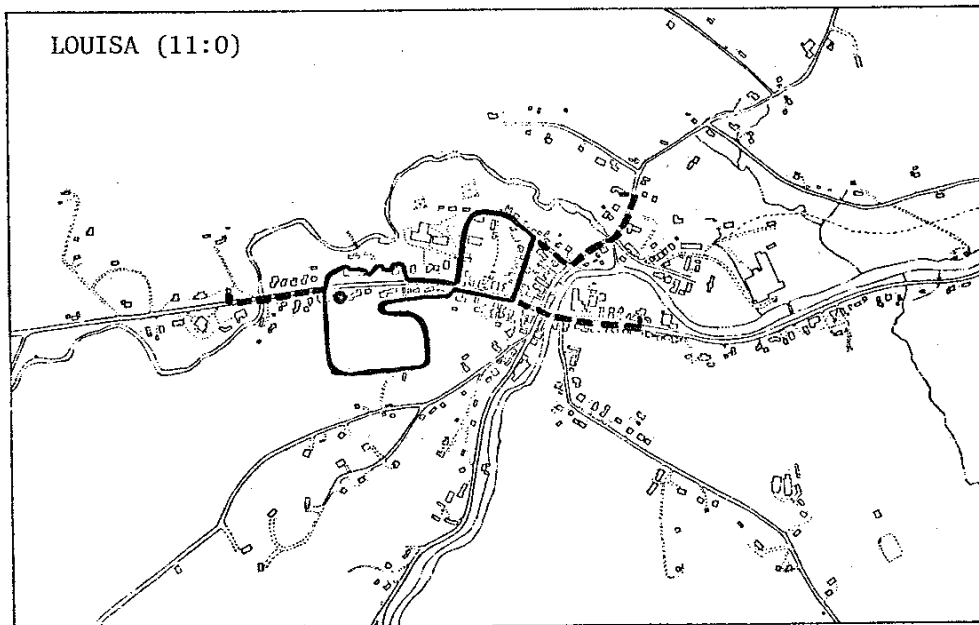
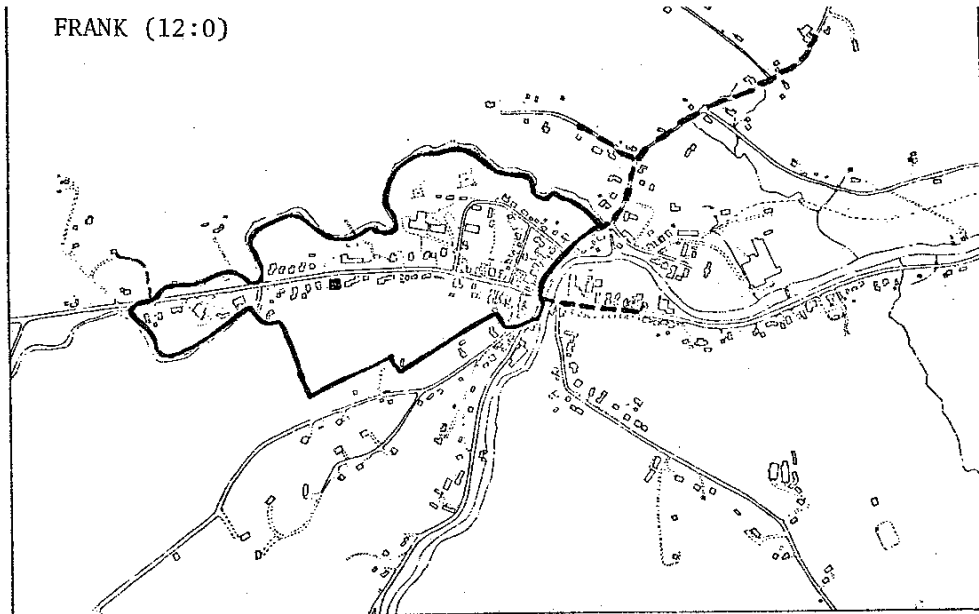
Johnny Stevenson (7)

Johnny's mother works on week days in an office in town, but she makes herself available should he need to call her. Responsibility during vacations is left with Johnny's older sister, Louisa (11). It is standard practice in this town to leave the child-care responsibility with a girl in the family even when there is a son of equivalent age or older, as is the case here with Frank (12), Johnny's older brother. Johnny's free range is limited to the lawns and sidewalk in front of his house and the houses of his neighbors as far east as the house of Mr. and Mrs. Maple's, the old couple who befriend this group of children (Map Figure 8-7). He may play anywhere in the large field behind his house but is instructed not to roam to the east of the fence, into the area with the wells. This was a rule which he occasionally

FIGURE 8-7: STEVENSON FAMILY - RANGE RESTRICTIONS

Free Range
 Range with Permission
 Range with sister 11:0

—
 - - -



broke along with Tom and Beckie because they felt confident knowing the location of the wells.

Crossing Main Street was forbidden without the permission of a parent or of his sister Louisa during the daytime when neither parent was home. Louisa was to limit him to trips to the supermarket for soda or candy. Like the other children of the group, he was allowed in the evenings and Sundays to cycle in the Universal Supermarket parking lot. It was probably because of this limited opportunity that Johnny had not learned to ride. Johnny was allowed to walk alone to his mother's office when this was prearranged and occasionally, if other children were there, he could play on the ball field for a while. Similarly he could walk up through the fields behind his house to a friend's home on Greenlawns Hill, provided that he telephoned as soon as he reached the destination. Similar arrangements were made in the reverse direction by two Greenlawns Hill girls wishing to visit the two West Main Street girls living next to the West Brook (see Map 4-11: "Children's Paths and Short-Cuts").

For trips to the town center stores, to the ice-cream stand, or just for a walk along Main Street, Johnny had to have both his mother's permission and the accompaniment of his sister. His love of brooks and rivers had led him on occasions to explore the West Brook even though this was specifically forbidden by his mother. Unlike Tom, he was not caught during the summer, but in the following spring he really over-extended his limits. He was found wading in Trout River under the town center bridge by his mother and was severely reprimanded even though he had been there with his elder brother. As with other mothers, the rivers are a cause for considerable fear for their children.

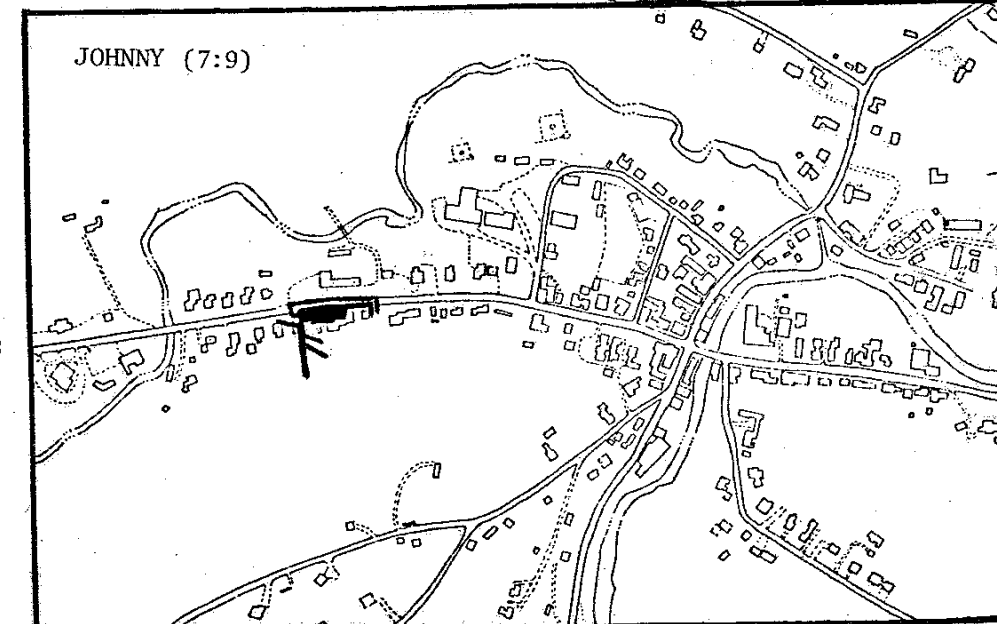
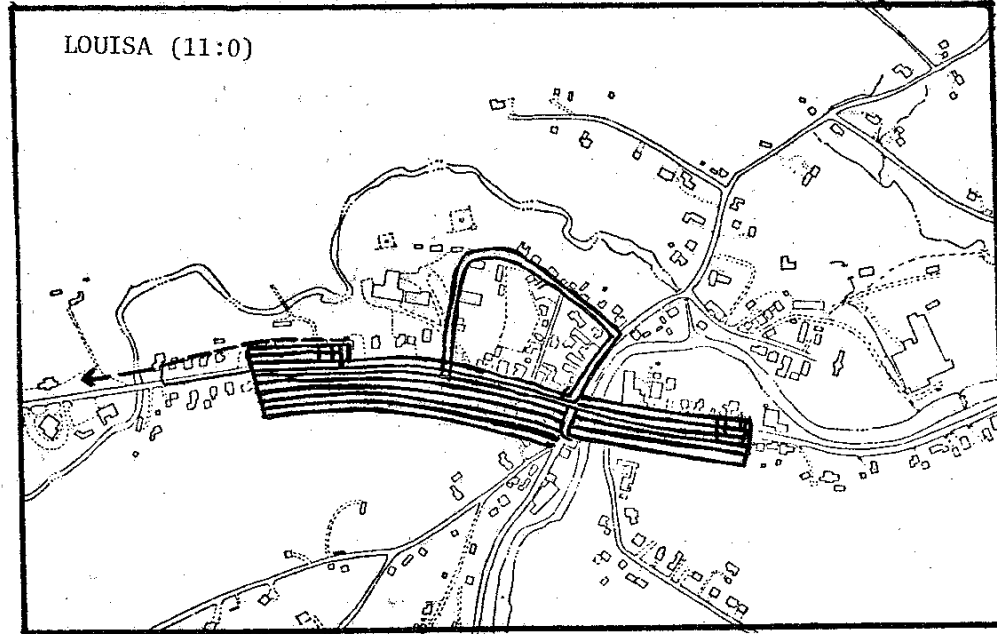
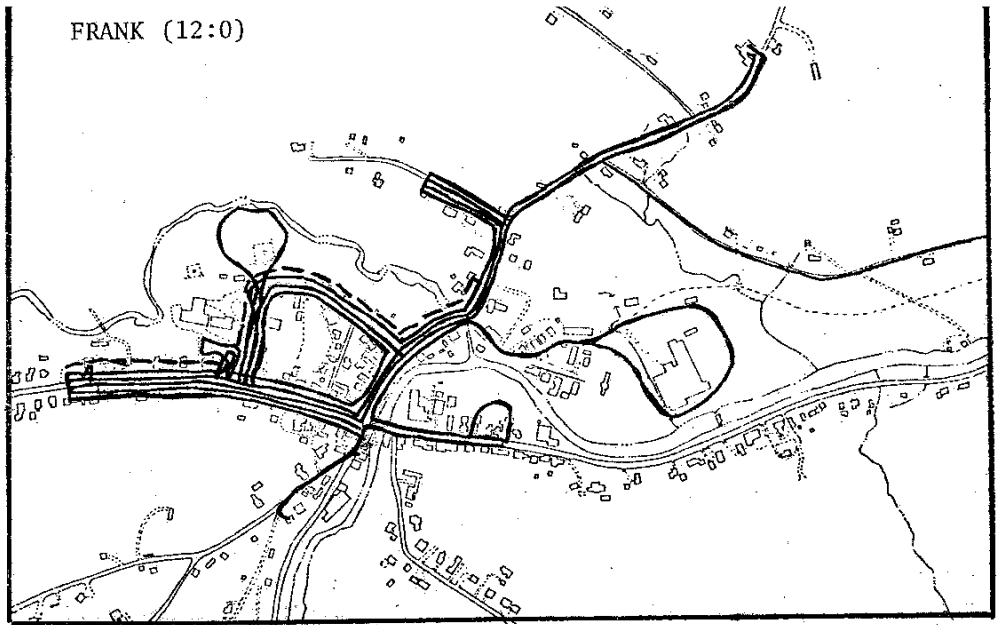
During the week of diary keeping, all of Johnny's trips were made within his "free range" (cf Map Figures 8-7 and 8-8). As can be seen most of the activity was on the front lawn and sidewalk. Perhaps this was partly because the front lawn was mown and the back field was not, but one might argue that the front lawn has a slope down to the road, and is hence unsuitable for any ball games. The major reason for use of the front lawn it seems, is that from there children can observe much social activity and can see and be seen by other children who are visiting the supermarket, or passing by. In this way the West Main Street children maximize the chances of finding extra playmates--an important resource to children with tightly prescribed spatial ranges. Johnny's small range of activity contrasts markedly with that of his sister Louisa, and brother Frank, for the same week (Map Figure 8-7).

Louisa Stevenson (11)

Louisa's range was of course more liberal than Johnny's, but considerably less so than her brother Frank's, one year her senior (Map Figure 8-7). She was allowed to cross Main Street to the supermarket and the post office and to her mother's office in order to run errands, but visits to such highly favored locations as the downstreet stores, ice-cream stand, and girlfriends' homes still could not be made without first informing her mother. Fortunately, her mother was easily available either by visit or phone call, and, as the map record from the first week of her diary record shows, she traveled frequently to the downstreet stores. The regularity of this pattern was typical for

FIGURE 8-8: ONE WEEK OF ACTIVITY (FROM GEOGRAPHICAL DIARIES) - THE STEVENSON FAMILY

— Alone
- - - In Parent's Car



girls during the summer vacation because so many of their trips away from their "free range" were on errands. With Louisa, these errands were often requested rather than directed but the resulting repetitive spatial pattern was the same. Daily trips were made to the supermarket, post office, town center stores, East Main Street store complex, and town center restaurant to buy snacks for her mother. The only places beyond this to which she ever travels unaccompanied are the ice cream stand and a family on North Hill Road for whom she babysits. As is true with most families, Louisa more frequently than her brother, accompanies her mother on shopping expeditions to Middleton or Grandville.

Frank Stevenson (12)

Though only one year older than Louisa, Frank's free range is considerably larger (Map Figure 8-7). This was, no doubt, not the result of specific spatial planning by their parents but of a number of interrelated factors. First, Louisa was unquestionably the caretaker for her younger brother Johnny. Frank was expected to help around the house, and especially help his father on weekends, but he was not expected to watch over Johnny. Second, unlike Louisa, Frank had a bike of his own and could easily extend his range by quickly cycling up to a store or to a friend's house. Third, Frank's personality was different from Louisa's; he had more friends, while Louisa often seemed more content to stay at home and read or write. It would be unrealistic to attempt to partial out these various factors but one crucial overriding difference between Frank and Louisa's activities must be stressed because it is an important common difference between brothers and sisters. Because of her caretaking role, Louisa's time was restricted. She could not go where she wanted when she wanted. True, with permission she could reach many of the resources she needed but this is a qualitatively different way of making decisions than that granted to Frank who could cycle here and there in town in response to the slightest of whims. Unfortunately, no systematic data on time expenditure was collected as most of the children were unable to keep accurate time budget records (1). While no direct comparison can therefore be made with Frank's time expenditure during this diary week, Map Figure 8-8 of his activities adequately reveals how much more free he was to meander on his bike to friends' homes, around the ballfield, driveways, and the factory (actually out of bounds).

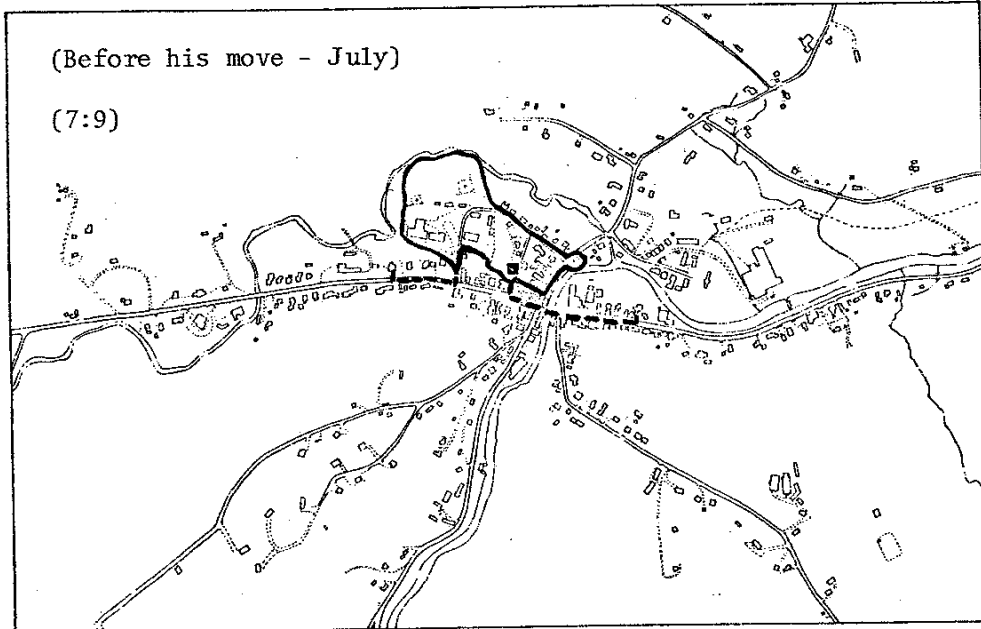
1 Louisa and one other girl of similar age were the only ones who chose to write down specific times of day on their geographical diary sheets; other children found such detail unnecessary; it may be that younger children have less consciousness of time. Alternatively, these two children, as with other similarly aged girls both have a number of chores to do around the house at specific times (e.g. bringing lunch to mother) which may introduce a greater time awareness. Unfortunately, no time budget studies of children are known to the author which could answer such questions.

Clark Collins was interviewed twice about his spatial range of activity, once, in July while he lived on Field Lane in the town center and once in October, after his move to West Main Street. The effects of the move upon his spatial range clearly highlight some of the points made above and in the general discussion of spatial activity (Chapter IV).

Most noticeable of the differences is that the size of Clark's free range was reduced (Map Figure 8-9). This we would expect for both parent and child had not yet had time to learn the new environment, its attractions, its repulsions, and its dangers. Clark revealed this himself by the way he described his "with permission" range: "I think I can go to the ice cream stand but I don't know because I haven't tried to go alone yet." Another factor explaining the smaller extent of his new free range is that the West Main Street houses suffer from the busiest traffic in town. This was the only aspect of the house move which Mrs. Collins had doubts about. Its most obvious effect upon Clark was to reduce his cycling activity completely to the sidewalk on the north side of West Main Street and to the Universal Supermarket parking lot during off-business hours. The most serious effect of the move in Clark's mind seemed to be that he was no longer able to visit the East Main Street commercial strip with its diverse collection of candy and toy stores. The primary reason for removing this set of places from his range of unaccompanied movement seemed to be that his West Main Street peers were not allowed to go there. Logically it made little sense for he was allowed to cross West Main Street and nothing more hazardous was involved in the trip than he had experienced in travelling there from his previous home. This is I believe an example of the social conformity which comes when relatively "open families" (see Chapter IV) live in close proximity; the parents set up some relatively common standards or rules for all of the children of the neighborhood to follow; if a very different set of rules is developed for such an important child-care dimension as spatial range, it is a way of saying to the other families that you are not "open" to them, not a part of their spatial system.

Mike Collins' range is not expressed in map form because when I interviewed him, so soon after his move to the new West Main Street house his free range was limited to the front and back garden and his range with permission was limited to the front and back gardens of the Clemens and Stevenson families. I have no data of Mike's range before he moved because he was not then attending school and so was not interviewed. Gradually over the following year Mike's free range expanded to include the front and back gardens of his neighboring friends and so was similar in shape and size to Henry's range by the summer.

The two children of this family and Enid Alcott, also of Main Street, present an interesting issue in terms of children's spatial range and their interactions with the environment, that is, moving homes during childhood and its effect on children's coming to know and growing competence in dealing with, the environment.



With sister (12 years) anywhere with permission

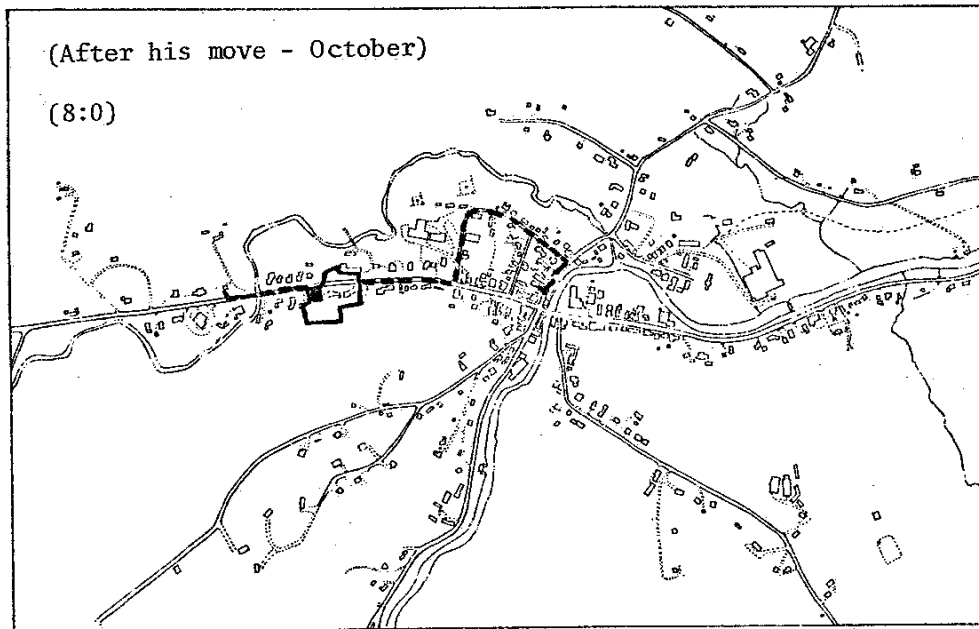


FIGURE 8-9: CLARK - RANGE RESTRICTIONS

———— Free Range
----- Range with Permission

Place Knowledge

During the first winter and early spring, when all of the school children were constructing their landscape models, two of the West Main Street families of children had not yet moved in. Their representations were of their own home landscapes elsewhere; with the exception of the Universal Supermarket stuck at the end of an arbitrary strip of road, West Main Street was not mapped by them. It seems this was not a part of their structurally cognized landscape. For this reason, they were not included in the following discussion. Three more of the children of these five homes, Frank (12), Jane (12), and Louisa (11) did not construct landscape models or participate in the place recognition test because they were in the fifth or sixth grade. Consequently the map reproductions of the landscape models of only four children are available for comparison here: Henry (Map Figures 8-10 a and b); Johnny (Map Figures 8-11a and b); Tom (Map Figures 8-12 a and b); and Beckie (Map Figures 8-13 a and b). Due to technical reasons there is no record of Henry's performance in the place recognition test.

All four landscape models are advanced in that the children were each able to construct, at a minimum, an integrated representation of West Main Street and the journey-to-school. However, both in the areal extent and in the degree of spatial organization of the models, there is considerable variation. Some of this variation can be seen to relate to the different spatial opportunities these four children have had, while some is undoubtedly related to their different intellectual competencies with regard to spatial organization.

Henry (7), like Davy in the following chapter, demonstrated that children of first grade age can produce very sophisticated maps of their home environment. One of Henry's positionally organized areas (the road to school) even lies outside of his own free pedestrian range. No doubt because he has walked along this road a number of times to his father's work place he has been able to link this experience to his school bus journey. A major key however to Henry's successful mastery of the town's spatial structure, is I believe, his use of the town crossroads as his starting point and overall organizing framework. Only after laying the crossroads out and hanging a stop light, did he begin his search for a red block to serve as his home. The stretch of road between the town center, which he had walked to many times with his mother and sister, and the school area, with the farm which he had also visited twice was in fact impoverished. But, because he had occasionally walked to the barber shop and to the church and the restaurant with his mother, he at least knew that they lay on the same road as the road taken daily by his school bus. This place association coupled with the reconstruction of the highly imageable town crossroads enabled Henry to produce a model more sophisticated than many less well-traveled children two years his senior. As is the case with many of the models, there are no named places between the edge of his home pedestrian world at the barber shop, and his school pedestrian world at Meadow Farm. From his school bus journey between these two areas Henry seems to have learned nothing except that they are linked; typically, also, the journey is represented as a very small distance on the model. Similar environmental experiences by Henry effected his representation of North Hill Road. While Henry has visited the two classmates living just north of the crossroads on foot, he only knew from visits in his parents car where Helen lived and so he was only able to place it

somewhere up this hill; the perpendicular turn on to Wood Lane had not been mentally registered by him. Whether or not the correct placement of Helen's house on the lefthand side of the road was the result of chance or a decision I cannot say. But certainly Henry would be much more involved with the environment, in an active perceptual manner, as the car enters Helen's driveway and as he makes the decision to step out of the car, than he would during any part of the passively experienced car journey, such as the bends or turns in the road. I suggest that because of this we would expect Henry's awareness of the immediate positional relationship of Helen's home to the road to be superior to his awareness of any spatial qualities of the journey itself.

Johnny (7) constructed a more impoverished model than did Henry (7), but one which nevertheless portrays equally well the basic structure of a large portion of the town. Unlike Henry, he began by mapping his home and the places across the street and then, by re-tracing the journey to the town center, North Hill Road, and Snowdon Road with his feet, and pointing with his toes, he mentally re-created the remainder of the town before laying down the strips of road. All places shown on this map except the Elementary School and neighboring gas station had been visited on foot either with his elder sister or brother. On North Hill Road he mapped his highly valued old kindergarten (church school), the library statue on which he has played so many times while there, and the home of his family's "closest" friends. From these friends' homes he has occasionally walked up the hill with his sister Louisa and recalls the home of the two schoolchildren on the corner of Lake Road which children commonly remember as the landmark for the turn on to this road. (cf. Chapter V: "Place Knowledge"). Greenlawns Hill had been visited on one occasion with his brother and once or twice in a teacher's car. Because of these visits, Johnny was able to name the road as it turned off Snowdon Road, and to say which children lived there, but he could not locate their homes.

The greatest incongruities between Johnny's landscape model and place recognition performance are East Main Street/Grandville Road and Plum Hill. While building the churches in the center of town he had explained that, "I could show Grandville Road but I don't know it very well." As always I encouraged him to do as much as he could but he clearly only wanted to lay out those places he was confident about. Towards the end of his modeling, I asked him about the two Hills (Greenlawns Hill and Plum Hill) which he had mentioned. He replied with a don't-be-silly air, "Well, I can take you there but I can't build them for you." He finally did add a strip of road to symbolize Greenlawns Hill, but Plum Hill was not attempted. Looking closely at his responses to the four color transparencies of this hill, it becomes clear that while he correctly identified the hill he knew nothing about it other than where it began. Slide No. 1: "That hill--at the Bridge Diner." Slide No. 2: "That hill again." Slide No. 3: "The hill again." Slide No. 4: "That hill again." He did not recognize the homes of two of his classmates on this hill, and with probing, I discovered that he did not know they lived on this hill; neither did he know where it led. His instantaneous recognition of the hill on the transparencies it seems stemmed from one trip he had made in a truck during the town's spring clean-up day. It seems that while children are unable to spatially relate places experienced from a moving vehicle, they have excellent opportunities on these occasions to perceive and store images of places. It is no doubt for this reason also that Johnny easily recognized places on Snowden Road past the school but did not include them in his landscape model.

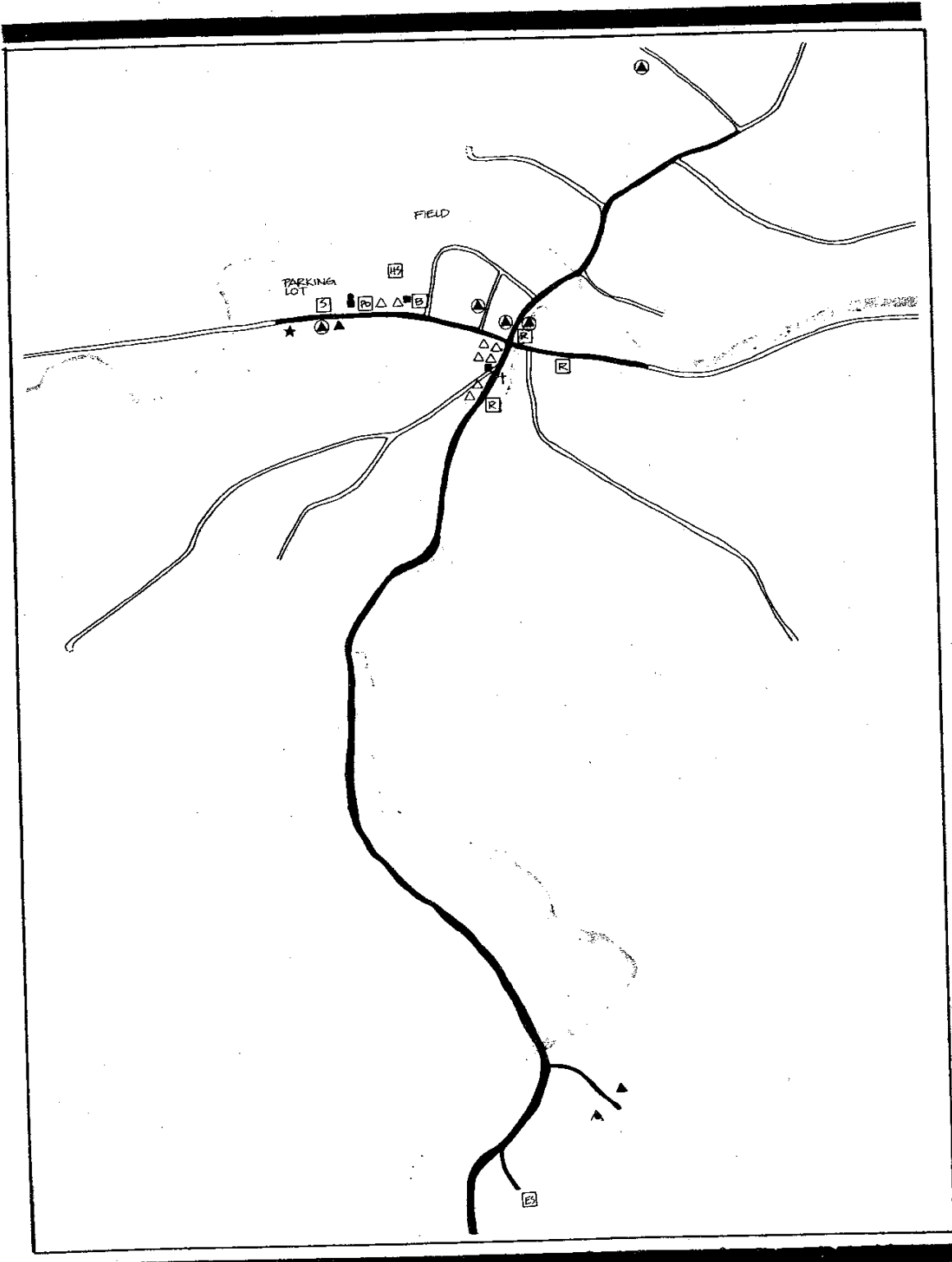


FIGURE 8-10a:HENRY(7:5)-CONTENT ANALYSIS OF LANDSCAPE MODEL

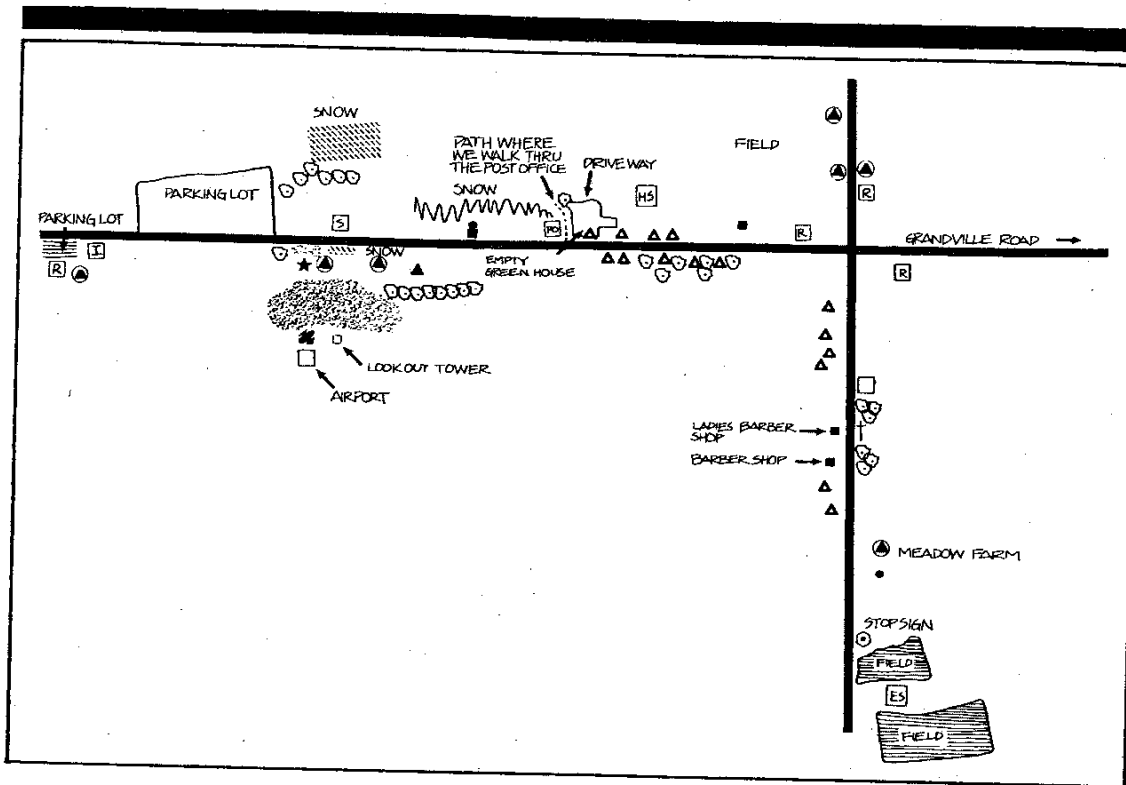


FIGURE 8-10b: HENRY (7:5) - LANDSCAPE MODEL

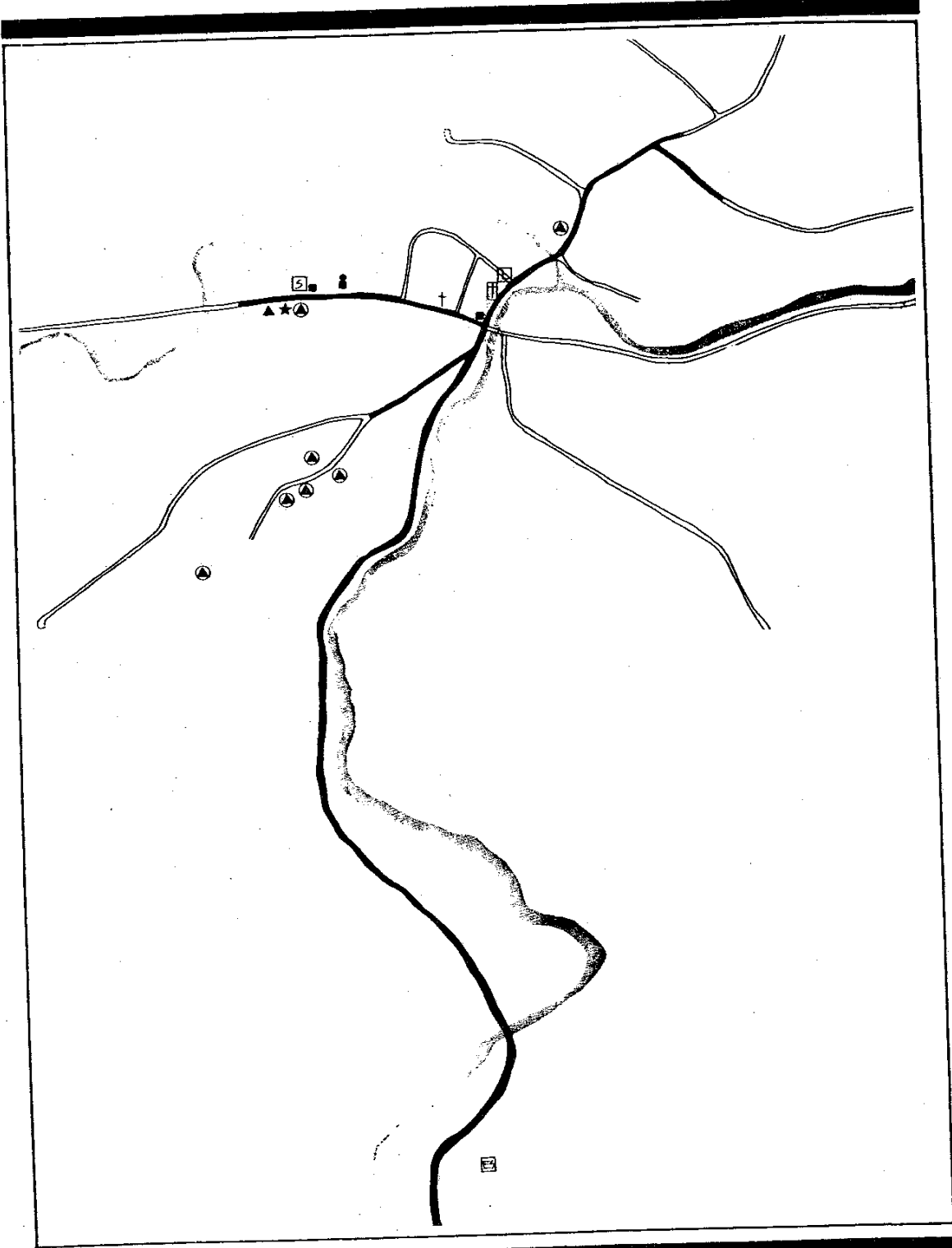


FIGURE8-11a:JOHNNY (7:9)-CONTENT ANALYSIS OF LANDSCAPE MODEL

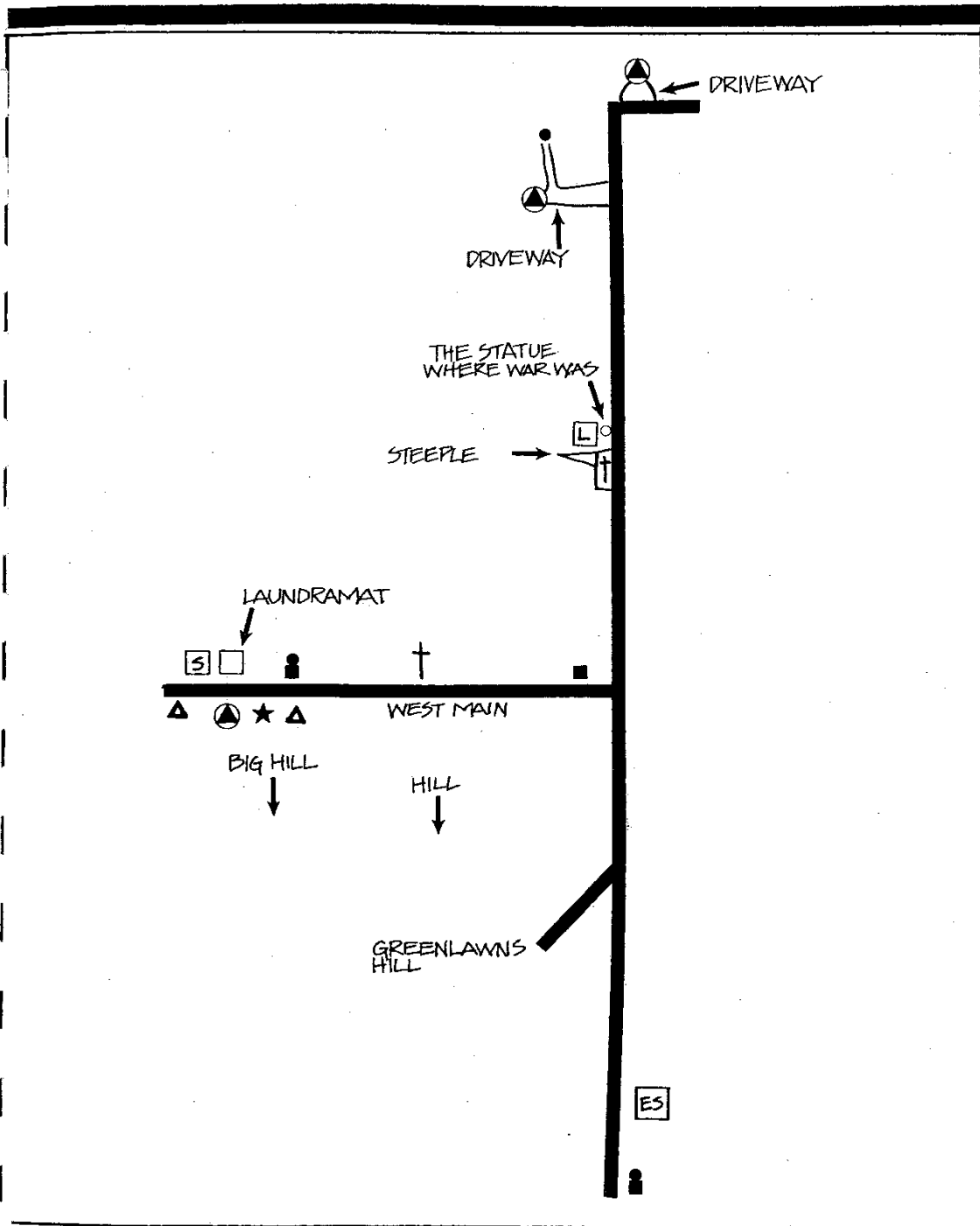


FIGURE 8-11b:JOHNNY (7:9)-LANDSCAPE MODEL

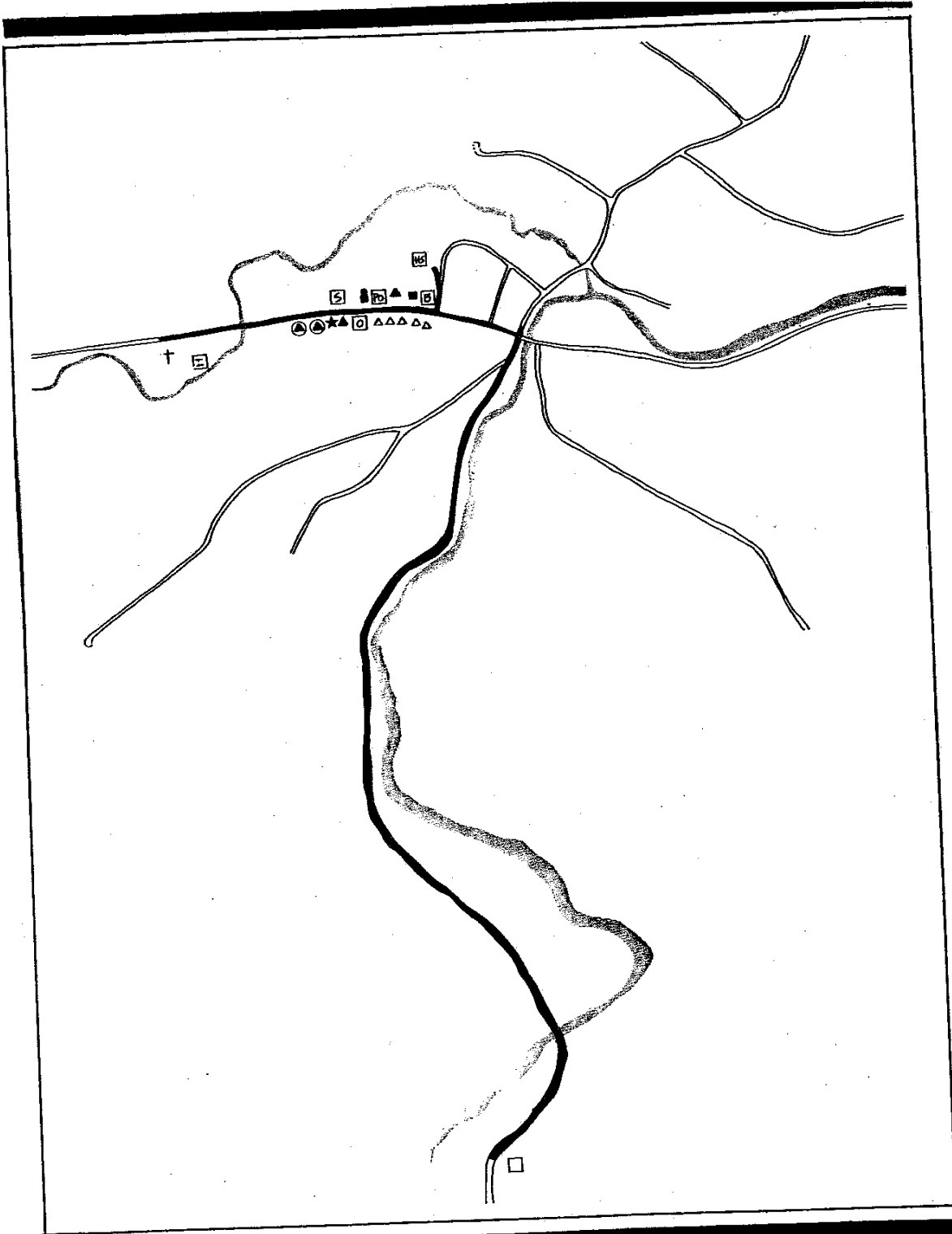


FIGURE 8-12a:TOM(8:5)-CONTENT ANALYSIS OF LANDSCAPE MODEL

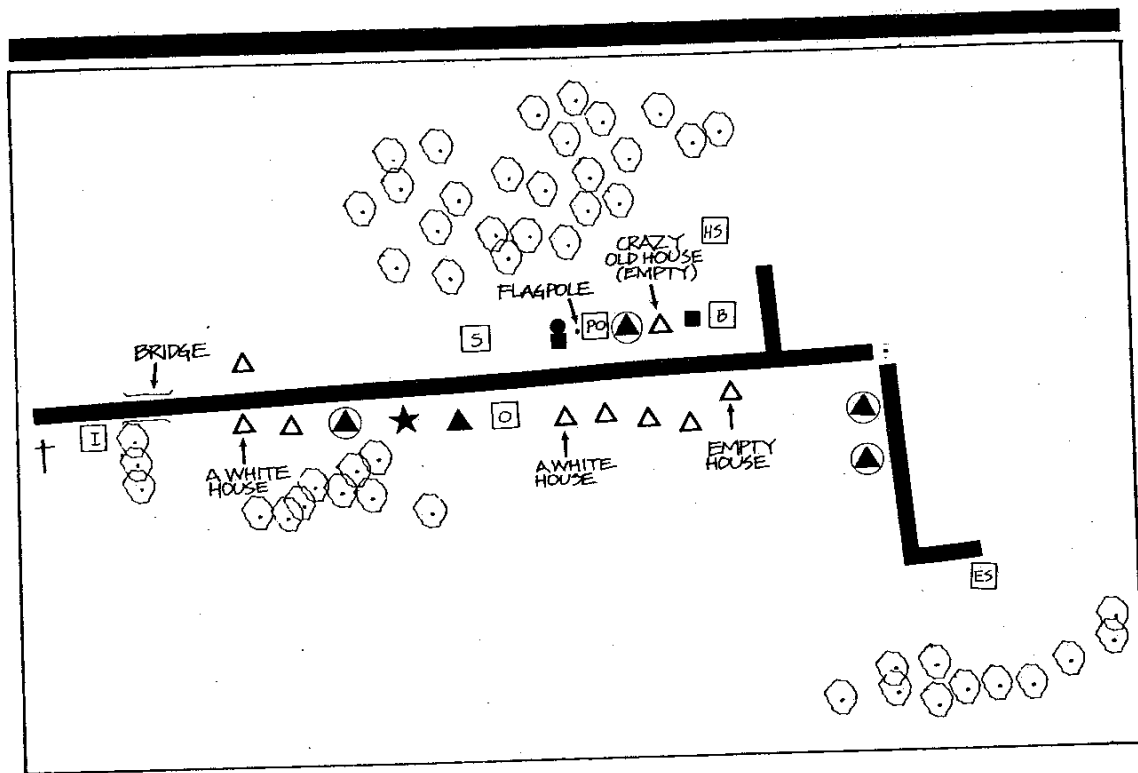


FIGURE 8-12b:TOM(8:5)-LANDSCAPE MODEL

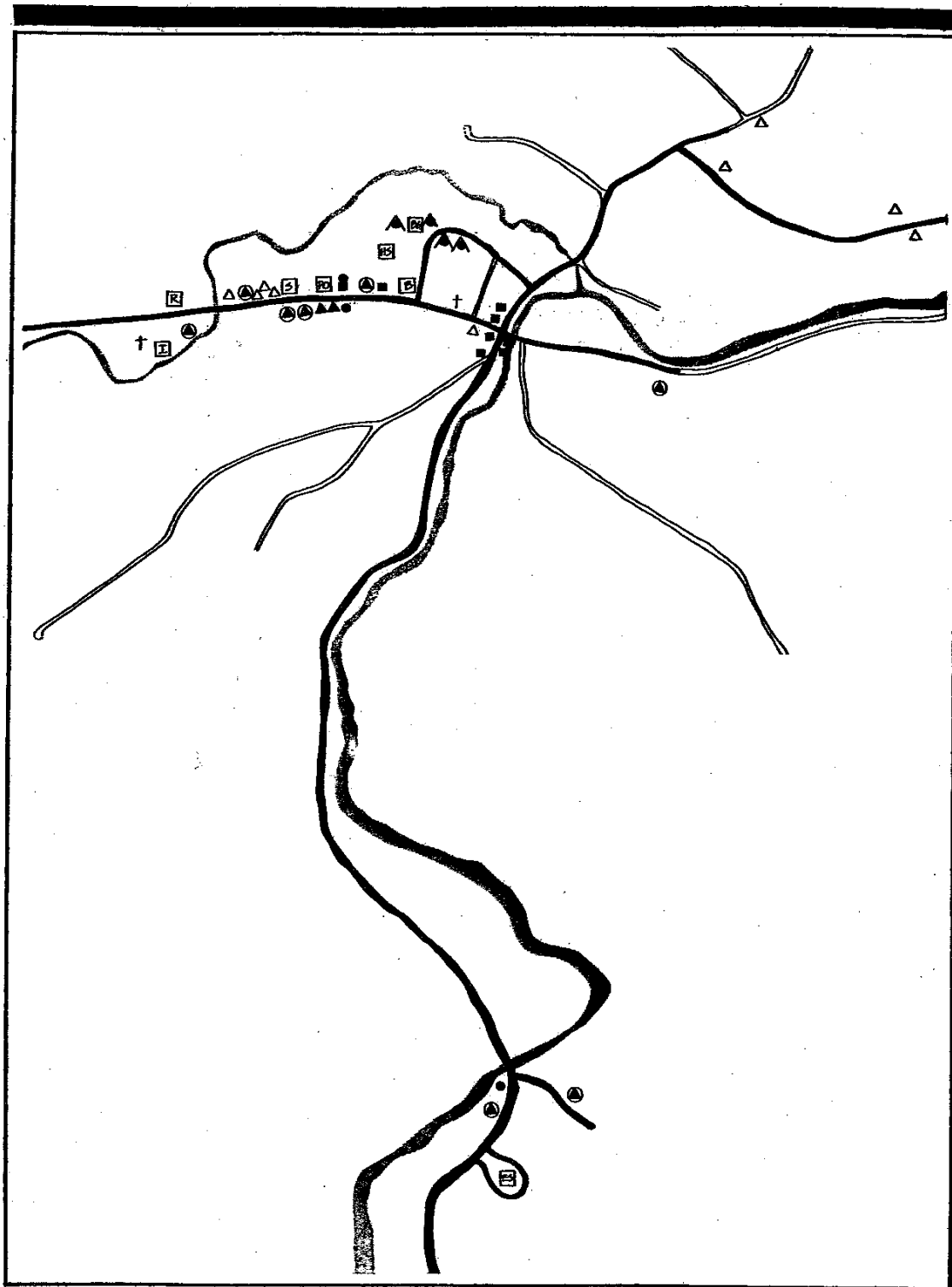


FIGURE 8-13a:BECKIE(9:6)-CONTENT ANALYSIS OF LANDSCAPE MODEL

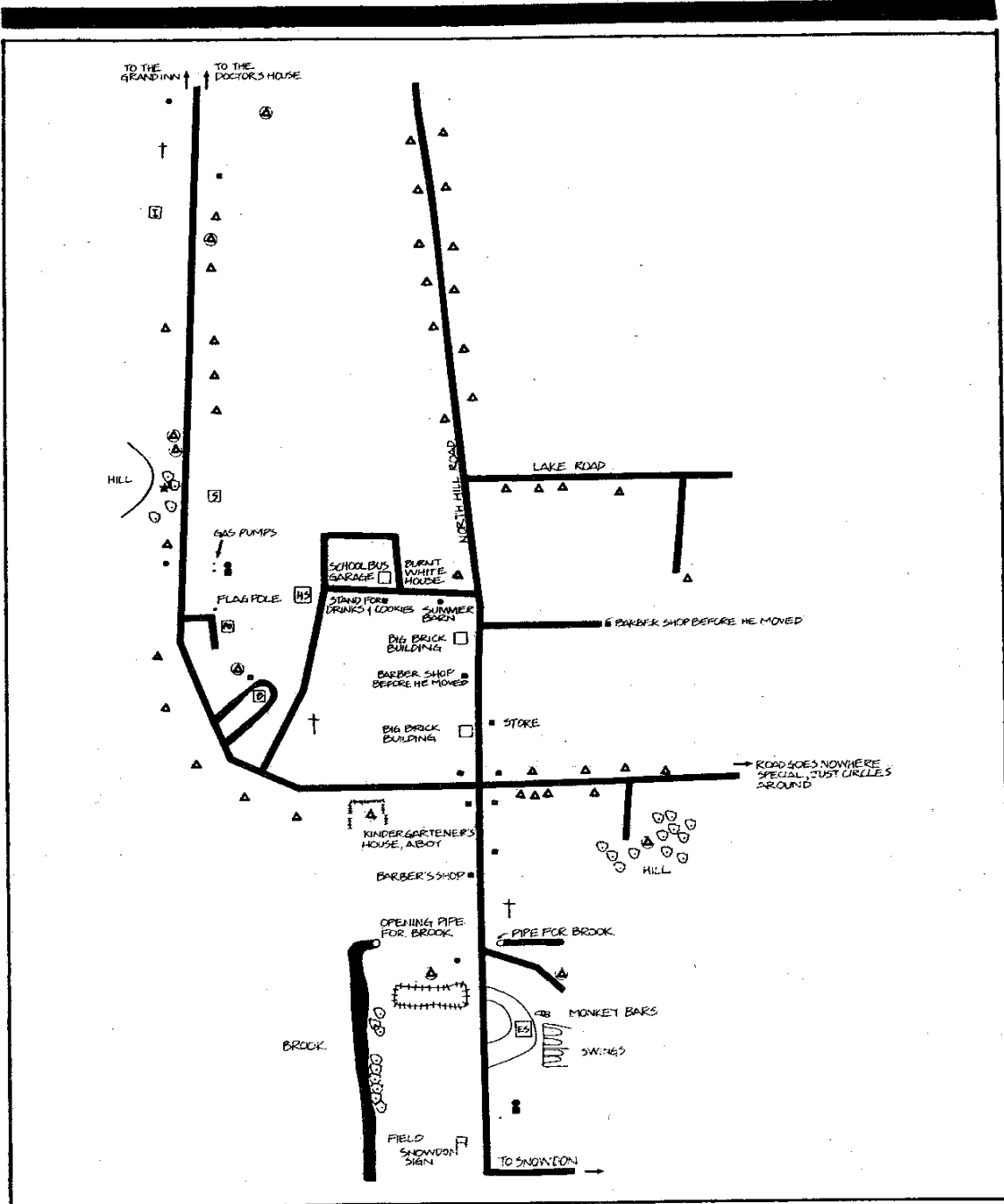


FIGURE 8-13b: BECKIE (9:6) - LANDSCAPE MODEL

It is interesting to ask why Beckie (9) and Tom (8) who had the same spatial range in the spring and went to places almost always together, should have produced very different landscape models. Tom's model is inferior to Beckie's in terms of extent, complexity, and detail. I suggest that this difference is partly the result of Beckie's seniority by more than a year which enabled her to bring to her place experiences a more advanced ability to mentally manipulate them, and assimilate them into a more embracing representation of the environment. Tom's model was largely linear; it had only two road turning off it; and no enclosures. Beckie, by comparison, was able to construct not only the basic cross structure of the town, but also the block of streets surrounding the High School. Beckie's superior performance on the modelling task might also have been related to the very different nature of their social geography for Beckie hardly ever misses a chance to run an errand, visit a friend with her elder sister, go to a party, or to a High School basketball game, etc. Tom may do some of these things but usually with the leadership of Beckie. He has a shyness with people that leads him to retreat from events with all but his closest friends and family; Beckie is anxious to reach out to make contact with as many people as she can. However, this interpretation seems unlikely for the performances by Beckie and Tom on the place recognition test were almost identical. This suggests that Beckie's superior modelling performance is more likely an expression of intellectual superiority than of greater familiarity with the town. As with Johnny their area of recognized places coincides closely with their spatial ranges and so, Johnny's superior performance on the place recognition task is a reflection of the greater spatial freedom he is granted.

It is surprising that Beckie and Tom and Johnny did not include either the brook or the river on their models for these places are highly valued by them. Explanation probably lies partly in the methodology and partly in the great difficulty of the representational task. First, while I provided black strips to serve as roads, I did not specifically provide any material suggestive of rivers, such as the blue ribbon of Piaget's experiment (Piaget, et al, 1960). But because almost all of the fourth grade level children drew rivers on their models with the blue crayons, I must conclude that the prime reason for the absence of streams and rivers in the younger children's models is not the absence of suitable material, but the great difficulty of mentally representing the sinuous routes as they twist back and forth across the roads. None of these children had had the opportunity to walk along the river or stream; they had experienced them from five locations only: the West Main Street bridge, the ballfield, the town center bridge, the North Hill Road bridge, and the Meadow Farm bridge near their school. Quite likely Beckie and Tom, like most of their classmates, did not even know that these different sections of river were all connected. Johnny revealed while looking at a transparency of the town center bridge during the place recognition test that he had thought about this question: "That stream, I think, goes all the way down to the school. Well, it has to sometime because they're all hitched together and go all the way around the world. I don't know which way it goes though (i.e. which way the water flows)."

Beyond the Experienced Horizon

While driving south with me out of the mountains toward flat country, one day in March, Beckie recalled her vacation of the previous September in Pennsylvania. She explained that "Pennsylvania is flatter than Inavale: you can't see mountains from it." She had told me two days before that Pennsylvania was a bigger "town" than Inavale. She had in fact been visiting a suburban area of Philadelphia. It probably had no clear identity and unless her mother decided to make a specific point of it, it was quite natural that she should think that the small neighborhood of her cousin's home, that she got to know so well during the month of her visit, was called "Pennsylvania." Back in Inavale, whenever the relative's home is mentioned, it is called Pennsylvania. And when staying in their relative's home, there is no reason for the children to distinguish any towns or cities, for adults make all the decisions about going outside of the cousin's small everyday spatial range. By comparison, within this range, she and Tom came to know the locations and names of many places--friends' homes, swimming places, and candy stores. Tom was equally unaware of, and disinterested in, the locations and names of cities and states. This became clear to me in a discussion on my return from New York City in July. It seems that because he had heard me say many times that when I leave I go to Massachusetts and because this time I had said I was going to New York City, he assumed this was a city in Massachusetts. He seemed to know that places could be in Massachusetts, probably because it was a neighboring state and he had heard people say they were going shopping in different places there, but he seemed to have no generalized knowledge that a state was commonly larger than a city or town and that it could contain these. This often leads to considerable confusion when children transfer what they hear from adults. In August, for example, Beckie explained to me that her adult neighbor, Mary, was "moving to Greenhill; it's right near to New York." In fact it lies within her own state but is a little closer to New York State. I asked if she meant New York City or State, but she didn't know. She had assumed it was the same New York I go to (the city). The same confusion is true of the other children. While involved in the place recognition test in June, Johnny responded to the slide of the sandbox with: "Over that mountain is Washington, I know that." ("How?" I asked.) "Because my mother told me," he confidently responded. The following week, while chatting with him as he was building a town in the dirt of his driveway at home I asked him: "What is Inavale, a town or a state?" He responded: "A state I guess, because downtown must be the town." "O.K., is Inavale inside something else, like the United States?" "No," he explained, "because where the President lives is over the sandbank in Washington--you know, the sandbank across the street from us (his house)--and so that's the United States; that's what everybody tells me."

Place Feelings

Place Preference

Almost half of the favorite places selected by the children of the West Main Street group lay immediately around their homes. These local land-use places have been indicated on the Land-Use Map to be discussed under "Land-Use" (below), by underlining each place that was mentioned by a child (see Map Figure 8-14 below). None of the children limited themselves to this area

however. While they each emphasized land-use qualities they each balanced their choices by identifying at least one store and friend's house. Henry and Mike were not available to participate in the place expeditions and so are not included in the following discussion.

As a reflection of her extremely limited range of movement and the great value she places upon trips with her mother, Enid had selected the supermarket, laundry, post office, garage, ice-cream stand, and the school. In addition, she selected the baseball field (as the fair had just been in town), the tree fort, the brook, and Mrs. Maple's home. Louisa, Beckie, and Tom also chose the home of Mr. and Mrs. Maple, an older couple who lived one house to the east of them. They were loved because they talked with, and truly listened to the children at any time they visited, and perhaps a little bit because they always gave them cookies. This place lay at the limit of her free range. She spent almost all of her time within this range playing with the older children whenever they were willing. Together with Enid, Beckie, Tom and Johnny she also identified only two "land-use" places at the homes of children outside of the West Main Street group. Both possessed qualities missing from their own area: the children's ballfield on Greenlawn's Hill and a child's swing set on North Hill. Most of the remaining places were trees, "houses," fields, and good dirt play places around their homes (see Map Figure 8-14).

When I interviewed Clark at the end of September about his favorite places, he had only been living in his present house for one month. Although he had been well accepted into the new group of children by this time, four of his old play places still lingered in his mind as being important: the town sand-pile for jumping off and fighting on; the town garage for looking at the big trucks, and sometimes watching the men driving them, and two old friend's homes. Only two local places were mentioned: the apple tree behind his home (for climbing and throwing apples) and his neighbor's house ("because it was bigger and had a pool table").

From Jane's place expeditions I learned that, though she was usually away from home, her activities were very similar to those of her younger brother and sister. Most of her highly valued places lay within a few hundred yards of her friends' homes: an old barn across from Ellen's house, the rope swing behind Florence's house, the stream at Wendy's house, 400 yards west, the field behind Joan's house on Plum Hill, the hill above "The Mountain," where friend Dawn kept a horse, and the field behind Amelia's across the street. Additional places were standard town choices: the ballfield, sandbank, and the stream. The only home area place selected was a thick patch of pine trees up on the hill above the house which I think she had only explored once and wanted an excuse to visit while accompanied by someone who might not be as scared of pine woods as she was.

Frank's choice of places reflected his much greater freedom. Instead of visiting specific friend's homes and being subject to each of their local orbits around the home, he was free to explore the town on his bicycle, almost always with his friend John. Rather than identify land-use type places, most of Frank's selections were the homes of different friends whom he and John periodically visited. There were relatively few "land-use" type places which

were used over and over again like those of Frank's younger brother and sister. Out of a combined total of 19 different places from his place expedition and place preference interview, seven were friend's homes and five were stores. The lake was probably valued by him and not by his brother and sister because he was allowed to visit this place with his friend: qualitatively a very different experience from always going under the watchful eye of a parent or other adult. He also selected the lumber factory; an exciting place to cycle around and watch the heavy machinery. Like most of the boys he has a fascination with machines including vehicles, which because of the sex-role specific socialization discussed in Chapter V and Appendix A-2, girls only rarely share to the same degree. John's barn was placed third when I asked if he could order the place expedition cards in terms of preference: this barn contained a real tractor and Frank and John could play on it whenever they wished. In spite of such exciting places, he still placed "The Mountain" behind their house at the top of his list. Second in order of preference was the very large house of a friend on North Hill Road. He valued it because "it's big and it's got a really cool laundry chute, and a great big cellar." Frank also mentioned the view of the lake and the view of White Mountain as being one of the qualities which led him to select these places. His sister, Louisa, also selected two houses during the interview for their visual aesthetic qualities. By contrast, all of the places visited or identified by their younger brother, Johnny, had their value described in terms of function only.

I noted this difference in place language between younger and older children a number of times (see also Chapter VI). I cannot say how much this is a reflection of any real developmental changes in place experience and aesthetics or simply learning of adult environmental values (which so often emphasize visual qualities, and commonly, vistas) in order to repeat them to adults.

Dangerous and Scary Places

The places identified by the West Main Street children as dangerous or scary fell under the same major categories of places identified by children throughout the town and discussed in Chapter VI. Only five places were considered scary or creepy; all were abandoned or empty buildings. Three were houses. It seems that as soon as children find no one is living in a house they begin to imagine all kinds of possible ghosts and ogres. As with the more general fear of the dark the various uninhabited rooms and crannies of a house offer spaces for the imagination. The fear is rarely specific. I asked Tom why he, like all of the children in town, found the old burned house near the library scary and he explained that chairs collapse and windows break without knowing who did it. He also found the airplane hangar scary. Both of these places were outside of his allowed spatial range. They were both experienced by him while he was visiting the homes of two friends whose mothers were more liberal than his own. Checking out places like this seems to be an extremely attractive activity to the children even though they say they are very scared by them.

While describing many of the dangerous places in the town, Tom offered an interesting piece of information about his parents concern for his sister. In order to elaborate what he called the danger of "walking downtown

alone because of kidnapers maybe," he explained that his sister Louise once failed to return home after being gone from the home a few hours and his parents were very worried and thought she might have been kidnapped. She had in fact been visiting a friend on Greenlawns Hill Road and was found by one of the town policeman to be walking home. The reason for my interest in this anecdote is that one of the very few studies which includes the effects of parental fears on children's spatial range restrictions, found kidnapping and associated sexual crimes to be the major explanation of why girls' ranges were more restricted than those of boys (Newson and Newson, 1968). None of the children or the nine parents interviewed on this question mentioned the fear of kidnapping. Perhaps in a small town such as Inavale this fear is not as great as in a city like Nottingham, England, which the Newsons' studied, but is one factor which surfaces when a crisis appears.

Place-Use

Land-Use and Landscape Modification

Though their parentally defined range is relatively small, the West Main Street group of children is extremely fortunate in that the landscape within this range is almost entirely free for them to use and modify in whatever manner they choose. There are a few exceptions: Mrs. Stevenson has a few feet of soil on either side of the Stevenson family's front door for her flowers, so in the summertime the children must resist using this choice location for their earth-digging toys. In addition, the children would not be allowed to dig up large parts of the Stevenson lawn, or as they learned by experimentation, bang large nails into the tree trunks. But these are very small limitations, in contrast to such adult-dominated landscapes as Greenlawns Hill. Furthermore, the backs of these houses have no use restrictions whatsoever within the parentally defined ranges, because the parents never visit these back areas. It is this which explains the intensity of their land-use and of their modification of the landscape (Map Figures 8-14 and 8-15). In order to best present a picture of this small area as it grows through the seasons and as the children grow, I have extracted notes of each of my visits from my log records. Commentary is made in addition to these notes whenever I felt it valuable to place an observation into the context of subsequent analysis or observation.

April 11th, 6:00 PM. The past three sunny days have caused the snow to melt on a few of the southerly slopes. With no great discussion or racking of brains, the pattern of play is changing; baseball bats have appeared outside, replacing the sleds and tobaggans which had become impossible to use over the previous week as snow became slush and mud. One kid brings a ball to school and a good stick is found in the stream: "Hey, that was fun Tom. I'll bring my bat tomorrow, okay? Yeah, and John can bring his so we can all practice."

There are still some large patches of snow but some children, anxious to hurry spring along, have cleaned it off. There is a small patch of grass across from the Universal Supermarket fronting an apartment building. Each evening there is a game of wiffle ball

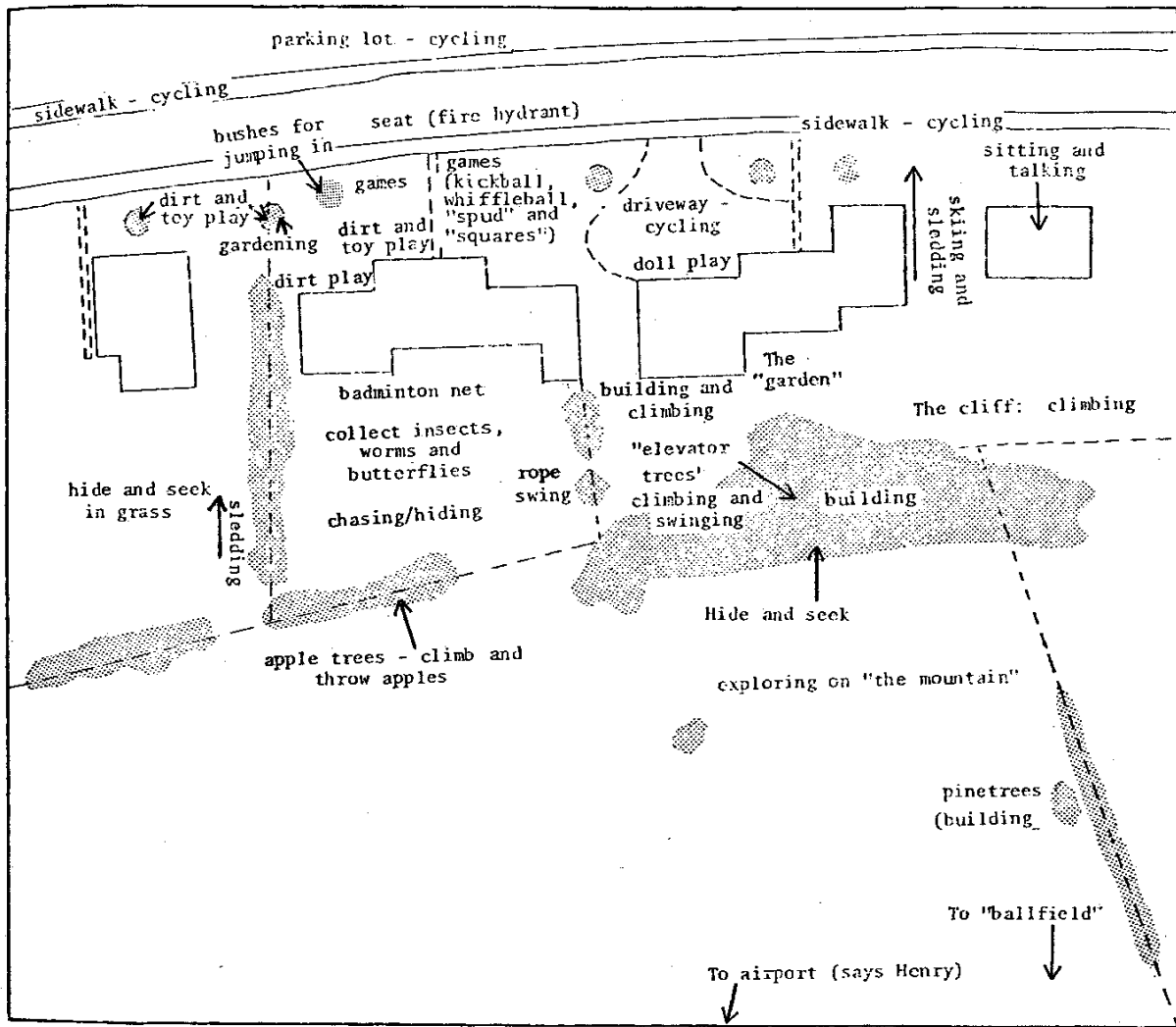


FIGURE 8-14: WEST MAIN ST. LAND-USE (including local place preferences)
 (NB: All specific landscape modifications are illustrated
 in the following Map Figure 8-15).

KEY TO FIGURE 8-15:
WEST MAIN STREET LANDSCAPE MODIFICATION

Environmental Resources Used in Landscape Modification

(This table does not include records of activities observed in the same location more than once even in those cases where building was completely destroyed before being rebuilt.)

Landscape Elements:

Trees: B1; B2; B3; B5; B12; B13; B15; B16; B17; B19; B21; B22; S1a; S1b.
Bushes: B8; B9; B12; B17; B27; B28; B33.
Long grass: B10; B20; B21; B23; B24; B25; B33.
Dirt: D1; D2; D3; D4; D5; D6; D7; D8; D9; D10; D11.
Rocks: B30; B31; B32.
Wall: B7.
Snow: SB1; SB2.

Equipment and Tools:

Branches and lumber: B1; B2; B3; B4; B5; B6; B11; B12; B13; B15; B16; B17; B18; B19; B20; B21; B22; B26; B29; B30; B31; B32.
Rope: S1a; S1b.
String: B5; B18.
Boxes: B7; B18.
Egg cartons: B18.
Hammer and nails: B1.
Clippers: B27.
Spoons and digging sticks: D2; D3; D4; D5.
Sticks and twigs: D6.
Stones: D6.
Toy vehicles: D1; D6; D7; D8.

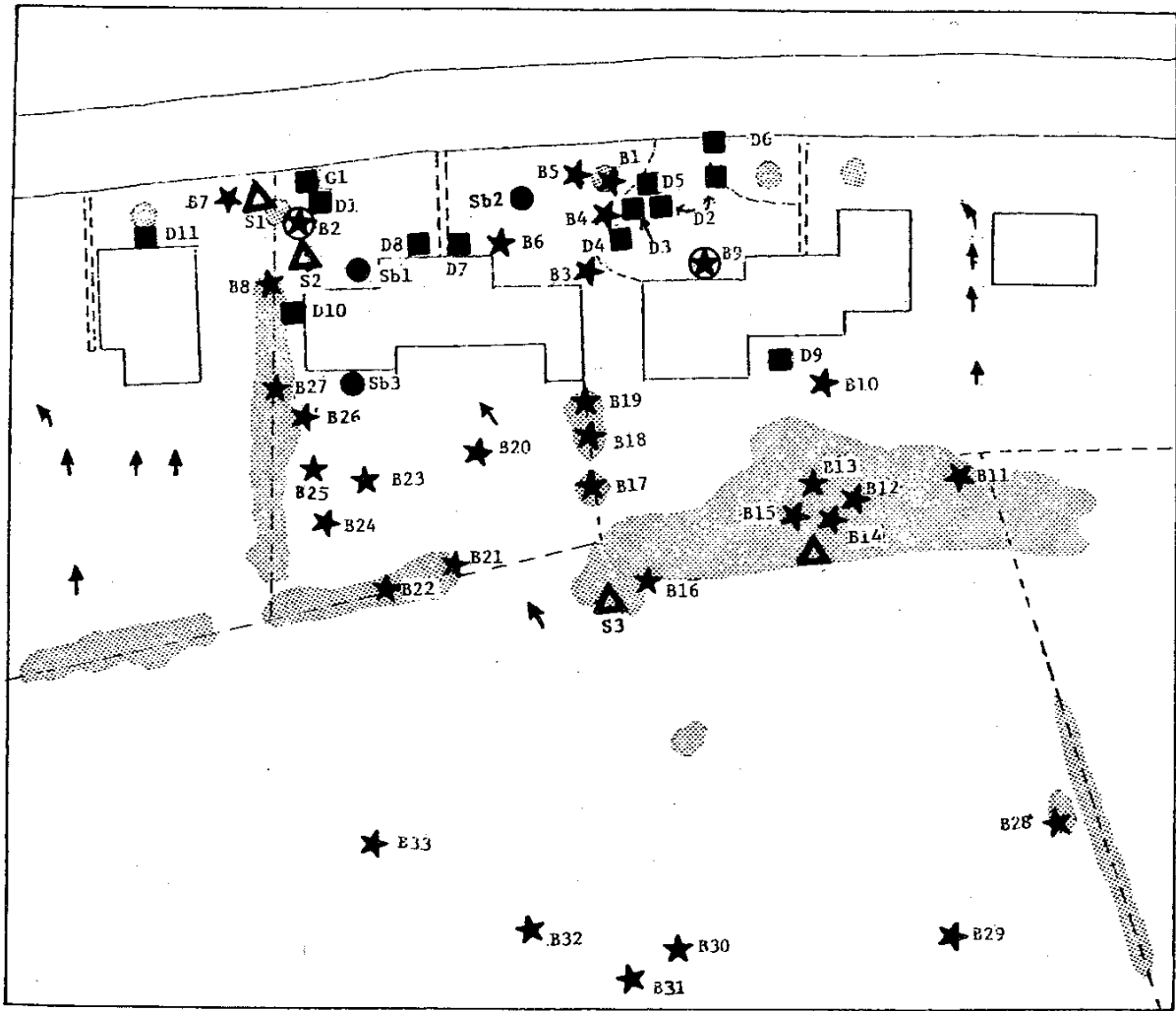


FIGURE 8-15: WEST MAIN STREET - LANDSCAPE MODIFICATION
(During one full year.)

- ★ Buildings
- Snow Buildings
- Dirt Play Places
- Snow-jump or Banked Turn
- △ Swings
- ☁ Mature Trees
- ⊙ Individual Trees

or kick ball. The central core of players is made up from the three families of children who live adjacent to this green. The formal rules have been drastically changed and are continually modified to meet such changing situations as a new car entering the parking lot next to the grass. What a location; all the families visiting the supermarket can see them. Two children from Greenlawns Hill arrive and are immediately called over; Jeff (10) the eldest is immediately given the bat by virtue of his seniority over the other boys (the two girls of similar age did not question the act.)

Because of the large number of children aged 12 years or younger in these three buildings there was almost always someone available to play with. In addition, the superb visibility of the front play area of these buildings and its proximity to the supermarket (the busiest family commercial focus and a much valued location in the children's commercial geography) meant that it could draw occasional visits from other children, making games such as wiffle ball and kick ball more feasible. This group size, combined with the almost complete freedom of land-use around the buildings, meant that the children could find and make for themselves a very rich play environment within a few hundred yards of their doorsteps; their relatively small "free range" was not a handicap

April 25th, 4:30 PM. The first sunny day with no snow on the ground. The grass is turning green on the West Main Street "Green."

All are playing on the front as usual. My first observations are of amiable play on the two trees to the westerly end of the Stevenson building. Louisa (11), Beckie (9), and friend Beatrice (11) have leaned a few boards against the maple tree and have found they can successfully climb the tree this way. They have begun to place other planks between the branches. Frank (12), Tom (8), and Johnny (7) are not doing at all well with the skinny sapling leaning against the house. It seems they are all intent on building some kind of place. The boys had hoped they could take advantage of the house for one side of their building. Seeing the girls' success, they decide to move on to better things! Frank (12) looks up ambitiously at the giant maple on the east end of the house and after a few words with Tom they begin nailing laths of wood horizontally across the trunk to serve as a ladder. They are proceeding well but Johnny and Henry (7) declare that the girls are stealing "their" wood. It is true it seems that the first planks of wood were "found" in the rear of the house by Frank but there are many more planks than could be used up in two days of building! "Let's get 'em boys!" shouts Johnny with fury. A short charge, followed by a brief skirmish brings two lengthy planks, the purpose of which I am sure is unknown to Johnny and Henry. Frank returns to hammering the ladder rails into the tree trunk. The two younger boys, hands in pockets, glance enviously at the girls' growing tree house and engage in occasional abusive criticisms of the project which are parried by Beckie:

Henry: "Our tree is thicker than yours. Our fort won't fall down."

Beckie: "Ours won't, not the way we're gonna build this thing."

In this battle of the sexes, Henry and Johnny had not counted on the comfortable cooperative relationship Tom had with all children. While Frank continues hammering, Tom takes a plank to his sister Beckie and begins climbing up.

Beckie: "You'd better go down Tom."

Tom: "Can't I come up?"

Beckie: "Do you wanna help build this thing?"

Tom: "Yeah."

Henry watches silently, his jaw low, failing to understand why Tom is different from his first grade classmates in their derogatory attitudes to girls as incompetents.

Mr. Stevenson returns home from work and puts a stop to both efforts. He says he needs the planks and that nailing the tree ladder would hurt the tree. Frank and Tom move out to the back of the house to see what can be done there. They discover the rope swing and everyone joins in, even Jane (12).

May 14th, Monday 4PM. All but the two oldest children (Jane and Frank) are playing in the dirt of the wide driveway-come-parking lot (see Map Figure 8-15, No. D-2 and Sketch Figure 8-16). Happily, I note that Enid, who has just moved into her home, is playing with the group, though peripherally. I ask what is happening. Beckie (9) explains with a wave of her arm that these are "our" houses (meaning her's and Johnny's (8)). Enid (6) says she has lots of dirt, and instructs Henry (7) to use it for their house. Enid complains that "they" (Beckie and Johnny) won't lend her a spoon to dig with. She has a plastic toy shovel for sand play that is quite ineffectual on the hard dirt of the driveway. No more spoons are to be had from the Clemen's kitchen as so many have been lost during previous highway engineering and town construction projects; the other parents know better it seems. Johnny remarks on how much bigger "our" wells are to "theirs." I am a little confused as to how Tom fits into this real estate picture so I ask whose houses are whose. Beckie immediately responds with a dividing line. Henry who had obviously thought he had been building a town with the group, looks on amazed as lines are drawn all around him. Enid seems thoroughly confused while Henry decides to challenge Beckie by staking a claim for himself. He moves toward the north of his present territory but Beckie runs to intercept while crying out, "It's ours." Henry bursts into tears. He runs to the east side of the driveway but his frantic behavior cannot prevent Beckie from making a large criss-cross pattern of boundary lines. The row continues and they turn to me with the problem. With an air of ignorance I explain that I thought that when one claims new land one has to build upon it and make good use of it before it becomes one's property. The two land-grabbers return to their building. Meanwhile, Johnny who began the ownership issue has been watching the battle with glee. In contrast, Tom did not stop his house and well building for an instant.

Happy to see Enid now playing with the other children, I ask her if she has moved in yet and thinking that I am talking about her dirt house she answers in the negative!

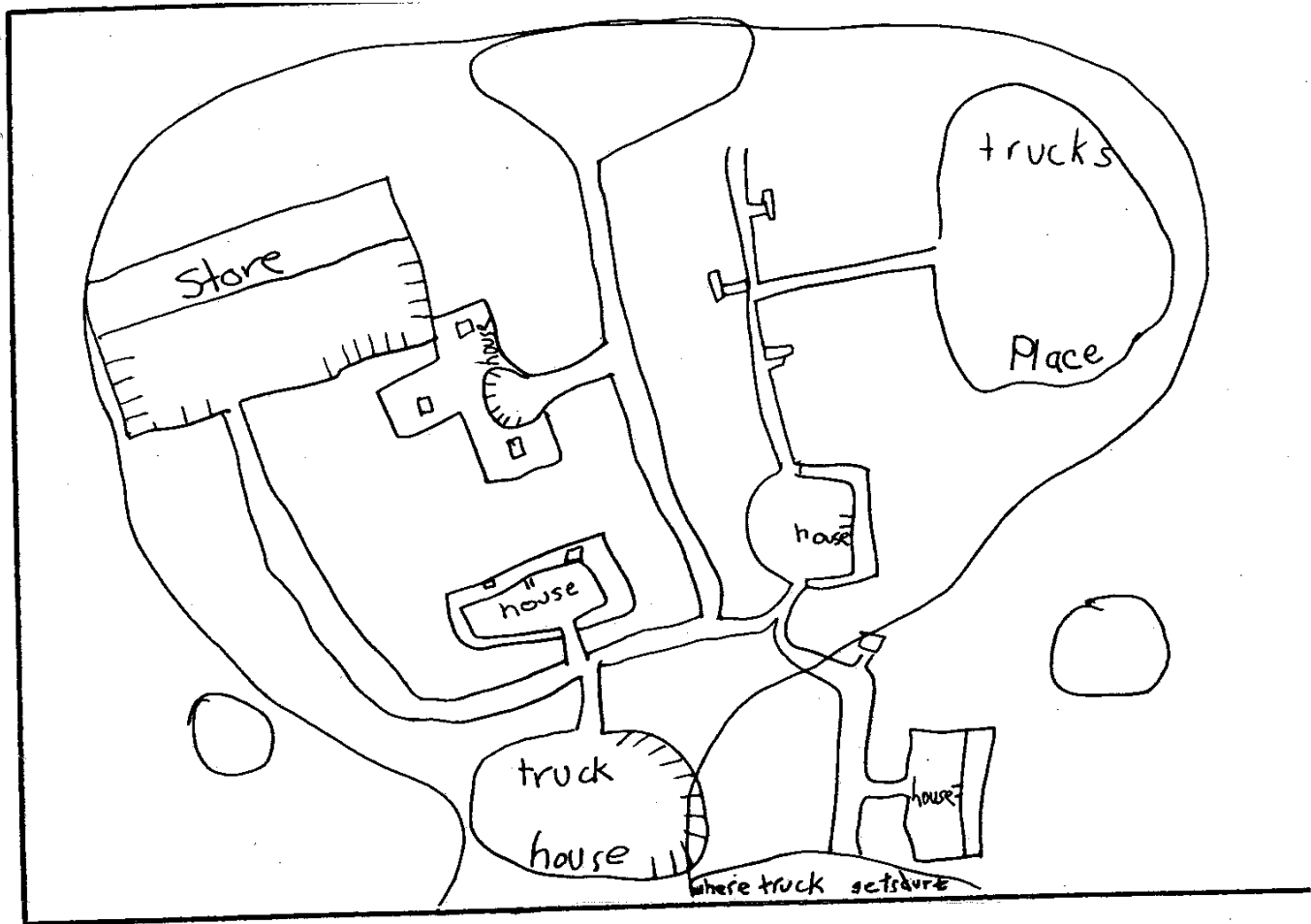


FIGURE 8-16: A TYPICAL WEST MAIN STREET DIRT TOWN (DRAWN BY BECKIE, 9)

Place ownership was frequently used, especially by Beckie, as a means of stating or consolidating new friendships by excluding others. Throughout the town, the sharing of places or tools and toys was the major means children used to express their interest in including or excluding another child in their activities.

Friday, May 19th, 4PM. Beckie and Louisa are building a house behind Louisa's house. When they showed me the place, I volunteered a suggestion about the shelves they had made. It was flatly rejected with the kind of adults-think-they-know-best air which I fully deserved: "We just want a little place, just for us."

Much greater interest was shown by Louisa and Beckie than the boys in making places to be used--"just for us." This difference was very common throughout the town. The boys' interest was more often in the process of building structures whereas girls seemed much more interested in making meaningful places that were home-like, a quality reflected in the great detail they put into places and in their naming of houses, rooms and paths, etc. This log entry referred to a house built in long grass which had no walls but had seats and numerous shelves, with bottles and cans.

Wednesday, May 23rd, 4PM. Beckie, Tom, Johnny and Henry are playing in the dirt of the driveway again, this time a little to the north, to take advantage of the shade of the maple tree. Casey (10) has joined them but he is bored. He and Tom saw me at the post office and hailed me over. Casey moans that there is nothing to do and by casually tossing his baseball in and out of his newly gloved hand, announces his new possession. He is obviously spoiling for a game but there is no chance that these children will be allowed to go to the town ballfield. Henry, with a boundary around his property is busily working on his house with a wall, stream, and the inevitable dirt pile. Meanwhile Beckie and Johnny are building a detailed garden within their boundary line. Beckie is deeply involved in their project while Johnny seems more interested in gloating over its superiority to Henry's development. Tom is quietly working on his own house.

Casey, whose home is on West Main Street at the edge of town rarely spends time with his classmates, most of whom live within the town. The prime reason I believe is income. Casey is from an extremely poor family and his mother cannot afford to buy him items such as baseball equipment, fishing rod, skis, or a bicycle. This prevents him from joining in many activities with a large proportion of his classmates who are from well-off families. This effect is especially clear at wintertime when skiing equipment works in a powerful way to separate the children along income lines. Furthermore, the tendency toward income segregation seems to be directly developed by the parents who encourage their children to play with families of a similar or better income bracket. I believe this is because driving children to and from a friend's home is a common means by which the non-working wealthier mothers find an excuse to socialize with their own network of friends. A further factor in this income segregation in the social network is the inability to reciprocate with child-caretaking, overnight stays, and parties. It is possible that there is an additional locational factor in Casey's situation. He is relatively far re-

Louisa was typical of children of her age. Girls of this age especially seemed to be still very interested in such play as was exemplified by Annie and Jo of the Robinson family (below). The presence of younger children seemed to enable them to feel more comfortable in play which they seemed to sense would otherwise be considered "childish." Louisa was the same with house building in bushes; she would commonly claim disinterest in "houses" of which she had been the chief inspiration, and in which she had herself spent much time playing. I noted this less often with sixth and seventh grade level boys or older age. But there were exceptions. Casey for example, who as I noted above spent more time alone or with younger children than did many of his peers, and used the "truck garage" next to his door stoop more than any other single place during sixth grade. Even during the seventh grade, I sometimes found him in the dirt at the front of the Stevenson's building highways and homes, though like Louisa, he would commonly deny it or express how boring it was. It may well have been relatively boring to him and he would have preferred to have been playing baseball, but we cannot discount the possibility that societal attitude to imaginative play amongst youth results in a rather sudden and "unnatural" erosion of this activity.

This denial of interest in imaginative construction of places by Louisa and Fred (10), a visiting friend, time 13th, 6PM Henry, Johnny and Fred (10), a visiting friend, are again building in dirt, this time in an area of the lawn next to the door stoop which has become worn down since the spring through heavy use by the children who commonly hang around there when alone and not playing. End is keenly observing this activity. I was unable to accurately record the activity as it is almost two weeks since I visited the group and my arrival resulted in the total abandonment of the play place to greet me. In response to my familiar greeting--"What's happening?"--they independently show off their racetracks to me. "What are the roof slates stuck into the ground for?" I ask. "Houses," proclaims Fred briskly with a "how-could-you-be-so-stupid" air. A couple of minutes pass by and I might as well have not been there as they become involved in a car race and I sit back against the house to complete this log. It is impressive how each of the three private racetracks join on to a common circuit. It is very usual for this kind of group dirt play to begin with independent projects and to result in some cooperative project. It almost always begins with each child making their own house or

May 25th, Sunday 4PM Louisa and Beckie have built a beautiful dirt house. Louisa claims Beckie did it all and she just decorated it by planting the dandelions around it. As I approached she had been as intently putting down dirt as Beckie was (I think that this denial is the kind of pretense common among girls of this age; that they are too old to be interested in such play). Meanwhile, Tom and Johnny and Henry had built their own very fine castle.

However, his free range within town is unlimited and he makes great daily use of his small bicycle. Furthermore, a number of his classmates live a few miles out of town but interact more with their peers of similar income in town than does Casey thanks to their "chauffeur mothers."

or castle, etc. Cooperation commonly begins with the common need for obtaining resources--usually housebuilding material dug out from a good area of loose dirt that is labelled the "sandbank", the "town sand pile" or the "quarry", etc. Common sections of road are then built in order to cart the dirt to their homes and before too long the children think of other services that are better shared such as the supermarket, the laundry and the dump, and their originally undirected building activity begins to take the form of a town and is proudly called such by the children.

Play with dirt or sand and water was more commonly cooperative and harmonious than play with other landscape elements, toys, play equipment, or organized games. No wonder such excellent observers of child development as Froebel recommended long ago the importance of providing sand and water for young children (Froebel, Pedagogics of the Kindergarten, 1898).

June 19th I found Casey (10) sitting on his stoop stripping a green branch two weeks ago. He had a very heavy pulley he had found in their old garage and some wire to make a hook. I thoroughly admired his attempt but it was doomed to fail given the unsuitability of his resources. I discovered how keen he and Tom were to fish and decided to drop my approach of not getting materially involved. With little effort I found two used rods in the township and gave them to the two amazed boys. The following morning Casey went out shortly after dawn and caught a seven inch trout in the West Brook a few yards from his home. Tom however was told that he had to be taken by an adult if he was to fish. He planned with Casey to get together on Wednesday afternoon when there was a half-day off from school. They had planned to invite me via telephone but when they found me not in, they decided to go ahead. Tom fell in West Brook. His mother was furious and had told him to hand over the rod as punishment. She said she had since cooled down a lot but could not go back on her word.

A more common punishment for the breaking of range or activity restrictions was to "ground" the children, that is to prevent them from going outside at all. This restriction to the home would be frequently made for a longer period than either child or parent could bear. This leaves the parent, usually the mother, with the dilemma of having to reduce the "sentence" without seeming to "go back on her word." A common way of dealing with this was to make a simple trade-off with the child such as reducing the sentence through the execution of a simple chore or errand.

June 26th, Monday, noon Louisa, Johnny, Henry and Enid, unable to say what was happening as their play stopped on my arrival, but I noted that Henry and Enid were playing in a new "house" (Map Figure 8-15, No. B1 and Sketch Figure 8-17). As usual they are keen to show me their new construction. It is made from the limbs of the maple tree that have been cut by the power company in order to safeguard their transmission lines. Where these limbs fell and were rudely piled together next to the sidewalk, that is where the house was built! The structure is simple: a few limbs have been pulled out from one side (the side facing inward, away from the road).

FIGURE 8-17: A WEST MAIN STREET "TREE HOUSE"
(sketch rendered by Gwen Hamlin from photograph by the author)



Small branches and twigs full of leaves have been gathered together to complete the cover of this dark cave-like house. Louisa begins to enter but Henry shouts, "Get out, it's ours." Louisa reminds him it's on her family's property (Henry's family rents the apartment from them). Having already learned a powerful lesson on place property and ownership through a dirt play last month (see above) it is probably not surprising that Henry doesn't challenge this argument.

The speed with which this new resource was taken up and used for building is yet further demonstration of the importance of this activity to the children. They could of course have found equally suitable loose parts for building at any time in the rear of the house but while the site qualities are excellent there, the location does not seem as suitable for two reasons. First, much of the children's play is squeezed into brief periods between meals, television shows, school, or shopping trips and it must occur very close to the home so that they may be easily called in. Secondly, children commonly begin playing alone or in pairs and often rely upon their presence to attract friends to join them. They may for example be indoors eating dinner and will run out just as soon as they can. For this reason, the front is again superior to the back. This is not true of all homes of course--on suburban-like areas such as Greenlawns Hill for example, the family orientation is more to the lawns in the rear of the homes. Even then the children will frequently select a spot for their play from which they can be seen by a maximum number of potential playmates.

June 27th, 11AM Beckie and Enid are again building a house from the cut limbs of the maple tree. Tom, Henry, and Johnny appear from different directions as I drive up. Frank (11) is, as usual, cycling around town with his classmate John Hawkins, and Louisa (10) is cycling back and forth along the sidewalk between her home and the post office on her classmate Veronica's bike. Before I could ask what they all had been doing, Beckie and Enid were dragging me out of my car. They led me a few yards from the driveway to a tunnel leading into the large pile of cut limbs and branches from the maple tree (Map Figure 8-15, No. B1, Sketch Figure 8-17) which had been considerably elaborated since Henry and Enid had shown me yesterday. We crawled through the tunnel into the oval inner chamber. Enid declared it was her house; cries of complaint followed from Beckie but Enid quickly clarified by explaining that Beckie helped her build it and then had given it to her. This was enough, for all Beckie required was recognition of her building competence. Henry asked me when we would be going up the mountain together. I discovered that "the mountain" was the name given the hill behind their homes. Henry had remembered that many weeks ago when they were telling me about these wells, I had expressed an interest in seeing them. We travelled first through the wall of trees via a bush house which everyone credited to Louisa (Map Figure 8-15, No. B3). This house had been much modified over the past few weeks. In addition to clarifying the walls, ceiling and floor, by cutting branches and sweeping, a wooden fruit box had been tied to the branches to make shelves and a styrofoam egg crate hung from the wall as a telephone no doubt. Following the line of bushes and trees for a few yards more, they

showed me the first 18 inches of an ambitious house being built by Frank (11) and John Hawkins (11) out of solid lumber that had been left behind the house by previous owners. The journey continued through long grass to the neighbor's garden which they were all proud to have helped with. We struggled up the steep 10 foot escarpment to a dense stand of sapling birches. These wonderful "elevator" trees had white painted bands around them which Tom and Beckie explained were the floor levels for the elevators. Tom shinned up a 5" diameter tree to a height of 5 feet with an alacrity which turned Robert Frost's "Birches" into more than a beautiful metaphor for me. The tree bent a full three feet enabling him to leap monkey style (he had no shoes) to a neighboring sapling. An elegant return to the ground was simply achieved by climbing to a suitable height while holding with one hand onto a neighboring tree, and then swinging down while holding with two hands onto the graciously bending "elevator." The white bands around the trees were supposed to inform one of the best "floor level" to take in order to guarantee a safe return. The technology was not perfect because of the different weights of the children, and no doubt because the trees were growing, but the trees offered great enjoyment for those daring to experiment.

June 30th, Wednesday 11AM Johnny and Tom playing in the new "house." This seems to be holding more sustained interest than the other building projects around the house. Why? Perhaps because it is next to the sidewalk, in full view of any passers by. Or perhaps because the material (cut maple limbs) produces such a stable structure with so little work.

September 1st Beckie, Tom and Jane returned from their vacation 10 days ago but I have not been able to visit as I have been busily working with other children on the "place expeditions" before the new school year begins. The fourth place on Beckie's place expedition was a tree house built since she returned (Map Figure 8-15, No. B13). I asked her the difference between a tree fort and a tree house, having noticed that boys speak of their places as "forts" more than do girls. She explained that a tree fort is up in a tree whereas tree houses are just made with trees. As we approached the area of the tree house, in the woods behind the house she expressed great concern that it might have been "wrecked" by the three 6th grade boys who were up in this area yesterday. The reason for her concern comes from the half-eaten corn cobs which are scattered about the wooded bank. She figures that these boys must have raided the neighbor's garden. The tree house of the moment is not severely damaged but more corn cobs in her "kitchen" leads to a lowered voice as she elaborates through tight lips, the criminal character of the 11-year old boys. The tree house was made with Tom, Johnny, and Henry. She points to a pile of sticks and explains that the four of them had also built a tepee but that Louisa had wrecked it. "Why?" I ask. "Because she had put a couple of sticks on it but I said she couldn't come in it. So when we weren't there, she came in and wrecked it." There are no enclosed walls to the place:

"This is the kitchen (floor made of roof slates found in the rear of their houses), these are the beds (wooden planks perpendicular to the slope, resting on three house bricks at the lower end to end to make them horizontal) and the trees are the walls (the "elevator" birches, bent over from being swung on by Beckie and Tom). We never got to put this in our diaries, but we come up here from time to time and clean-up."

September 3rd The Collins family moved in yesterday, next door to the Stevenson family. The children already knew each other a little from hanging around the previous few days while the foundation was being moved, but it seems that the eldest boy, Clark (9) had been in rather a hurry to find some good places for his activities. According to Frank, Clark had laid claim to "Fort Treeconderoga" because the trunk of the maple tree in which it sat lay on his family's property. This fort, which has been dramatically elaborated over the past two weeks, largely by Frank, even carries a large multi-colored sign. Instead of a raging battle, as I heard Frank threaten, an easy settlement was made by simply allowing Clark to play in the fort. Such a direct participation in the group would probably not have been negotiated so quickly without this pull of property ownership. Among these children, I noted that reference to adult-defined property ownership as opposed to child-defined ownership of child-built places, child-found objects, and toys, etc., was always used in a serious argument. Its use carried a very high rate of success in these verbal battles. Similarly, it struck me as unusual yesterday that Beckie should have considered the raid upon her neighbors garden as so much more serious than the abuse of her "house" by the same boys. Clearly in the children's minds adult property and ownership is not only more sharply defined, but more sacrosanct than that of children.

September 12th, 7PM Beckie shows me her new tree house (Map Figure 8-15, No. B4), she laid out by herself in a half hour period last night. Johnny joined her today by helping to add leaves to the top of the wooden roof. And now, this evening, there is a beautiful house with an internal wall made of bricks and Enid and Henry are helping. The roof is now covered-in, entirely with planks, branches, and leaves. A cardboard box serves as a window, and a space as a door. The basic structure is formed by a couple of the tree limbs that were cut by the phone company in June.

October 10th Beckie found a very large cardboard box across the road last week. It must have contained something like a refrigerator. Since that time I have seen it in three different locations and it has been much modified. It has throughout this time provided the center of fun for all members of the group of Beckie's age or younger. Beckie has throughout been the leader and initiator. In marked contrast, Tom never brings the children together to organize games or building. Furthermore he never complains about

dominance by others in any of the activities. However, he is innovative and quietly designed an excellent "trap door" for this portable house by tying a piece of string to a flap on the front and leading it through a hole in the top so that it can be operated from the rear (Sketch Figure 8-18).

October 10th The Collins family seems to have been well assimilated into the group. Clark and Beckie in particular are great friends, though they barely exchange a word at school of course. Instead of Clark's threatened border clashes along the Stevenson/Collins line, a house has been built which straddles the dividing wall in a most impressive attempt at neighborly collaboration (Map Figure 8-15, No. B7).

I have noted that in order for any child to play in front of any other child's home in the group, the guest child must at least have been playing with the host child for some time during that day. Otherwise, it seems that the children are conscious of invading the parentally-defined home territories. This distinction is most clear on the Stevenson/Collins border because they have the only property line with a wall or fence. I believe the building of the house across this border line is a direct expression of the children's awareness of the sharpness of this wall and how it works as something of a barrier to the easy flow of play across this property line. It is notable that the property lines in the rear of the house are much more loosely recognized.

The relative freedom of children to roam through territories is one of the things which ought to have been discovered by some of the countless studies on children's land-use by planners and their research teams. It has not. We know almost nothing about how different housing layouts result in perceptions by the child-residents of what areas are private, semi-private or public and available to them. This is the kind of information planners must have if they are at all serious about replacing the present narrow specific playground approach to children, with one which recognizes that children "find" play environments themselves wherever they are.

October 30th I asked Clark while at school today, how he felt about having moved to his new house on West Main Street for I knew that he had not wanted to leave all of his friends on School Street and North Hill Road. It seems that he now perceived the new home as an improvement: "At first I wasn't happy but we've got more property now and we've got three sheds to play in. We can play hide and seek in the tall grass, and the hills are this steep (makes an angle of 70° with his hand)." I ask him if he misses anything that he had at his previous home. He thought of two things: his rug and his two sandboxes. He complained sorely about the sandbox situation: "We don't have one yet except a tiny one in the attic; it's only big enough for three little dune buggies."

January 2nd, Sunday Beckie and Tom got bored with sitting around

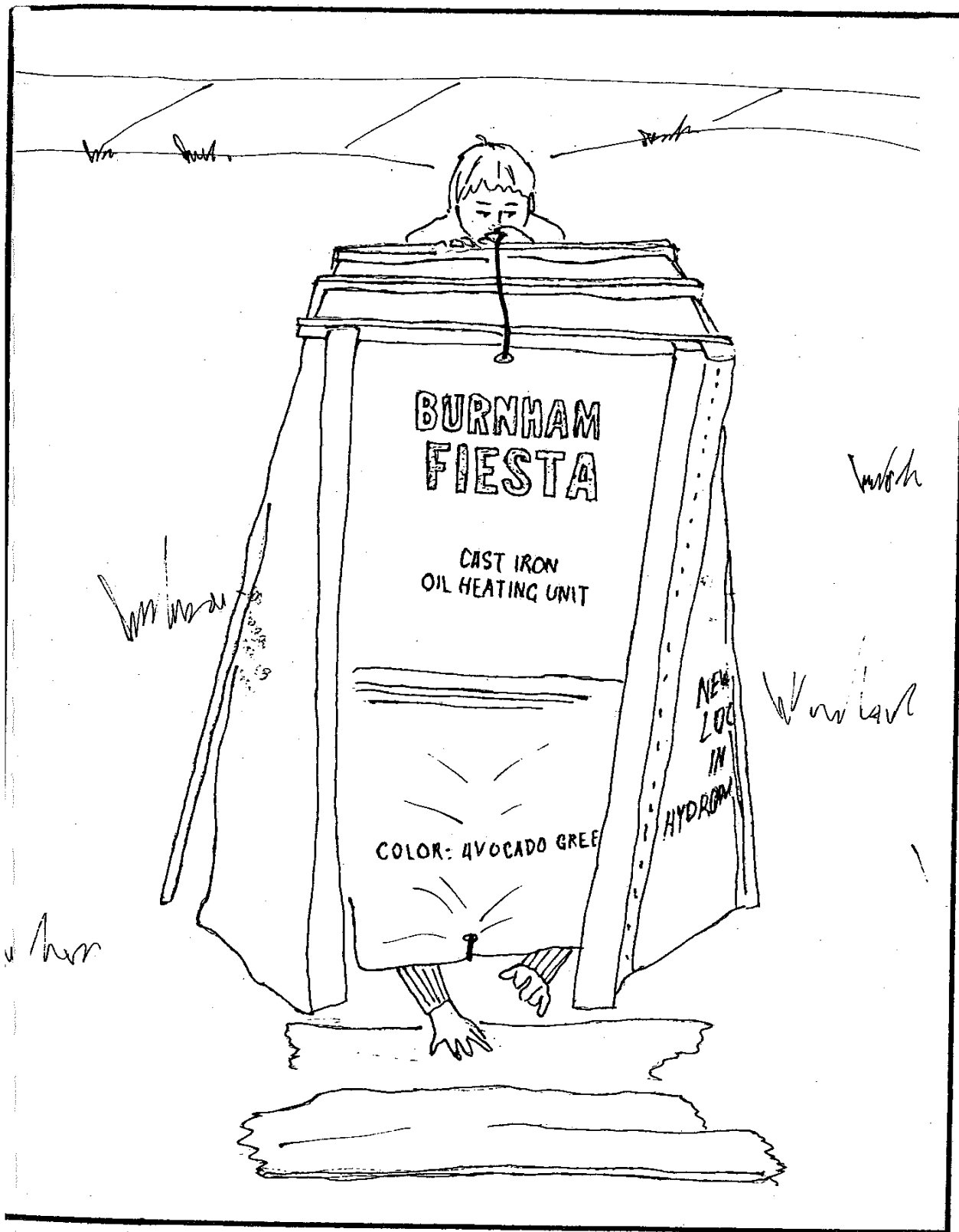


FIGURE 8-18: WEST MAIN STREET - PORTABLE HOUSE WITH "TRAP DOOR"

watching T.V., playing with Beckie's new spinning competition game. Her other birthday presents of two days ago have also lost their appeal. It's grey and lightly snowing outside, but they decide to go out and play "King of the Castle." There is always so little fuss in these decisions. "Let's go outside," says one, usually Beckie. "O.K.," says the other! The immediate accessibility of safe outdoor space makes this possible. If this decision were dependent upon a parent each time, as it no doubt often is in city high-rise developments, it would be extremely frustrating to these children and perhaps a debilitating factor in the development of their independence.

January 6th, Saturday evening Met Beckie at her door. Such shock at seeing me for I have been gone for two whole weeks of discussions in Worcester, New York, and Chicago. She takes me by the hand and pulls me across to Henry's house shouting, "You've gotta' see this." It's twilight, but what a beautiful sight: a 10-foot by 6-foot snow fort that is about 5 feet high.

Because of my trips away from the town I learned that I had developed a relationship with the children of the sub-sample families which was qualitatively different from that usually found between adults and children. I also learned that any trips away from town lasting more than a couple of days threatened this relationship. On my return from occasional week-long trips I was surprised to discover the relative coolness and formality of the children's attitude toward me. Instead of continuing with their play and chatting away to me or grabbing me by the hand and pulling me to some new discovery, they greeted me in the smiling but disinterested manner to which adults become accustomed from children. It demanded considerable effort on occasions to remind them that I was interested in them, that I missed them, that I cared. I would commonly then be plied with questions as to why I had left for so long even though I tried on each occasion to explain this before leaving. Gradually they would remember and I would be drawn into their lives again.

March 8th, Saturday Early spring! Returning from a week lecturing in Canada I find dramatic changes in weather and in the associated play. The snow has almost gone from the southerly slopes such as the fields behind the West Main Street group. It seems that "two or three days ago building began again with great vigor." Tom tells me that he, Beckie, Clark and Mike built a house for Mike in the woods behind the Clemen's (Map Figure 8-15, No. B12). They have also started work on a "laboratory." This idea follows the new laboratory in school which is very small, popular room packed with interesting experiments. A fence from the last year's garden of the previous tenant neighbor provided the perfect resource. Because none of the landlords or adult tenants use or develop the back areas of their dwellings the children treat all resources as freely usable. "Mike's house" is a precarious lean-to structure built on the slope. Vertical fence posts are banged in with a most unwieldy gigantic stone and other posts are leaned against it. Why do they build on a slope when they could build so much more easily a little lower down on the flat land? I think one reason is

that they periodically take criticism for building on the front areas of the homes. This back-wooded area affords some unhindered opportunities while still lying within calling distance. More important though I believe are the suitability of resources. The numerous birch saplings bend so readily to form walls and are most convenient for attaching other pieces of wood to.

From the stories I have been hearing at school, all of the group had been playing out back a lot. Johnny had found a deer's head in very good condition (it was believed that dogs had chased it and eaten the carcass). It had been carried about to many places but now Beckie has carried it and placed it on top of the newly built "lab."

Henry looked up at the steep slope where we stood, uncertain of his ability to climb it. Last fall he had tried to climb it a number of times and had really become scared of it. He had grumbled throughout the summer whenever Beckie and Tom had gone up this slope for it meant that Johnny, Clark, and Henry would follow and that only Enid would be left for him to play with. Another factor I believe was his relationship with his mother. He was now allowed to play out behind his house with permission and with one of the older children. Previously all of his activities had been within easy checking distance of his mother to whom he had frequently turned in tears. Now he is facing a task that had been defined for him by older children and his mother was not there to support him. He very much wants to be with the group and so with gritted teeth he reaches for the roots and saplings and begins to drag himself up the bank. He arrives and Beckie passes him the deer head. As the group set off to walk horizontally across the wooded bank Beckie laughingly chides Henry---how he will fall because she had left him carrying the deer head. His face reveals considerable anxiety but he sticks with it, no doubt to prove Beckie wrong.

March 21st, blustery and grey. Driving by on my town land-use survey I note that Beckie is helping Johnny set up the yellow plastic "tent" he got for his birthday last spring. Johnny has been feeling a little out of things because he had no house or fort. Beckie and Tom complain that someone "wrecked" their "lab" again last night. They say they had finished the roof and walls and successfully hung the deer's head on the roof. These "wreckings" are a mystery which in large part the children like to create with their imagination.

Meanwhile, Tom has joined Clark and Mike on their front lawn. They have found a bare patch of ground beneath the tree and have begun making highways. This is the first time they have used the Collin's front lawn for any activity. I believe the toboggan runs which ran from the back of their house to the front "broke the ice" for the group to use this land more. During the winter with thick snow on the ground, adults seem much looser about children's recognition of property lines in their play. This is probably another stage in the gradual assimilation of this new family into the group. Perhaps the peak activity point will move from the Clemens/Stevenson driveway towards the west now.

The peak center of activity did move toward the west during the following and subsequent years. The driveway in the east had been stoned over and the easternmost maple tree affording shade and bare patch of dirt had been chopped down. The most favored places for dirt play now became the area between the Stevenson and Collins homes and beneath the extremely large maple tree in front of the Collins home. This dirt area gradually grew. The parents initially made attempts to protect the lawn by restricting the children's activities but they came to accept the inevitability of the location for their children's play and by the end of the following summer, grass remained only in the corners of the lawn. A further factor effecting this westward migration of activities was the changing interests of the easterly residents, Beckie and Tom, in the following summer. Both of them joined the Little League and began visiting friends outside of this group of five homes. They still spent much time in dirt play and building but they were no longer the leaders in this activity. For Mike (6) and Clark (10) dirt play was their major activity and the dirt area beneath their tree became the play focus for the three buildings when two new children, Joe (10) and Ruth (9) moved into Henry's house when he moved the following year.

With one small exception, all dirt-building activity takes place in the fronts of the houses. I can identify three reasons. First, the children select relatively hard areas of dirt because they begin by scraping roads out of the dirt. It is for this reason that the driveway is so highly valued. Secondly, dirt play is an activity which the children frequently engage in alone, and being in the front of the houses maximizes their chances of being seen. The third reason is that much of the dirt-building is done by Henry and Enid, and during the larger period of these observations they were only allowed in the backs of the houses "with permission."

March 25th, PM, very sunny, warm. Clark, Johnny, Henry and Mike are playing next to Johnny's yellow "tent" which is still attached to the large elm tree (Map Figure 8-15, No. B5). They are having a "pretend cookout" with two coffee cans over a pile of stones and wood. One is filled with "stew" (mud). The reason--Clark and Johnny are going to the Cub Scouts this evening. Johnny is already dressed for the event!

April 3rd, grey. Rainy for past two days so no outdoor play. Clark has tied Maxwell House coffee can tins to his maple tree to serve as sap buckets. A number of town children have tried "sugaring" this year who have not done it before. It has become a small fad in town which is localized mainly to these and the other four West Main Street families.

April 25th, 3PM-7:30 PM The Stevenson/Collins border tree is again being developed as a tree fort: this time with earnest. I found Clark, Johnny, Henry and Mike working on it at 3PM. A little later (6:30PM) the three Clemens children came out to work on it.

From 6:30 to 7PM everyone played a game of tag on the Stevenson front lawn except Jane. Jane went indoors to tell her mother she would be cycling in the car park across the road. This had not been possible until last Saturday when the spring time change

had meant that it was now light enough for them to cycle in the parking lot after the store was closed in the evenings. It took only seconds for Frank, Beckie, Tom and Johnny to observe Jane cycling before they raced off to join her. There are not bikes for everyone. Louisa and her friend Beatrice decide to work on the now impressive tree fort. Henry has had to go inside, leaving Mike all alone on the lawn. He shouts across to Beckie to come and play but meekly for he knows it is hopeless. It is like a circus in the parking lot with Beckie having a wonderful time putting her feet on top of the handlebars and trying out all the old tricks for the first time of the year. A new fad has been re-born. And so Mike satisfies himself by climbing the fire hydrant and looking across at the "circus" with envy.

It was difficult for me to determine the dynamics behind the often dramatic genesis, diffusion, and decay of fads in the town. Some of them were obviously seasonal such as snow-building after the first snowfall, or traditional such as building pumpkin faces and minor mischievousness on Halloween night. Most others were dependent upon certain weather conditions, but by no means automatically occurred, such as kite-flying or bicycle stunt riding. Still others were seemingly environmentally independent such as yo-yo playing. Whether an individual child's new or re-discovered idea diffused broadly to the other children or not did not seem to be primarily related whether or not they were popular or more socially interactive children. Rather, it seemed to spring from the current pattern of town and school activities in combination with the weather: after one relatively quiet period, a day early one spring week, for example, a child brought a baseball bat into school and baseball developed in two days into the near fever pitch which traditionally occurred over a month hence.

May 6th. Johnny is really upset. He arrived at his home from school 15 minutes before me and now with his eyes tearing he is sitting on the three foot stump of what had been a very old elm tree when he left for school. With little control in his voice he shouts, "That was our tree, we used to play under it all the time--it's not fair, we didn't even know they were going to do it." His tent had even been tied to it when they came to chop it down. I suggested we count the number of annual rings on the tree. He and Clark did so and discovered it had precisely one hundred. They seemed to feel much better about it having lived so very long and Clark told Johnny that maybe it would have died soon anyway. He had played under this tree very little and had not developed the same feelings for it as Johnny had.

There has been no play on the driveway since last fall when the stones were laid down in order to improve the parking lot during the few days of the spring "mud season." Last summer almost half of the activity of the children other than Frank, Jane and Louisa was in this dirt driveway. Not only had it been central for all of the children's homes but the dirt was said by the children to be excellent for building with. I am certain that children's use of this area never entered the landlord's mind.

These two log entries illustrate an adult ignorance of what places and equipment are important to children. This is common even amongst parents with regard to their own children. Such ignorance is born, I believe, simply of a failure to recognize that there is anything to be gained from observing one's children or reflecting on one's own childhood. Instead, the parents seem to base their play area and equipment decisions upon norms of what the child is ready for as demonstrated by neighbors or as dictated by television advertising. It is because of this that the parents of Greenlawns Hill did not consider that by culverting the tiny brook on their hill they were removing the younger children's "most favorite" place, one of the very few remaining non-manicured spots on the hill. Fortunately some parents such as the Robinsons are very much aware of this issue. In explaining their liberal attitude towards their children being able to choose and make their own places and get dirty they simply say they remember how important these things were to their own childhood. Other parents seem to bury such memories beneath their overriding concern to bring up clean children who can perform with, or successfully operate, a series of toys and equipment which our technological society throws before them in more and more sophisticated mechanical forms; forms which demand nothing from the child beyond the ability to learn to use them for the purpose they were built. In all of this, these parents believe they are providing the best possible environment for their children. In fact they are telling their children that they should always look outside themselves, to others, to find out what it is they want next. They are being educated to believe that they cannot themselves create anything worthwhile except via successful performance along the manufactured toy and equipment route that so much resembles the step-like process of most public school education.

May 10th, very sunny 4PM. Only Henry is outside. The boards are all down from the tree fort. The girls have wrecked it he says because he saw them throwing the boards down. He obviously thinks the girls have no share in this enterprise so I ask whose fort it is. "Frank's, and Clark's and mine--all of us boys. But they have to wreck it." In spite of much cooperative building, Henry (now eight years old), like Johnny last year, is very caught up in the sex-segregated idea of play.

May 23rd, Wednesday 6PM. Beckie and Tom took me into the woods behind their house as they wanted to find something to photograph. Beckie said they had built a new house but on arrival declared, "They've wrecked it." "Who has wrecked it?" I ask. "Well, it's fallen down." "But you said someone wrecked it," I remind her. "Well, probably Clark did." I don't understand why Beckie, Johnny and Henry have this excessively possessive attitude to these places and why they are so ready to apportion blame to other children. It is difficult to know whether it has been wrecked. Did she wish to impress me that this, her house, was so much better than it now appeared or is this an example of the enjoyment children seem to find in creating mysteries about unknown wrecks?

In all such instances of wrecked tree houses and forts the children are rarely upset for more than a few minutes. This is a clear illustration that in such building practice the finished product is not the prime purpose for the

the activity. Clearly the most important aspect of all building and landscape modification is the satisfaction children find in the process of transforming the physical world.

CHAPTER IX. The Plum Hill Family

Emily - 6 months (1)
Danny - 1 year, 4 months
Davy - 6 years, 11 months
Annie - 9 years, 8 months
Jo - 11 years, 6 months

The Robinson family home is located on the outskirts of the town, one quarter of a mile up Plum Hill from the crossroads (Map Figure 3-6). The moderate-sized two-story home is situated on the roadside, surrounded by fields on the three remaining sides (Map Figure 9-1). Up the hill, to the southeast, lies an open mowing (2). Behind the kitchen garden, to the south, is a small brook banked with bushes. Beyond this lies a rough abandoned field with tall grass and scrub which extends southward for 500 yards where it meets abruptly the edge of a thick coniferous wood. Immediately past the ditch, on the western boundary of the house, is the home of an elderly couple and, beyond that, down the hill, a series of other residences, largely permanent but a few of them temporary vacation homes. Across the road, to the south is a hill leading to the town reservoir.

Mr. and Mrs. Robinson had both come to live in the town from New York, nine years previously, when the eldest child was two years old. Mr. Robinson is a master "jack-of-all-trades" serviceman. He works each day away from the home, but also operates a workshop in the rear of his house as a free-lance repairer of boats, lawnmowers, skidoos, cars, etc., depending on the season. Mrs. Robinson finds herself with the full-time job of caring for five children and housekeeping.

All five of the children are in good health. The three eldest, two girls and a boy, attended the elementary school throughout my two-year stay in the town. The other two children were too young to participate in much of the initial fieldwork, but were observed in their activities on all of my visits to the home. Toward the end of my stay, they were able and willing to talk with me. These two children, now five and six years old, have been observed informally over the past two years during visits made at intervals of approximately three months. My relationship with this family grew throughout the two years of my residence and continues to grow as the five children share with me their interest and joy in exploring, playing in, learning about and transforming the landscape.

1. Ages as of June 1, 1972.

2. "Mowing" is a local term for meadows which are used for hay.



PLATE XVII

Plum Hill and the town center built in sand as part of a "free landscaping" exercise carried out by Davy in his ninth year.

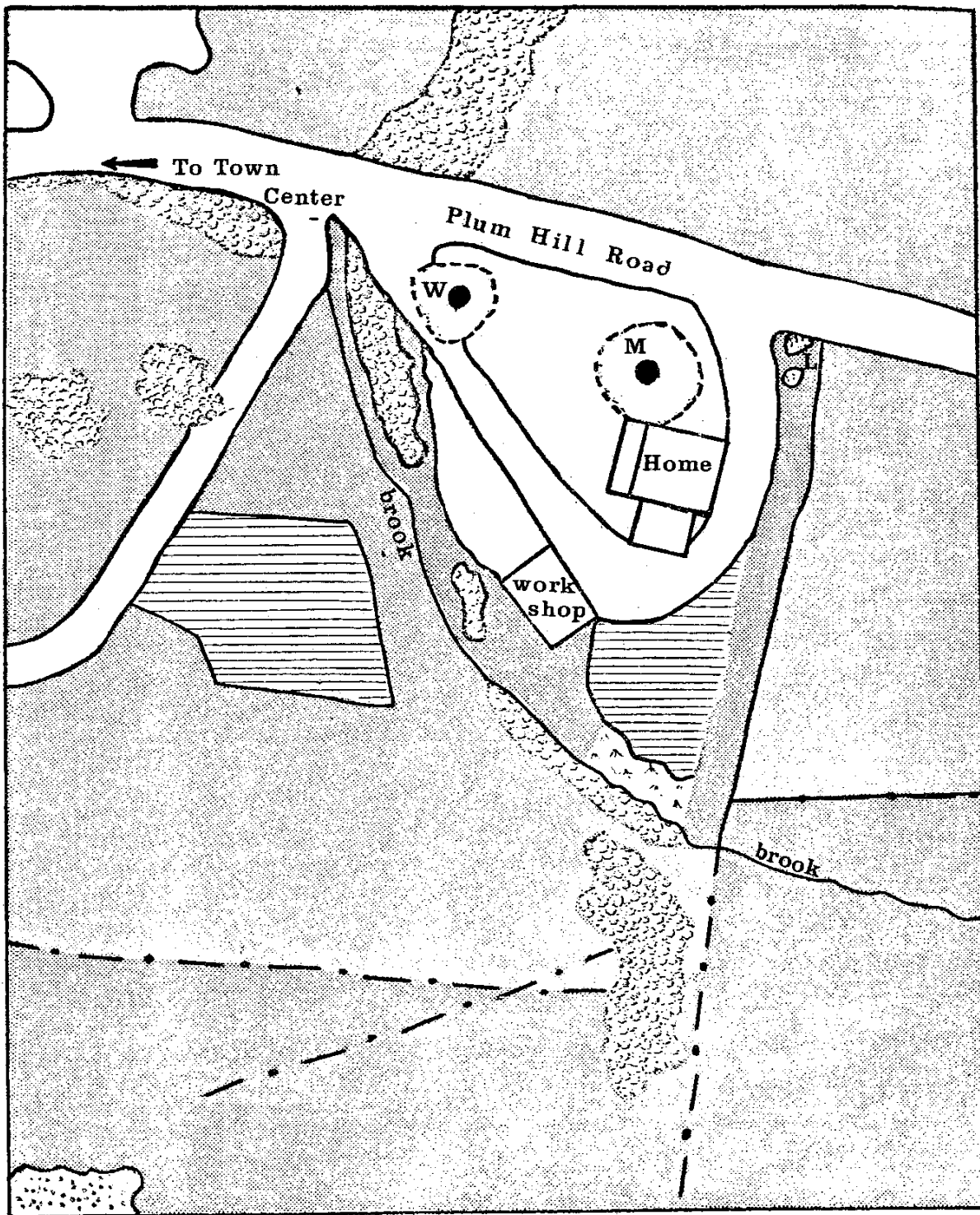
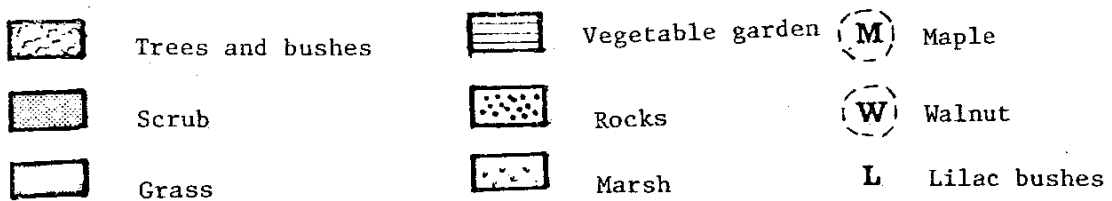


FIGURE 9-1: THE PLUM HILL FAMILY - VEGETATION



Spatial Activity and Use of the Environment

Davy

Davy's range is clearly defined. With no hesitation he offered precise markers for the boundary of this range when interviewed in August of 1972. The parents, when interviewed five months later, independently described the same range and commented that it had been this way during the summer (Map Figures 9-2 and 9-3).

The free range, where Davy may go without asking permission, was described by him in terms of specific features: "in the fields" (northwest side of the house), "to the strawberry patch" (across the brook to the southeast of the house). Davy's mother described the same set of places but provided in addition a more general explanatory statement: "He can go anywhere within sight, but he can't cross the road without telling me." Both mother and child know clearly that the bike may be used only in the yard. He may cycle around his friend's house across the road, with permission, but the bike must be taken there, not ridden.

The reason given by Davy's mother for restricting her son is simple: "Safety--I need to know where he is." Traffic and the reservoir across the road were two reasons given for wanting to know where Davy is at all times. She explains that this also influences her children's visits to the homes of other children: if she feels the parents of the host family will not watch them, she will not allow her children to visit.

On this basis Davy obtains permission to visit his friends on the hill, all of whom live within 400 yards of his house. He may also walk down the hill to the drug store for candy because, "He doesn't have to cross a main road" (the store lies on the southeast corner of the junction). However, I learned from the mother that this wonderful exception had only been instigated in the Summer of 1972 and was still not allowed on Friday evenings and during weekends because of the heavy weekend visitor traffic.

With his elder sisters Davy may go as far as they can go with permission. This enables occasional trips along Main Street West to the supermarket or up the hill road on long walks to explore or to collect plums. The parents encourage the children to play amongst themselves and there seems to be no problems caused by the three- and four-year age gap with his elder sisters; in fact, play is more frequent between Davy and the elder sister than between the two sisters themselves. No doubt part of this willingness comes from the practice in this, and in other large families, for the older girls to look after the younger children. (It is noteworthy that this pattern was not observed with families where the eldest were boys, but unfortunately there were too few such families to enable confident generalization on this issue.)

The parents expressed the belief that living away from other kids accounted for this willingness to play with one another: "It's so much easier for the kids down there (downstreet) to run across the street and find a friend than up a hill like this." But the advantages outweigh the disadvantages in the parents' minds. Downstreet, the children would be faced with the

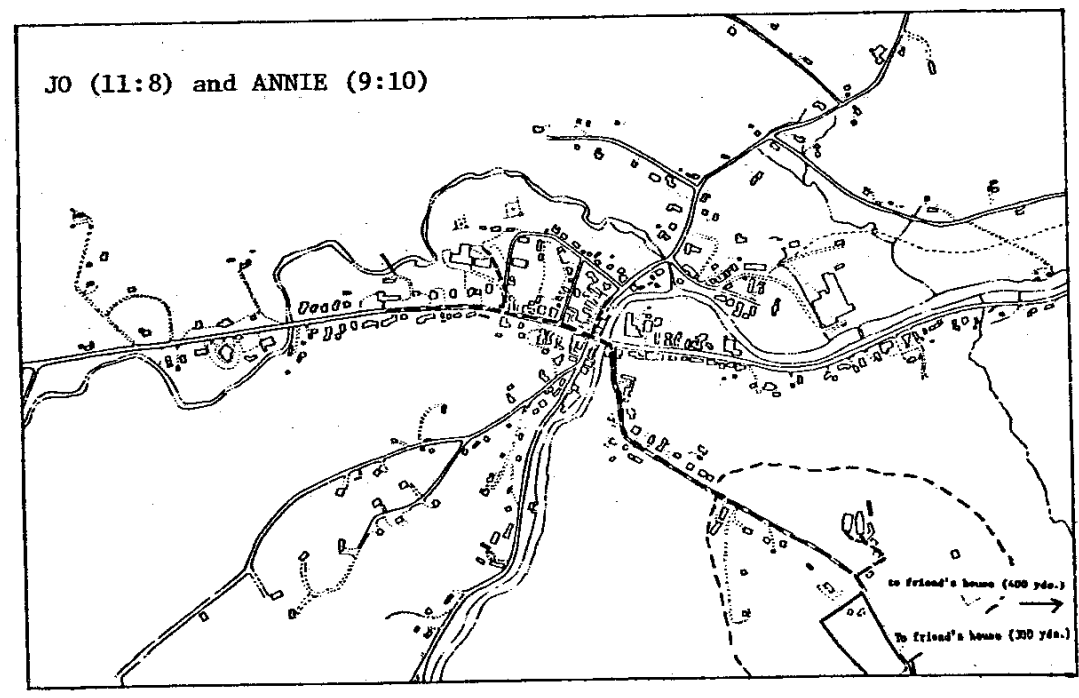
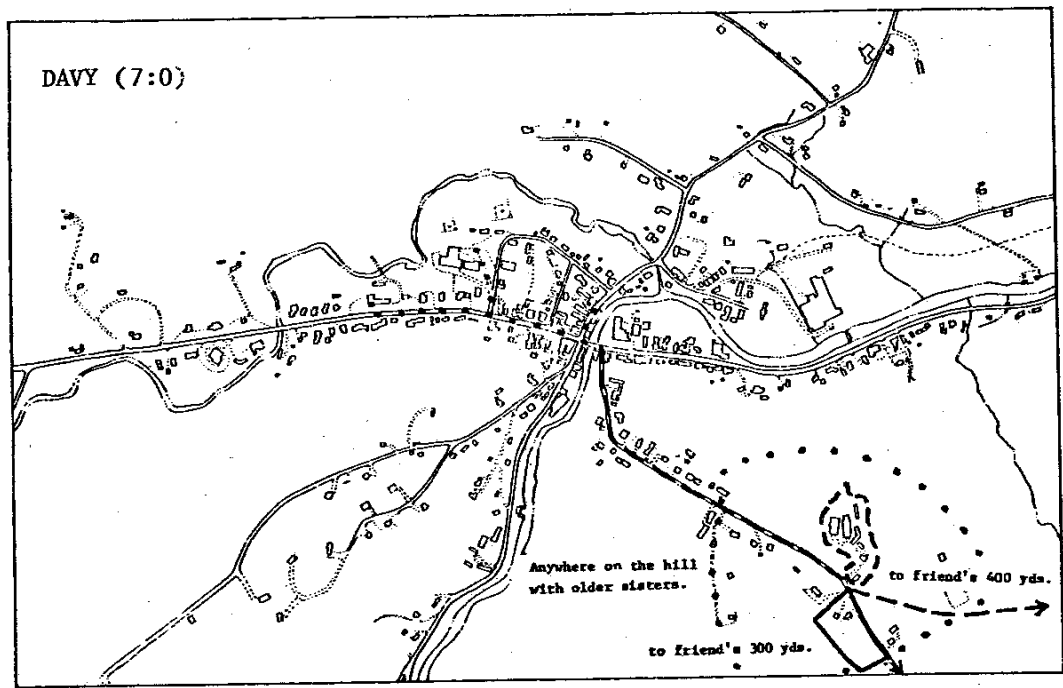


FIGURE 9-2: PLUM HILL FAMILY - PARENTAL RANGE RESTRICTIONS

- Free Range
 - - - Range with Permission
 - . . . Range with Other Children
- 290

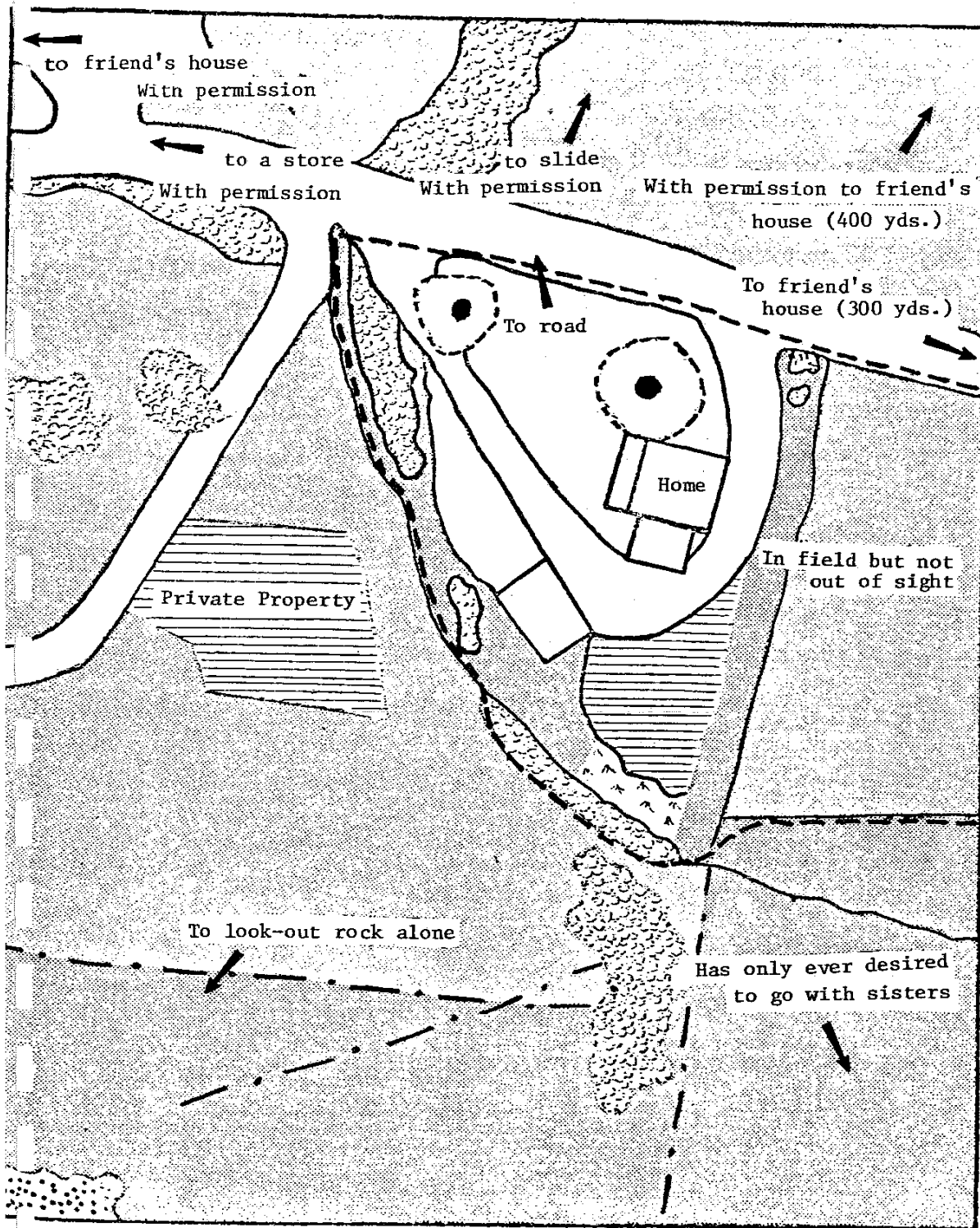


FIGURE 9-3: (DAVY) DETAIL OF PARENTAL RANGE RESTRICTIONS AROUND THE HOME
 - - - - "Free Range"

dangers of traffic, which are increased by their desire to go to places with other children. They would also be subject to "bad influences" (a problem which was actually mentioned during the interview regarding the two older girls, but the mother generalized the issue to concern for all of her children). The Robinson's fear of their children being close to other children who may influence them in directions contrary to the parents' wishes, and hence bring them to some kind of danger or bad practice, seems to be the greatest influence in determining the parental restrictions on spatial range. In confirmation of the formal answers of the parents, I frequently observed this attitude being exercised. The mother voluntarily pointed out that it takes a while for children to learn the rules of a new place and that her children may be led into danger by children who may choose to forget the rules and the dangers of their own home area. For example, she remarked:

I noticed a long time ago that if somebody else comes to play in this yard, they don't know the boundaries like the road, it's different at other people's houses.

(Father adds, "And to stay out of the shop while I'm not in it!")

(Mother) "Yeah, that's off limits even for our own kids unless their father is there."

Davy's relatively small spatial range and limited interaction with other children does not seem to be a constraint upon his development. The following section of this chapter reveals the rich variety of play activities and the highly differentiated landscape he created both alone and in cooperation with his two elder sisters. The diary record of one week of Davy's travels, as expressed in Map Figure 9-4 is a good representation of his summer spatial activities. Only two trips were made away from the home: one to the old gentleman's home up the road for a chat and two visits to the crossroads store for candy. In addition, he made three shopping trips in the car with his mother, brother and sisters. Unless it is a quick trip, for only one or two items, the children ask to go with their mother, and she usually agrees. These are social expeditions as much as they are shopping trips. For Mrs. Robinson the shopping trip is a way to escape from the confines of the home and meet friends in an informal manner. At the same time, the children enjoy the chance to see what is happening around the town. Typically, the diary record also included one trip to the ballfield to observe a Little League game and two visits to their grandmother three miles away. Though Jo's diary was kept during a different week of August, the pattern of her spatial activities is almost the same. The following discussion of the two girls describes how their range is generally similar to Davy's.

Annie and Jo

Annie's and Jo's range restrictions are but a little freer than those of their younger brother Davy (cf. Map Figure 9-2). The range of "free play" is identical, but the "permission alone" range extends further. On special occasions Annie and Jo are allowed to go beyond the downstreet drug store, to travel to the supermarket on errands or to the High School for school events.

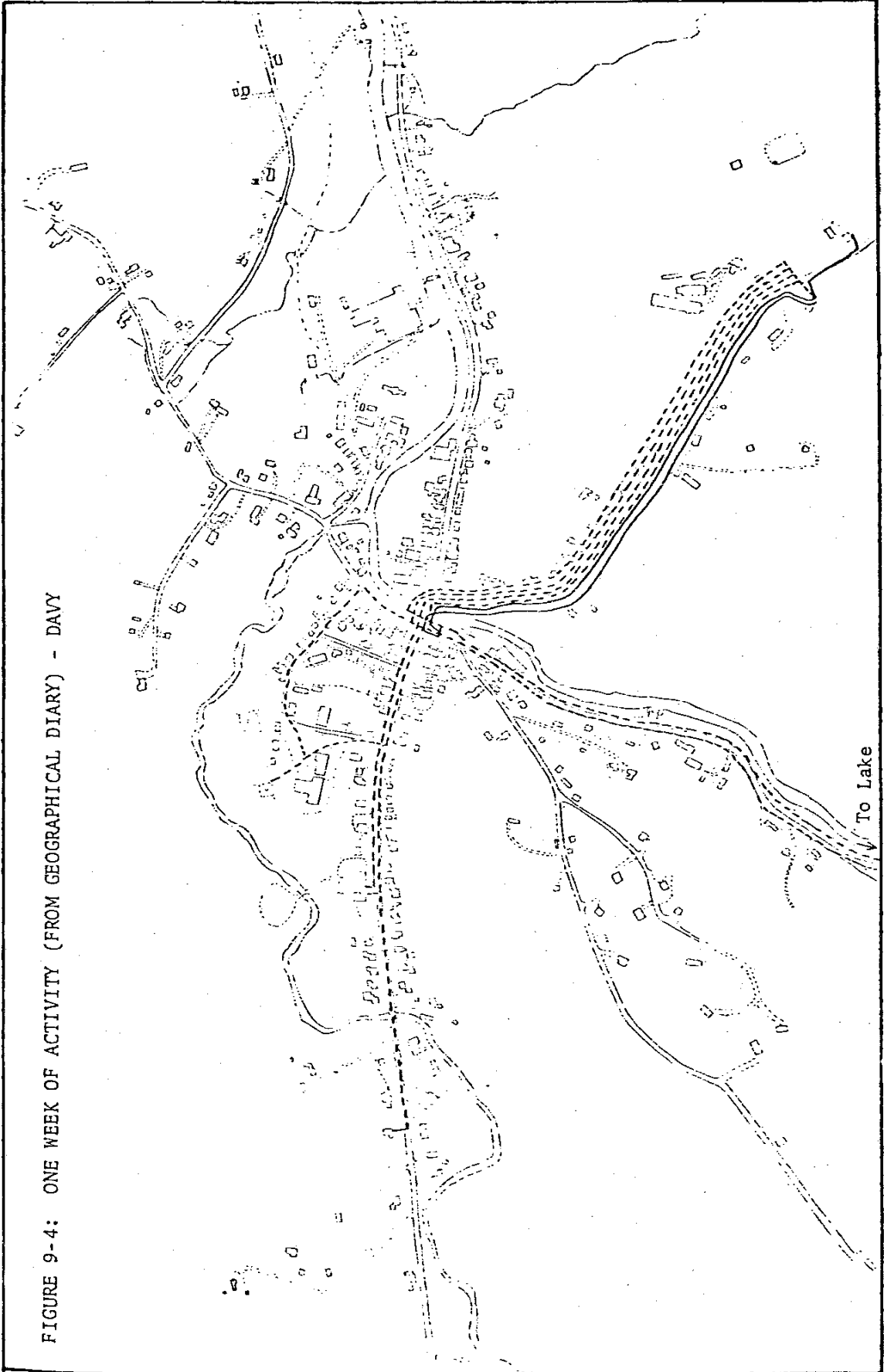


FIGURE 9-4: ONE WEEK OF ACTIVITY (FROM GEOGRAPHICAL DIARY) - DAVY

To Lake

The busy Main Street crossing is therefore no longer considered a barrier. However, these trips are only allowed for specific purposes, not for exploring or looking around:

(Mother) "I wouldn't let them walk around. It's really not a place for them to walk around, and the traffic is really bad."

(RH) "What is wrong other than the traffic?"

(Mother) "It's not supervised at the church school. The church school kids spend all their money on candy. And there are different characters around town, and drugs, but it's not as bad as a couple of years ago, so we told them never to accept candy."

Some elaboration of this collection of reasons is necessary. First traffic is not as high an order of problem to the mother as this account by her suggests. She allows the children to cross the busy Main Street for errands to West Main Street and to the High School for school events. She does not, however, allow either of the girls to journey eastward to the more appealing candy and knick-knack stores in that area. Later in the interview I learned that East Main Street is seen by the parents as a more negative place for children than West Main Street. The reasons for this can be found in the above quotation. The reference to "money on candy" relates to their oft-stated concern over the loose spending habits of many children. The parents believe other children are allowed too much freedom in general and hence fail to develop not only a sense of appreciation for material goods but also for good social conduct in general. The reference to "drugs" and "different characters" reflects their attitudes to the many youths who visit from out of town, as well as to more recent urban immigrant families to the town. East Main Street is seen as the center of this social trend. The seriousness of this problem in the minds of both parents was emphasized:

(Father) "If I ever find my kids in town and they're not there on errands from their mother, I'll spank them there in the street."

In fact, Annie had once broken these rules. The previous summer, Annie (then nine years old), a classmate and the classmate's eleven-year-old sister, had gone for a walk on a mile-long journey up her hill. The walk brought them to the main road well beyond the limits of the town. Here, the elder girl met a boy classmate and told the two younger girls to make their own way home. They did so, via Main Street because, they later explained to their parents, they thought it was quicker. The journey was actually considerably longer, but no doubt they found it more fun to make such an exploratory trip. After the mother had recounted this story to me, the father added affirmatively, "She soon learned what she couldn't do after that!" What this specifically meant for Annie upon her return we can only imagine, but punishment seems central to how most of the restrictions are learned. Children ask and are refused. These refusals are in turn comprehended by the children in terms of possible consequences of their failure to follow the rules. This they learn from previous instances of rule-breaking of similar type. As we saw in Chapter IV, there is some evidence that the breaking of range restrictions is more acceptable in boys than in girls. I have no such direct evidence of this with the Robinson family for such occasions are rare, but the stress laid on the limits to Annie's

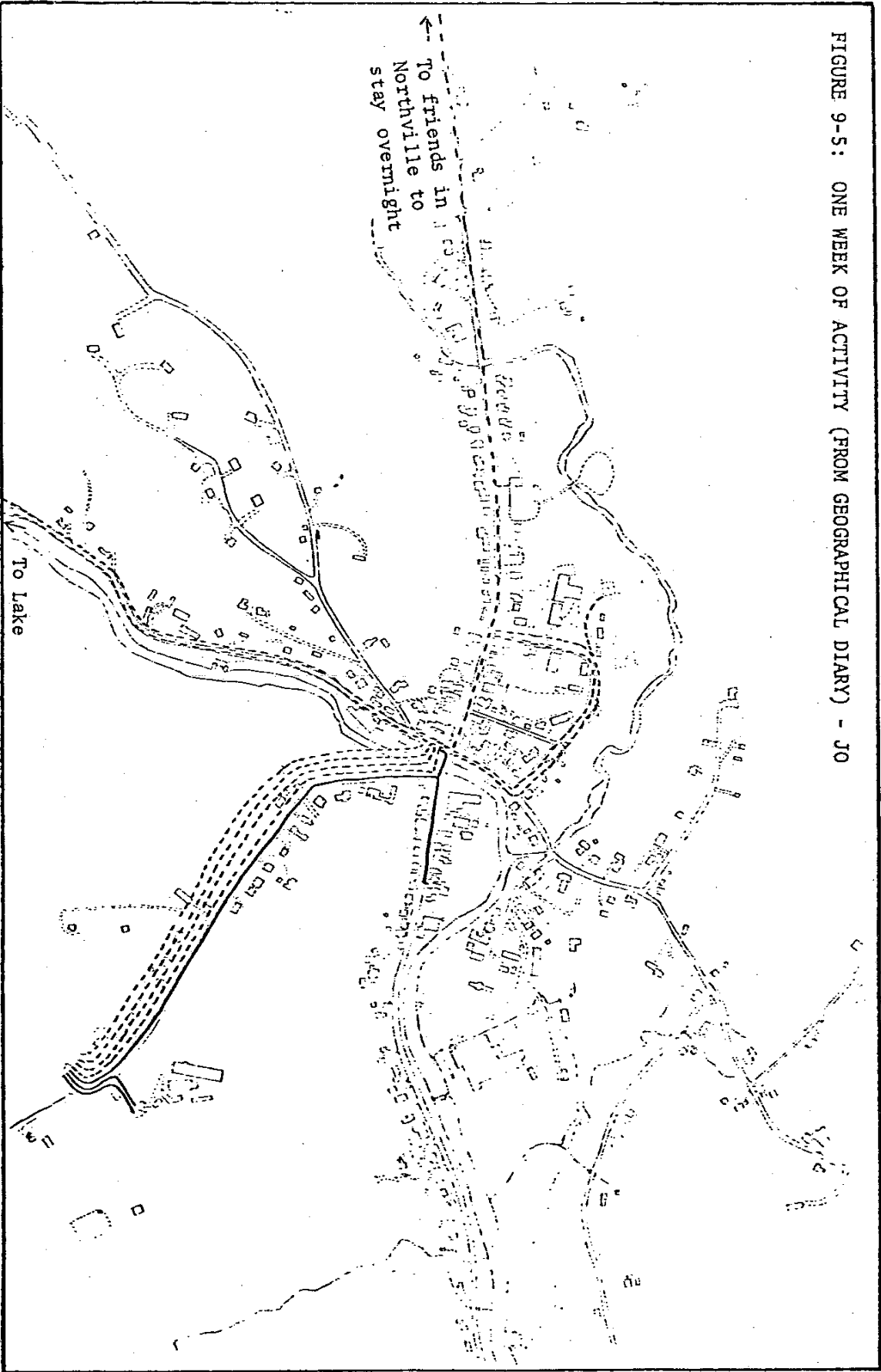
and Jo's travels accord with the pattern for most girls as they approach high school age.

The extent of the remainder of Annie's and Jo's "range with permission" is less easy to account for. Their mother is not very aware of how far the girls have been alone or together in the fields around the house. Mention has already been made of the shameful two-mile walk up the hill and back through the town. At a later date, I learned from Mrs. Robinson that she usually limits the children's up-the-hill walks to "the end of the blacktop, where the plum tree is. That way I know how long it should be (before they return)." Annie tells me that she, her brother, and her sister never go beyond the top of their hill. From there they can see for great distances through open fields to the woods and the mountains beyond. No friends' homes lie within this vista, and it is not too surprising that they have not travelled far in this direction. The southern boundary is less clearly definable. According to Annie, she had not travelled alone, or with her sister and friends, down through the fields to Main Street. However, these fields, with the reservoir hill for sliding, and the long grass for exploring, are the scene of many adventures with the two young girls across the street and with Annie's classmate in the next house below them down the hill. Trips to the north have always stopped one field short of the woods for both girls. During an exciting, but frightening, expedition to the fringe of these woods (to be described below), neither showed eagerness to lead the way, they argued with each other over who was to take up the rear until finally Jo was made to feel obliged, by virtue of her seniority, to do so.

In explanation of the extent of Annie's and Jo's range, we can only find a clear-cut reason for one of the boundaries, namely the social undesirability of East Main Street for young children in the minds of the parents. For the remaining boundaries the controls are more subtle. The parents have demanded that permission be requested for any trips beyond their own field. Permission seems to be granted for purposive trips. Exploratory trips beyond the visual field of the home would not satisfy the mother's requirement that she must know where the children are at all times. But not until a place has been explored and names given to specific places can children describe where they are going. Because of this, the only places visited by Annie in the fields beyond visual contact with her own home are those which lie within the parental zone of her friend's home across the street, of her classmate down the hill, or of her classmate beyond the reservoir. One exception to this is the dirt road behind the rock hills to the northeast of the house. This road had been discovered during the "place expedition" with me along the wood fringe to be described below. Finding it was an important event for the two sisters, especially for Annie. It meant that they now had a new familiar route which bounded an area that was safe to roam. With this information they used this area on a number of occasions in the following summer, confident to be able to describe to their mother where they were going and happy to have enveloped a new and interesting landscape.

Because of recurring sickness in the summer, Annie was unable to complete an entire week of her diary. A record of Jo's travels is expressed in Map Figure 9-5. The pattern is almost identical to that of Davy's (Map Figure 9-4), even though it was maintained during a different week of August. It differs from Davy's by its inclusion of two additional trips. One of these

FIGURE 9-5: ONE WEEK OF ACTIVITY (FROM GEOGRAPHICAL DIARY) - JO



trips was made to the East Main Street area. Jo had been able to persuade a couple of young married vacationing adults to go there for a walk and had in this way managed to convince her mother that visiting this normally out-of-limits area was acceptable. This was the only way she and Annie could find an excuse to visit the fancy clothing and gifts stores they were so fascinated by. They used this same strategy a number of times. The other feature of this map that differs from Davy's is also indicative of a basic difference in their spatial activity patterns. Jo visited Northville to spend a night with a girlfriend.

As was noted in Chapter IV, overnight stays and camping out alone are important stages in the children's minds. Davy was still not "ready," as his mother described it, for such an event. He had made an attempt to stay at his grandmother's house a few weeks before my interview with the parents in July 1973, but called his parents to pick him up because he felt lonely. His mother described how "his bed is his home, and he can't sleep without it." She explained how two days previously there had been two boys visiting his grandmother's neighbors. He had asked to stay overnight to be sure to be able to play with them the following day. But the next day he explained to his mother, "I've got a feeling I should stay with Grandma, but I've got a funny feeling in my head that I should come home to my own cozy bed." During the following summer he spent a few nights with his grandmother and he was most proud of the fact.

One further interesting feature of Jo's map is the loop taken by her in her mother's car around school street. One trip was made specifically to take Davy to the Little League field, but the other trip was part of one of the frequent exploratory-like shopping trips made by Mrs. Robinson with all of the children. In order to see if anything was happening at the ballfield, Mrs. Robinson commonly agreed to make this extra diversionary trip on the way home.

Danny and Emily

At the start of my first contacts with the Robinson children at their home in June of 1972, Emily was a baby of six months and Danny an infant of 16 months. I rarely saw them outside during that summer. Beginning in the following summer, however, I began entering observations of them in my log for they chose to play outside whenever they could; that is, whenever their mother or one of the three older children could watch over them. By the September of that second summer, Emily was almost two and Danny was two and a half. Most of the time they played in the dirt beneath the big maple or on their wooden horse, trike, or pull-cart in the driveway, but they began to experience some of the advantages of having older sisters and brothers. They would rush at any opportunity of being taken on brief walks along with the dog up the hill road to a friendly old gentleman's home. (The parents' fears of the bend below their home prevented them from allowing the children to be taken for a walk down the hill.). The two infant children were also able to play in the big field to the east of the house but this was also a special treat, allowed only when their mother was able to watch them,

I noted in Chapter IV that those children born later into a family

seem to be given spatial freedom. Following the comments of some of the mothers, I suggested that this might be the result of a growing liberalization as mothers become more familiar with the process of their children's environmental learning and more comfortable about loosening their rein upon them. My observations and discussions with the Robinson family, however, suggest that there is at least one other factor. Emily and Danny always have one of their older siblings close by. Because of this, their mother explained: "The younger kids see the older ones going somewhere and they want to know why they can't. I think that's why I've let them get away with more." And so it was that every time Davy set off for somewhere beyond the driveway and back garden, Danny wanted to follow. Davy did not relish child caretaking, but when his mother approved, he was willing to let Danny tag along as he explored the brook for snakes and frogs or hunted for ripe fruit in the immediately neighboring fields. Emily was much less exploratory, even during the following summer (1974) when of an equivalent age to Danny, Emily would only go at the direct encouragement of Annie, or, occasionally Jo, and never with Davy. Her relative shyness as an explorer may be related to her sex, but I cannot say; certainly she was fondled over, carried around, and watched over much more than Danny was or had been, by her sisters.

I feel that the greater number of trips away from the home by Emily and Danny with older siblings offered opportunities for them to learn about their own ability to deal with the environment, independent of their mother, than was true of their older siblings, who as infants always travelled to places with their mother. This greater competence in travelling away from the home seems to help their mother feel confident in letting them go to places alone at an earlier age. As was noted in the aggregate discussion of spatial activity, however, some mothers may be very restrictive with their younger child if they know this is their last one and feel a need to literally "hang on" to her or him.

Place Knowledge

Davy

Davy identified 84% of the slides in the place recognition test and thereby demonstrated that he was most familiar with parts of the townships which lie beyond the town. All of the places Davy did not recognize in the town lie beyond Davy's walking range: on Lake Road, Wood Lane, and Greenlawns Hill Road. Only one of the out-of-town slides was not recognized: the view of Meadow Farm. This extremely high degree of place familiarity was confirmed by the aerial photograph recognition exercise (See Appendix E).

During conversations, Davy's father frequently referred to Davy's interest while travelling and to his "photographic memory" for events. No doubt these comments of a proud father have an encouraging effect. I sensed that Mr. Robinson encouraged this ability particularly in Davy. While interviewing the parents, Mrs. Robinson commented that "Annie doesn't observe things in the car as much as Jo does; Davy doesn't either." "Oh yes," argues Mr. Robinson. "Perhaps when he's with you," retorts his

wife. This last comment was probably realistic for as will be shown in the discussion of Davy's land-use, his relationship with his father is much more that of a performing apprentice than is that of his sisters. When travelling with his father he picks up a great deal of information about the environment. His pride over place knowledge is demonstrated not only by his extended annotated performance with the place-recognition test, but also by his continuous references to newly discovered or secret places while talking with children and to myself. His exploratory nature within school where considerable social value is placed by children upon the ability to find new places, things, or uses for things is well recognized by his teachers. Knowing the location of animals is particularly emphasized by Davy, as it is by his father. And so, as my interview with the parents continued, Mrs. Robinson agreed with her husband about Davy, offering as an example of how on "Northville Road he saw an owl once and now he always says "there's where we saw the owl Daddy, remember it was up on the telephone pole." I too noticed an extraordinary emphasis on such place-related knowledge in Davy; a characteristic which made the place recognition test a wonderful opportunity for him to demonstrate an ability which was rarely utilized or encouraged in the school. (See complete transcript in Appendix E).

Davy's landscape model is extremely well structured and extensive. It is one of the only two models by seven year olds that are positional representations of the town (Chapter V). Not until nine years of age are the majority of children able to demonstrate such an ability. The most striking aspects of Davy's landscape model (Map Figure 9-6a and b) are:

- 1) Its small extent in comparison to his range of familiarity as scored on the place recognition tests.

- 2) Its close degree of correspondence with his range of free movement (Map Figure 9-2). There is an almost direct correspondence of these two maps, supporting the hypothesis by Lee that active engagement with the environment is necessary in the formation of topographical representations because it "articulates the schema" (Lee, 1960, reviewed in Appendix A-2). The one event added to the landscape model which had not been experienced directly, on foot or on bicycle, was the school. The inclusion of the school was required of Davy by the instructions of the test. That he was able to locate the school and the school journey with relative accuracy can best be explained in terms of a mental association of two separate sequences of events: walking to the candy store, and driving up Snowdon Road. He must have associated some elements of the familiar view of the school road from his frequent walks to the candy store in the center of the town, and some elements of the same view from a vehicle. This is most likely from his father's truck, for as already noted he shares the journeys through discussion with his father, whereas the school bus journey seems to offer little opportunity for observation and reflection (see also Chapter IV).

- 3) The only error in the spatial relationships of the landscape model lie around the library and the church (Davy's old kindergarten). These buildings were accurately related with each other, but the cluster is incorrectly coordinated with the remainder of the map. The buildings are placed

on the opposite side of the street, and inverted in sequence. As can be seen by comparing with Map Figure 9-2, this area lies beyond Davy's unaccompanied range. He had not visited the area on foot for over a year, when he had been accompanied to his old kindergarten in the church building. It is not surprising that these places are ordered topologically, remembered from the kindergarten free-periods spent on the front lawn of the library. The location of this region relative to the rest of his representation, on the other hand, was not difficult because of direct and frequent visual access to it from the familiar candy store in the center of town.

4) As will be seen from the following section, Davy did not map any of the places most important to him, even though they lay within the area shown in the landscape models. It is excellent support for the statements made in Appendix A-2 and the "Methods" discussion of Chapter IV concerning the inadvisability of relying on peoples' self-generated maps as expressions of both their known and their valued worlds.

Because Davy is an extremely verbal child, I learned much from informal discussions with him, while walking or driving to places, about his knowledge of the landscape, including his understanding of spatial relationships. Above all, I learned that the landscape model showed only a part of the landscape he could orient in and navigate through. This was also clearly exemplified in the place recognition test (see Appendix E for the transcript). My conclusion from this and from similar evidence from other children is that in this exercise, some children will only model those places which they know how to relate contiguously with already mapped places. Since they always begin with their home, these children will only map those places which they can link to their home area. Other children, however, feel quite free to map other clusters of elements which they know the internal organization of, even though they do not know, or are not sure of, how these clusters relate spatially to their representation of the home area. It is this qualification which most limits the confidence with which both quantitative and qualitative aggregate comparison may be made of the landscape model data.

Annie

Annie demonstrated more convincingly than any of the children how inadequate the landscape model procedure becomes for children of fourth grade level and older. After spending over four hours of one day modelling the town, she had laid out all of the roads in the town but there was much detail to add. She worked on the details for most of the following day. Like her classmate, Elliot (Map Figure 5-13), she chose to draw the entire model because she felt it would be faster (Map Figures 9-7a and b).

Annie said she could have continued Plum Hill until it meets another road which joins on to East Main Street but she was not certain of its shape. She learned this of course from her daring circumvention of the town via this route which was dramatically described to me by her parents and reported under "Spatial Activity." She also explained that there is another road (Farm Road) past the school, which is one way of reaching Lake Raponda (Map Figure 9-2) and that this too makes a circular route because it joins on to the Middleton Road. She knew this because it is the route she most frequently

travelled with her parents in order to visit her grandmother. Again she was not confident about the detailed configuration of this route and chose not to draw it. In all other respects, the model reflects her experiences in Inavale.

Even though a number of children of Annie's age were able to lay out the basic structure of Inavale before filling in detail, like her they still frequently depended upon the more egocentric route-type system of representing the town which so dominates the younger children's maps. This more egocentric system of reference seems to be commonly employed in representing newly experienced places. One such example was Annie's desire to map "the hill my father's working on now" (Bear Hill). She described details of it including the names of two schoolchildren whose homes lie on it, but she could not decide where the hill begins. Expressing considerable frustration, she returned bodily to her home across the gigantic model and retraced the route on foot which she had travelled in her father's truck. In this way she determined that it begins on Snowdon Road, somewhere between Greenlawns Hill Road and Meadow Farm. She had previously spent much time searching her memory to think of the many places which she knew must be along this road. Because it has always been experienced by her in a moving vehicle, she found it difficult to remember, but as she began to draw Bear Hill Road, she was suddenly reminded of two restaurants which are associated with her father's journey to work because he often stops at them. This accumulative series of associations is reminiscent of the sequential manner in which the younger children's models grew as they retraced certain trips. Following the more theoretical terminology used in Appendix A-2, we could say that Annie reverted to using an egocentric system of reference because she has had insufficient opportunity to assimilate this new experience into her existing schema for the town. I believe the combination of an abstract system with the recall of concrete journey experiences along routes, is common to even the most advanced of child mappers, and is probably true of adults as well. With all of the children, like Elliot and Casey (Chapter V, Map Figures 5-13 and 5-12), who began by laying out the basic structure of the town, the majority of detail on the models was completed by proceeding from the vicinity of the home outwards, from the familiar to the less familiar.

Place Feelings

It was through the Robinson family that I became truly convinced of the inadequacy of interviewing as a method for discovering some of the more important feelings children have toward places. I learned from my first expedition with Davy that he had both a great fascination for and a fear of the woods behind his house, the supposed location of a bear cave and its imagined very live inhabitant. Extracted from the log for September 9, 1972; "Expedition to the Woods": Davy had listed the bear cave in the woods as a favorite place but seemed very unsure about taking me there. We headed out first to a hill nearby which he had said he likes to go to because you can see down into the big ditch. I couldn't discover why he liked looking down on this ditch, but it seemed that he related it to one particular day when he'd thrown things at the girls who were down in it. Clearly he liked the big rock and the view it provided all around, so, at his request, I took a photograph of him on the rock.

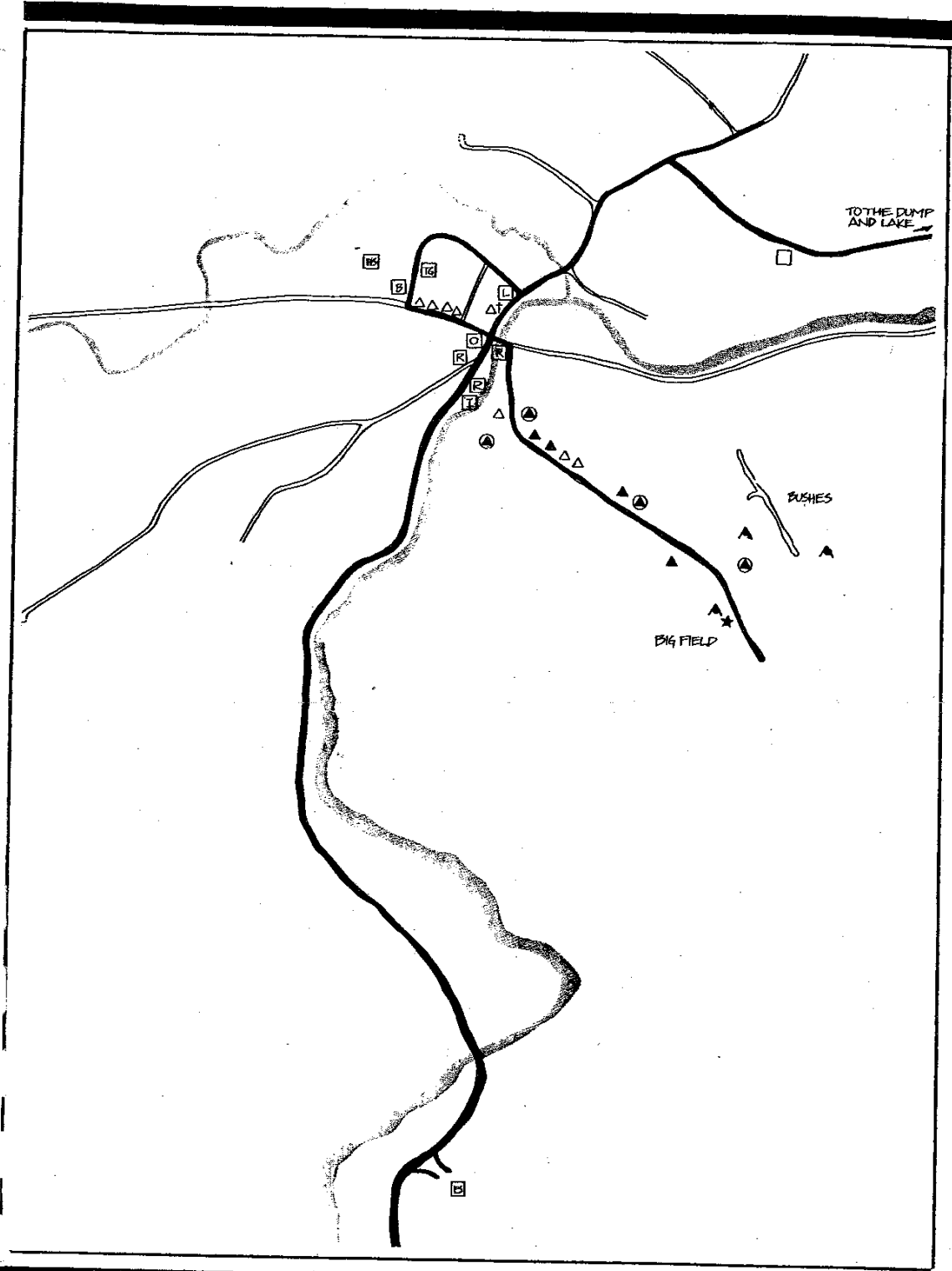


FIGURE 9-6a: DAVY (6:11) - CONTENT ANALYSIS OF LANDSCAPE MODEL

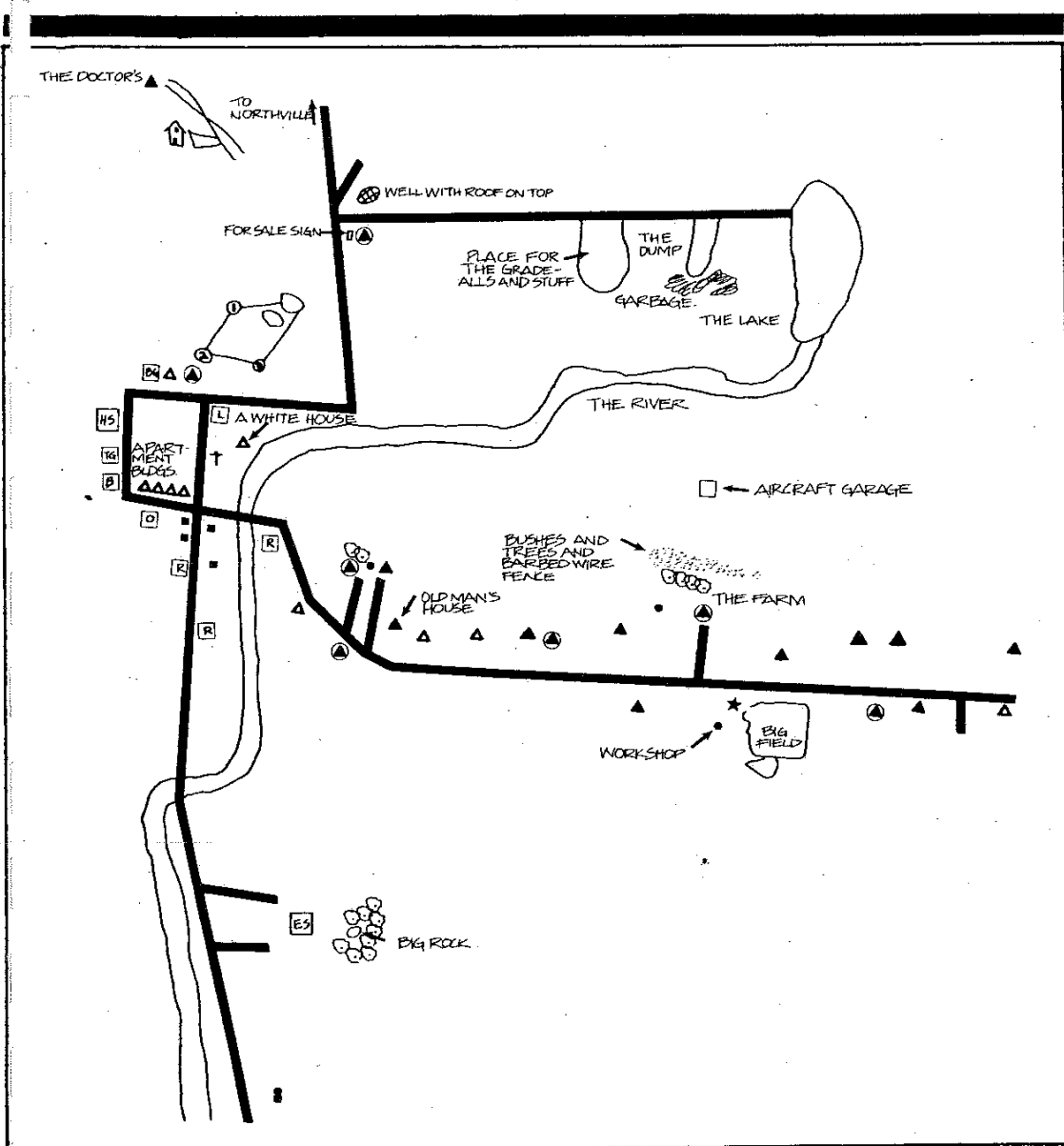


FIGURE 9-6b: DAVY (6:11) - LANDSCAPE MODEL

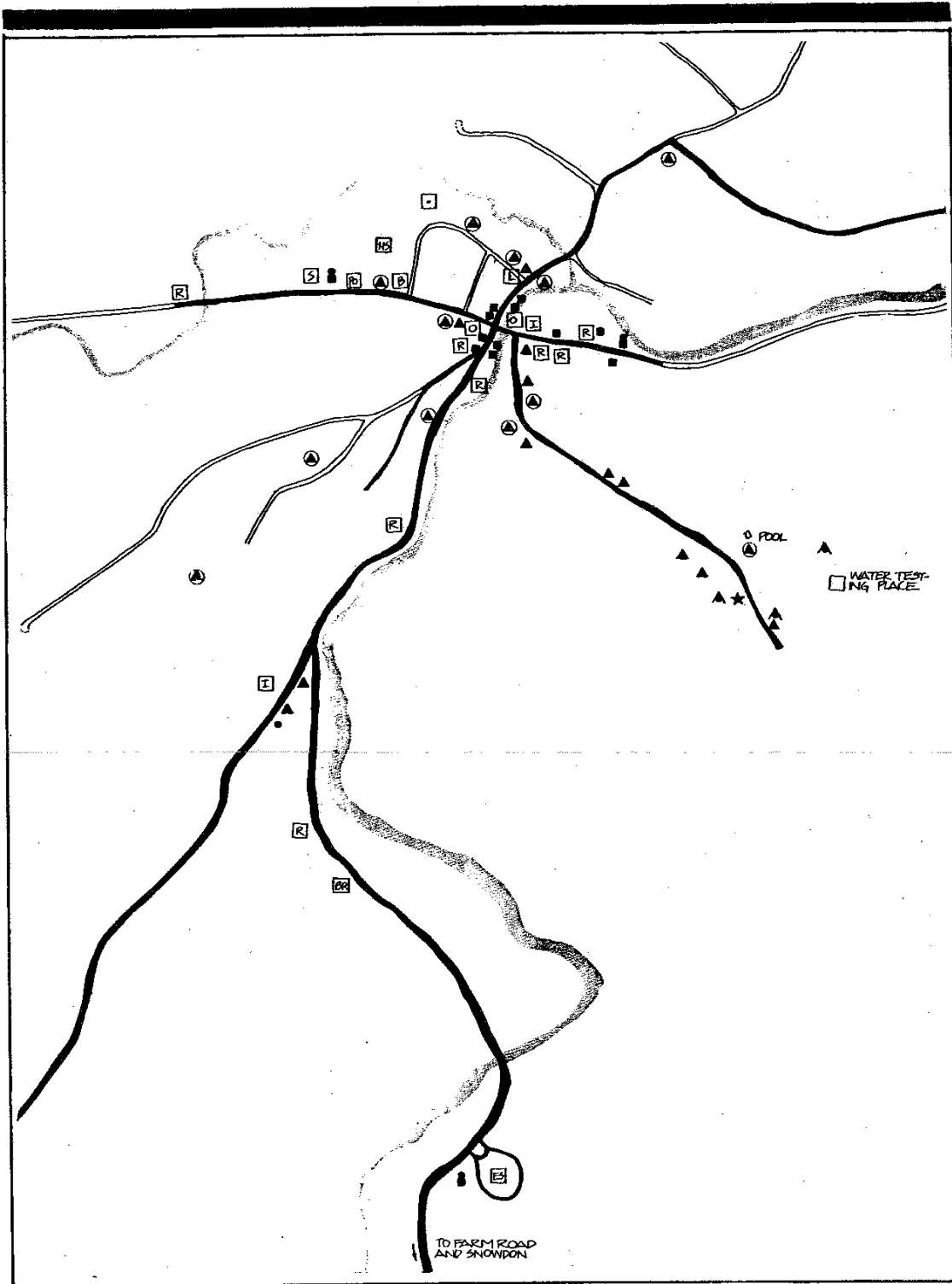


FIGURE 9-7a:ANNIE(9:8)-CONTENT ANALYSIS OF LANDSCAPE MODEL

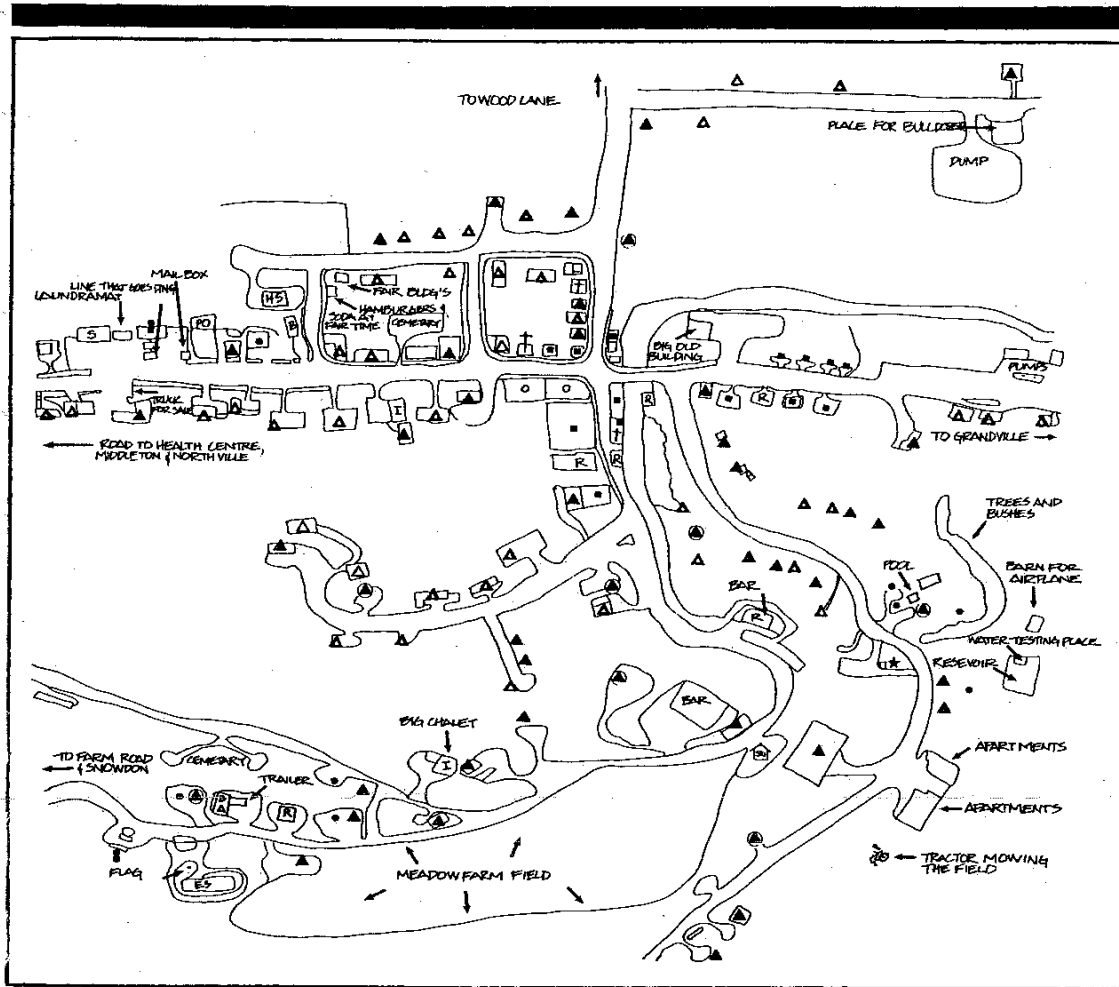


FIGURE 9-7b: ANNIE (9:8) - LANDSCAPE MODEL

On to the bear caves. From here on Davy seemed to have no idea where to go. In fact, he had never been beyond this rock alone and neither had Annie, even though they had travelled widely up and down the Plum Hill Road and the fields in front. Jo had travelled once to the stone wall next to the woods with her classmate Joni and her horse, but never into the woods. Jo offered to lead the way but pretty soon I realized she hadn't got much idea where we were going, either. As we crossed the first stone wall, Davy began to stick close by me and both he and Annie expressed fear. At the second stone wall there was even more uncertainty and it was made clear that I should go in front as soon as we came upon the area of sodden grass on the other side of the wall. We were now within 200 feet of the woodline. We found the remains of an old, very small building. Davy thought the remains of the small building was the sugar house that he and Annie had visited once with their father on his "skidoo." He remembered there was a plank leading in through the doorway because it had moved when he stepped on it and scared him.

As we continued on toward the woods, Davy would periodically go through an almost ritualized dance, exemplifying the ferocious bear and his own ability to deal with it. Davy became so anxious that his body seemed to shake. I reminded him that we could go up to the rocks instead, if he wanted. But he grabbed hold of my back and continued on, though more faultingly with each step. Annie also seemed very nervous.

We stopped on Davy's and Annie's strong urgings just inside the woods. Here Annie found some tracks which she was sure were a dog's, but five inches from a single dog's paw there was a single "deer's" paw. "The dog was chasing the deer, you see." This remark was made with great confidence, for considerable value is placed by these children on being able to explain where things are in the environment and how they work. I personally doubted the deer-dog theory, but the children knew I was not competent to propose an alternate theory. Davy was not interested in such details. He had started on first hearing of "tracks" and was making clear his desire to leave.

We came out of the wood and followed the edge of the trees but Davy was so frightened that I could see him fighting back his tears. I lead a path about 200 yards from the treeline, and he seemed less nervous. Still, he and Annie strongly insisted that I lead the way, and that Jo take up the rear. Davy frequently glanced behind him, no doubt to check that the bear wasn't coming up on us. We followed the line of the woods and Davy and Annie seemed happier as we moved away from the area where they were convinced their father had seen the bear.

All this time Davy had punctuated his fear with excitement over discovering in turn--a raspberry patch, a blackberry patch, a large caterpillar, and an apple tree. His face seemed to indicate great glee and complete lack of fear even on the edge of the woods where a few seconds previously he had been literally trembling.

We came upon a house still very close to their home, which Davy and Annie had only seen the lights of before. They carefully approached the house and began to explore the various objects around it while developing fantasies about the owners of such a deserted but new-looking house. Davy took a few

steps down the driveway of the house and then spun with great excitement, declaring to us that he had discovered a new way back because he could see Rusty's house down the road. His eyes rolled with amazement back across the area between the woods and this "new" road as he declared we could go "anyway back if you wanted." His trepidation over exploring these distant places vanished as he tore off to the highest point nearby to further his exciting discovery. All three of the children were so happy to find a new road leading back to a most familiar place that they jubilantly raced along it to Plum Hill Road and thence back home, not failing to stop at their special "Resting Rock."

Place Preferences

Having recognized in advance how much the Robinson children played with each other in places very close to the house I was doubtful how successful I could be in conducting the place expedition method in such a way as to reveal any unique aspects of their place feelings. I feared they would imitate each other's preferences. For this reason I asked each of the three older children to sit down in different places around the home and simultaneously create a list of their favorite places. After they had each done so, we all came together and compared the places. None of these children were able to limit themselves to ten places: Davy, Annie and Jo all chose 17 places.

TABLE 9-1

(DAVY, ANNIE, AND JO)--PLACE PREFERENCES

1. By the reservoir-sliding hill (Davy, Annie, Jo)
2. The roof (Davy, Annie, Jo)
3. The apple tree (Davy, Annie, Jo)
4. Lake--at Grandma's (Davy, Annie, Jo)
5. The big resting rock (Davy, Annie, Jo)
6. The plum tree (Davy, Annie)
7. The drug store (Davy, Annie)
8. Back of the hill (Davy, Jo)
9. Frog pond (Davy, Jo) - also for hiding (Jo)
10. Cave on the hill (Davy, Jo)
11. Trees-side of driveway (Davy, Jo)
12. Father's work place (Annie, Jo)
13. Strawberry place (Davy)
14. Stanley's airplace place (Davy)
15. Other frog place, behind the workshop (Davy)
16. Old sugar cabin (Davy)
17. River-down street (Davy)
18. The look-out rock (Davy)
19. Milnes' house (Annie)
20. Home at Christmas time (Annie)
21. Sybil's house (classmate) (Annie)
22. Laurie's house (classmate) (Annie)
23. Back of father's truck (Annie)

24. Carrols' tree for climbing (Annie)
25. Father's workshop (Annie)
26. Tall grass in garden (Annie)
27. Ginnie's house (Annie)
28. Under the big maple tree (Jo)
29. Under the lilac tree (Jo)
30. Out in the stream (Jo)
31. The weeping willow tree (Jo)
32. Near the flower garden (Jo)
33. Raspberry patches by the stream (Jo)
34. Clover patch (Jo)

The most remarkable quality of these lists is the high degree of consensuality in place preference (Table 9-1). Lowenthal (1960) had suggested the opposite of this for children but clearly this is dependent upon their circles of activity. If, like many children, Jo, Annie and Davy had small, relatively private, and hence unique, ranges of activity, we might have expected their "worlds" to be more unique.

In order to better understand in what manner these places are valued, I decided to visit those places that were consensually selected with the children as a group and those which were uniquely selected with each child alone. Each child's place preferences are separately discussed below. The qualities which made these places special are summarized in Table 9-2, and their locations are expressed in Map Figures 9-8, 9-9 and 9-10.

TABLE 9-2

QUALITIES OF FAVORITE PLACES -- DAVY AND ANNIE

DAVY		ANNIE	
Hunting, fishing, collecting	4	Sensory qualities (cool, warm, wind)	6
Looking-out places	3	Like the people there	5
Exploring	2	Collecting	3
Buying stuff	1	Sliding	2
Climbing	1	Buying	1
Hiding	1	Climbing	1
Resting	1	Hiding	1
Sliding	1	Fighting	1
Unclassified (river, air-plane place)	2	Resting	1
		Swimming	1
		"Special" (symbolic)	1

Davy

The most striking aspect of Davy's list of places is that 12 out of the 16 are "natural" places - ditches, hills, bushes, trees, rivers, lake, cave, and rocks. Of the remaining four, none are people's houses (Table 9-1, Map

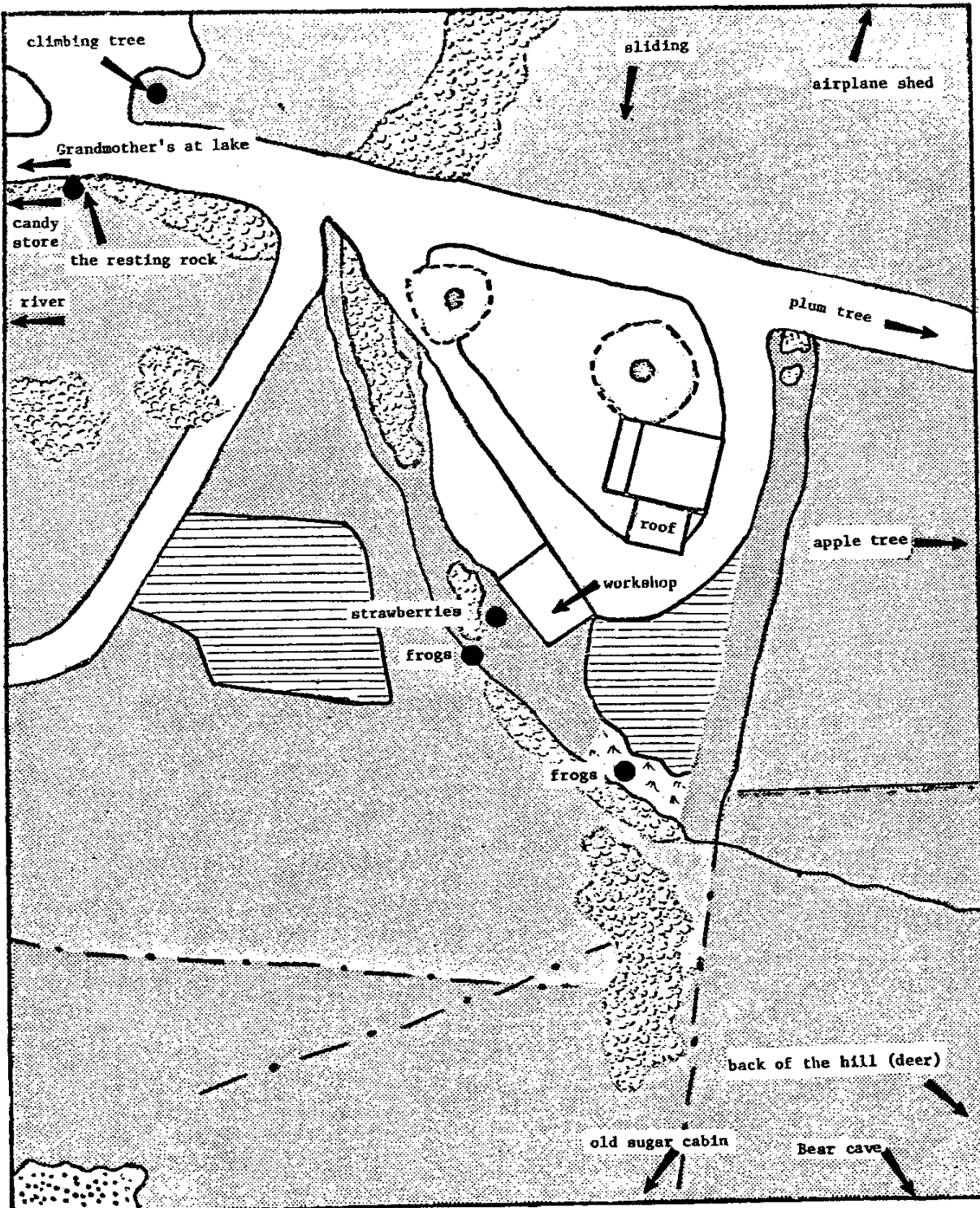


FIGURE 9-8: DAVY'S PLACES

Figure 9- 8). This simple analysis accords with the view of Davy from records of his land-use; he is out-going with the physical environment, an explorer, investigator, hunter, collector and builder. One aspect of this list which was not previously noted is the importance of look-out places. This is an understandable preference for an explorer, and in fact, from reviewing the log records of our walks together, I am reminded of his frequent desire to head for a knoll to look out. This desire does not seem to be related to any aesthetic interest in the landscape, though he mentions that one of the places is valued because he can see the deer from it. The importance of landscape views was rarely mentioned by any children either in the interviews or informally. Davy commented during the panoramic scenes of the photo recognition test that he thought North Hill had a beautiful view, and that is why his mother would like to live there. This was often stated to me by his mother, and we may be certain it is from her that Davy gained this particular aesthetic perspective. More commonly, it was not until they reached 11 or 12 years of age that children expressed their own visual aesthetic interests in any landscape panoramas.

Annie

In marked contrast to her brother and elder sister, Annie's stated favorite places were not natural places (Table 9-1, Map Figure 9- 9). Because Annie gave more than one reason for choosing these places in most cases, there is a total of 24 reasons. They are categorized in Table 9-2. This set of reasons is different from that offered by Davy (Table 9-2). The first two categories of place-qualities did not even appear in Davy's list. That Annie should mention the sensory qualities of places so many times in describing the attributes of her favorite places and Davy not at all, accords with the aggregate comparative analyses of the favorite places of girls and boys (Chapter VI). That the remaining qualities are similar is not surprising, for seven of Annie's favorite places were independently chosen by Davy (apple tree, drug store, lake, plum tree, roof, reservoir, and resting rock); further evidence of the degree of shared play by the children of this family.

Jo

Jo's place preferences resembled Davy's more than Annie's (Table 9-1, Map Figure 9-10). Nine places were selected in commonality with Davy, whereas only six places were jointly chosen by the two sisters. Only one place was selected jointly by the two sisters and not by Davy, and that place (their father's work place) they took turns to visit, so that it was never experienced by them together.

Most of Jo's favorite places (15 out of 17), like Davy's, were largely made up of "natural" elements. The remaining two were her grandmother's home by the lake and her father's workplace. This contrasts not only with Annie's selections, which included four girl classmates' homes, but the general tendency, reported in Chapter VI, for girls to choose "social" places. It has already been noted under the discussion of land-use that Jo has a more outgoing active constructive relationship with the environment. On many occasions I attempted to subtly discover if there were any identifiable factors

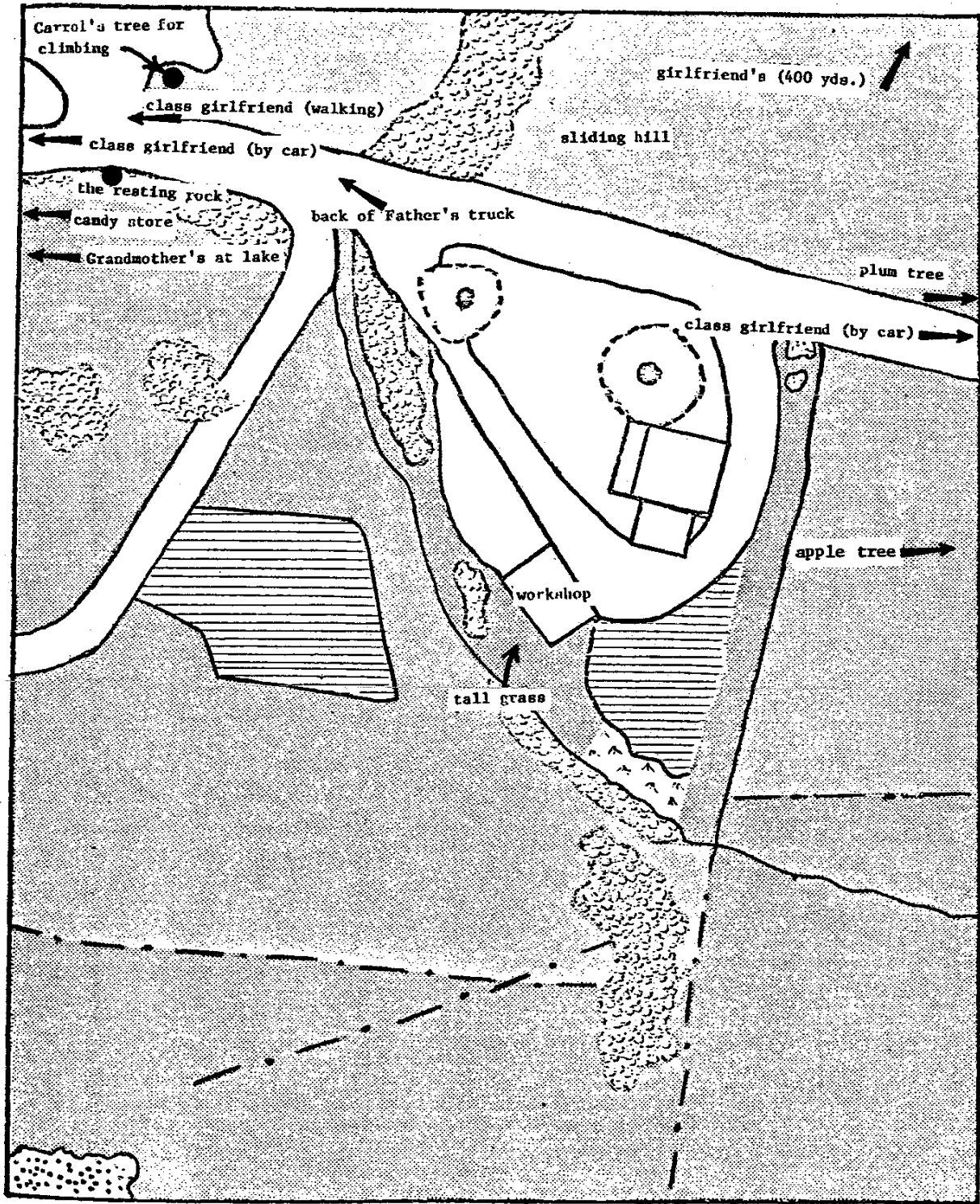


FIGURE 9-9: ANNIE'S PLACES

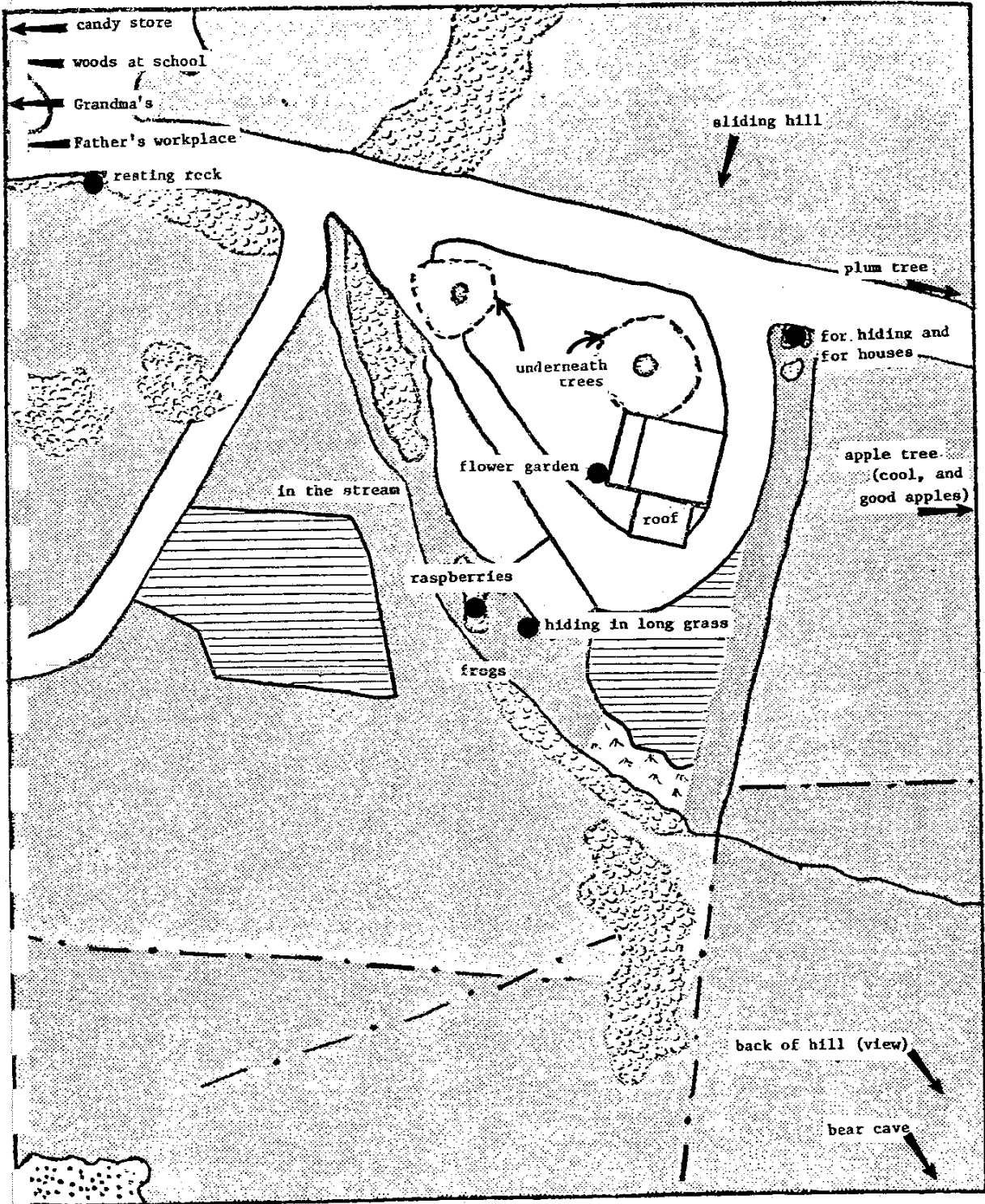


FIGURE 9-10: JO'S PLACES

influencing such differences in the parents' minds. Mrs. Robinson had volunteered once that Annie "was not a tomboy like Jo." Similarly, in discussing the children's work trips with their father, she explained that "Annie goes, too, but she's not as interested in going to work as Davy or Jo are." In explanation she suggested that it might be related to the greater trouble Annie had with sicknesses which had caused her from an early age to spend more time inside, but she seemed to believe more that it was an innate difference in personality.

Places of Retreat

Both Davy and his parents considered Davy's bedroom the place he goes to when he wants to be alone, especially when he is sulking. His parents explained that he calls it "his room" even though he shares it with his younger brother and sister. He really wanted to share it with just his brother, Mrs. Robinson explained, "because he has always wanted to play baseball with him." Davy explained that when he is upset, he goes upstairs to his bedroom and plays with his war set.

In thinking of places where Davy plays alone, his parents suggested; "up in the willow tree (west side of the house) - he used to go up in it and sit before this winter when it got knocked down in the ice storm"; and "below the maple in front." In the following May, four months after this interview, while asking Davy's sister Annie what she was making under this same tree, the parents' observations were confirmed. It was explained that Davy had a special place for his "home" (a six-inch square lump of turf at the base of the tree trunk); in Annie's words: "None of us can use it, it's always his."

When asked if there was a place he felt was his or where he really belonged, Davy answered with a dream:

Someday I want to make a tree house and tell no one about it and I'll keep it locked. We're making a fort but there's only one side up. I feel like it's all my own. When I make snow forts with Annie and Jo, I feel like it's all mine - like I want to just have it all to my own.

His parents answered this same question differently. Davy's father felt that Davy considered the vice in the "shop" (back of the house) his own: "He tinkers there for hours and has his own real tools." As previously noted, Davy is frequently encouraged in this kind of activity by his father. The parents explained that he lets Annie use this corner, too, and that they often build things together, but that Jo, the eldest girl, "cannot work with him for three minutes before there are arguments; she doesn't last interest in things like Annie."

According to Annie, to be alone she sometimes likes to go to her room or the bathroom and just sit. Other times she likes to walk up and down the hill alone. She complains that her brother Davy "always tries to tag along, but I sneak away up the hill in the long grass." Her parents independently described the bedroom and the top of the hill as Annie's places of retreat during my interview with them, and they described how very different

Jo was in this regard:

No, she doesn't go to her room like Annie does. She doesn't tie herself down to places. She's loose, she'd rather be with people.

In marked contrast,

Annie loves building little nooks, especially up in her bedroom. She likes the bottom bunk so that she can hang blankets down. She likes to play in the bedroom more than Jo. She's a loner; she goes up there all for herself. She'll draw pictures or play with her dolls . . .

Similarly, they explain, when at her grandmother's she is "happy to be alone sitting on the dock sketching pictures of the lake or playing with Red Efs (lizards)."

Disliked Places

As with other children throughout the town the Robinson children seemed unable to identify disliked places. In contrast to the fluid manner with which Davy expressed his 17 favorite places, he searched his brain for some time and then could recall only one disliked place; the store in the center of town which charges too much for everything! This is not to say that there are rarely places which the Robinson children dislike, for I am aware of dozens of such places, but rather that the information does not seem to be as immediately available for recall. Disliked places, it seems, become "no-places" rather than negative places. Environmental behavior in Inavale, seems to be largely a matter of moving toward positive poles rather than away from negative ones. An alternative explanation is that the children would avoid discussing disliked places because they are disturbed by recalling such places. I found this explanation less plausible as their descriptions of dangerous places were frequently so vividly disturbing.

Place-Use

Due to sickness, summer camps, and overnight visits, Davy and Annie maintained their diaries for only five days; Jo kept hers for the full seven-day period. The place use and activities are broadly categorized in Tables 9-3, 9-4 and 9-5. The diary periods were, unfortunately, brief and only the simplest of extrapolations may be made from this evidence alone. My formal observations of this particular household were also limited in extent. Because of the location of the house on a hill, the children almost always heard me coming in my car, well before my arrival, and collected each other together to greet me. By the time I stepped out of the car, plans had already been laid to tell me the latest story, or show me their most recent find. Nevertheless, the diary and log record data of the tables support each other and provide some indication of the relative frequency of use of those places entered in the all-inclusive land-use maps, and of patterns of interaction

between the children.

A most surprising feature of the family, illustrated both in the diary records and log records, is the large amount of time Davy and his two sisters play together. At school, during the two-year period of my observations, when Davy was at the first- and second-grade class level, the only time he or his male classmates ever played with the girls was in chasing games (see Gesell's account of this age level, Appendix A). At home it is different. Davy has no male peers living within his free range. Furthermore, Jo and Annie had been his babysitters for so long that they had learned to play cooperatively with him. According to the parents, and confirmed by my observations, they each played "better" (with fewer disruptions) with Davy, than they did with each other. The parents felt the explanation lay in the competition and jealousy resulting from their being the same sex; I felt that their superiority in age over Davy and their history of a child-care relationship with him was perhaps an additional factor. Another related feature of these diary records, in comparison to the majority of the 25 diary-keepers, is the very small number of times the Robinson children play with other children. This is in part related to the location of the family, but it is also related to a conscious direction by the parents to discourage visits to the house by most other children and to clearly prescribe those children which Jo, Annie, and Davy may visit and limit the frequency of those visits. It is in this way that the family makes itself a relatively "closed family," to use the terminology of Simmel (1970), described in Chapter IV. The relative isolation of the family might be thought to account for the social inaccessibility of the children, but this, according to the parents, is as they chose it to be. Had they the opportunity to move anywhere else in town, they would purposely choose a location that was similarly isolated from other families of children.

Out of the 52 visits made when Davy was at home during the first year, I found him playing out-of-doors 22 times. The relatively high frequency of use of elements of the "natural" environment by children, suggested by the aggregate analyses of the previous chapters, is brought into even greater focus in this and the following family studies. The most frequently observed play by Davy was dirt play: building roads, towns, or airports, usually with one of his elder sisters (six observations). The pond and brook in the rear of the house were, as with children throughout the town, places where Davy could happily spend time alone and on five of my visits I found him alone in one of his numerous special frog and salamander places. Fort building, by contrast, was almost always a shared activity with his sisters. The number of times housework was recorded by Davy in his diary during this week is higher than the average for all the diary-keepers as a group, but not unusual for the large families in the town. The frequency of recording television viewing, both morning cartoons and evening family viewing, was typical. Of the remainder of the diary activities recorded, only dirt play emerged with a notably high frequency.

Due to "4-H" Camp and sickness, Annie's diary record was very spotty. Jo's record (Table 9-5) was complete, however, and it breaks down into a set of activity categories remarkably similar to those of Davy's diary (Table 9-4). The two most frequent outdoor activities represented in Jo's diary were dirt play and bike riding. Indoors, watching TV and cleaning

TABLE 9-3
DAVY'S LAND-USE (OBSERVATIONS)

<u>Frequency</u>	<u>Place</u>	<u>Activity</u>	<u>Who With</u>
6	Beneath maple tree	Dirt play - roads, towns or airport building	Elder sister(s) or alone
5	Pond & ditch	Fishing and catching frogs	Alone
4	Bushes	Fort building	Sisters
3	Driveway	Bike riding	Alone
1	Driveway	Chasing butterflies with net	Alone
1	Driveway	Pulling younger brother in wagon	Brother
1	Road	Walking up hill	Girlfriend neighbor
1	Porch	Watching thunder-storm	Mother and sisters

TABLE 9-4
DAVY'S LAND-USE (DIARY)

<u>Frequency</u>	<u>Place</u>	<u>Activity</u>	<u>Who With</u>
7	inside	cleaning	alone (4)/sisters (3)
7	inside	TV	sisters or family
5	under maple and sand pit	dirt play	sisters and friends (4) alone (1)
2	driveway	riding bicycle	alone (1)/sisters (1)
2	vegetable plot	gardening	alone (1)/father (1)
2	downstreet	walking to store	alone
2	downstreet	shopping	mother
2	grandmother's house	visiting	mother
1	driveway	baseball	alone
1	downstreet	circus	family
1	up hill	walking	girlfriend/neighbor
1	frog pond	playing with frog spit	alone

TABLE 9-5

JO'S LAND-USE (DIARY)

<u>Frequency</u>	<u>Place</u>	<u>Activity</u>	<u>Who With</u>
8	inside	TV	brother (5) Family (3)
6	inside	babysitting	brother (5) Peter and Nancy (1) (at Carrols')
4	inside	cleaning	alone (3)/brother (1)
3	outside	playing in sand or dirt	brother (2) brother and girlfriends (1)
3	driveway	cycling	brother (2)/Pam (1)
2	out of town	over-nights	Dot's (1) Grandmother's (1)
2	downstreet	shopping	Mom (1) sister and two adult friends (1)
1	out back	stomping in mud puddles	alone
1	a walk to Harold's	to check his dog	brother
1	inside	playing	brother
1	lake (Grandma and sister)	visiting	mother
1	inside	talking	alone
1	outside - lawn	talking	family and friends
1	downstreet	circus	Father and Mike
1	outside - Dot's	baseball and games	girl - neighbor
1	outside	cleaning yard	Father
1	inside at Grandma's	playing cards and checkers	Grandma
1	outside at Grandma's	cycling	girlfriend

house were similarly frequent, but for Jo there was the additional responsibility of babysitting, which never fell on Davy's shoulders during the diary week. Another frequent event for Jo, like her sister Annie, was overnight stays; they were so keen to do so that visits to grandmother's were subject to a strict weekly rotation system. As noted in the discussion of his spatial behavior, Davy was not yet comfortable with these stays away from home.

Because most of these children's place-use takes place on the land around their home, it is reasonable to speak of it as "land-use." In describing the details of their land-use, it is impossible to discuss each child separately, for, as reported above, Jo, Annie, and Davy shared so many of their activities. For this reason, I prepared a composite land-use map expressing all of those places which have an enduring function for the children (Map Figure 9-11). As a check upon this record, I casually asked Davy during my last week in the town (Summer 1974) if he would be willing to prepare a map for me of all the places he used and how he used them around the house. This quick sketch serves both as a reminder of Davy's great ability to map environments and when compared with map Figures 9-8 and 9-11 as a clear illustration of the endurance of Davy's place values and uses (Sketch Figure 9-12).

One of the most noteworthy features of these maps is that almost all of the space around the house is used by the children. This would be true for children everywhere if adults allowed it to be so, for they commonly have a radius of only a few hundred yards in which to define their play (see "Free Range" discussion, Chapter IV). As is commonly the case, very few of the frequently used places lie outside of the children's free range, because having to obtain permission to go somewhere reduces the spontaneity of decision-making which seems to characterize children's movements from one place to another (Chapter IV). The only outdoor areas around the house which have use restrictions placed upon them are the driveway, on which no structures may be built and where no equipment or toys are supposed to be left, and the garden after planting at the end of May. Occasionally, during my four years of informal visits, Mr. and Mrs. Robinson expressed dismay at the ravaged state of the heavily used lilac bushes and placed prohibitions on their use. These restrictions, however, have been ignored and the parents have come to realize that the lilacs grow back most successfully each year. The different proprietary attitudes of parents to the land around their homes seem to be a crucial factor influencing the extent of children's landscape modifications. Almost as many places were modified by these three Robinson children as by all of the children of the six families on Greenlawns Hill (see Chapter VII).

Easily the most popular play location was beneath the large maple in the front of the house. The overriding reasons given by the children for using this tree so often were the shade and the good dirt beneath it. The willow had also been heavily used before being destroyed in a July thunderstorm during my first summer with the family. Jo informed me that its qualities had made it a superb place for picnics, and for building forts, both in the summer and in the wintertime. Because these trees were not suitable for climbing, an apple tree at the eastern end of the mowing had been selected for this purpose. This tree was also valued for its apples. The children were all remarkably well-informed about the location and state of readiness of all the fruit-bearing bushes and trees within their range. Discovering a new edible resource or picking the first berry were among the most meritorious

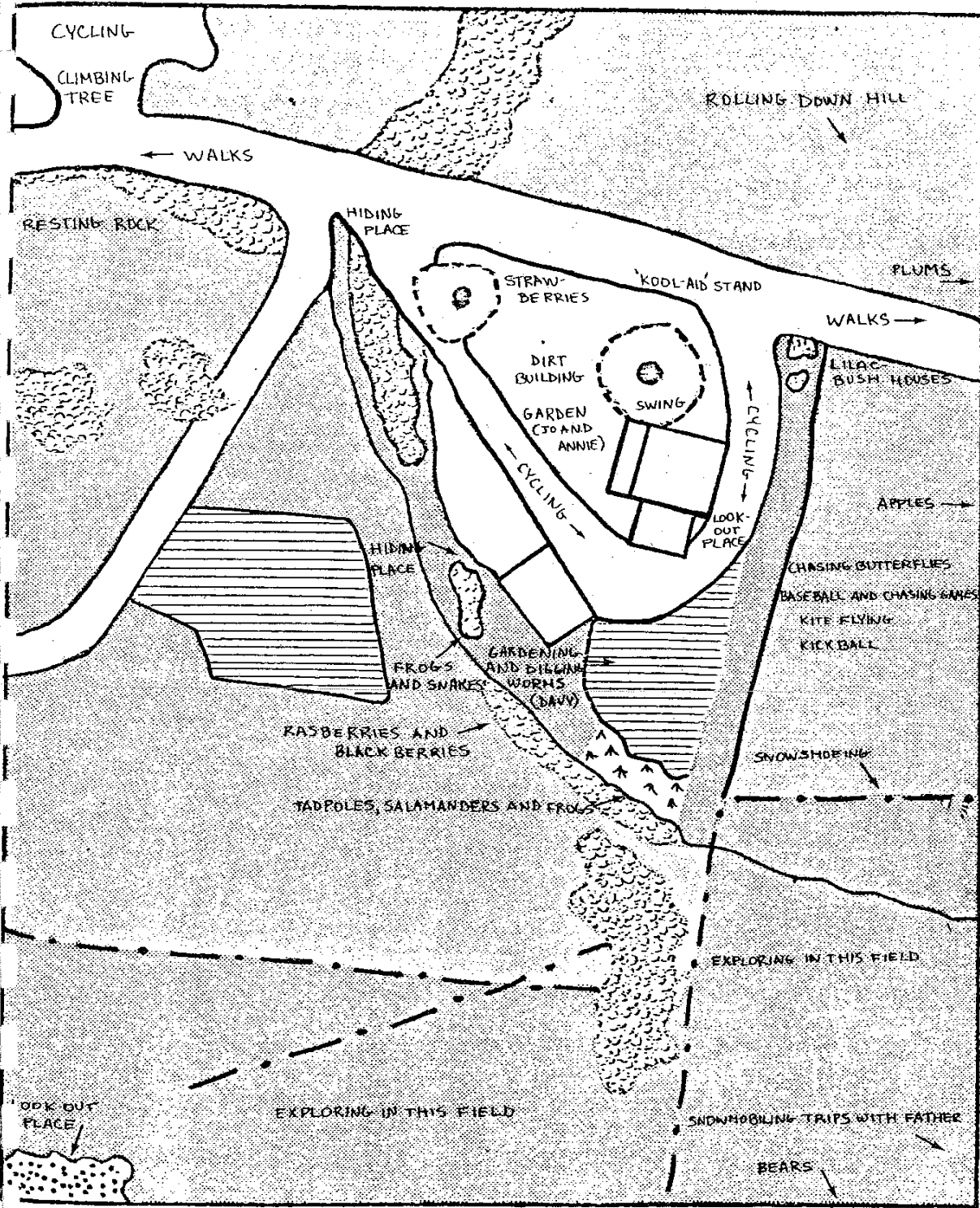


FIGURE 9-11: PLUM HILL FAMILY - LAND-USE

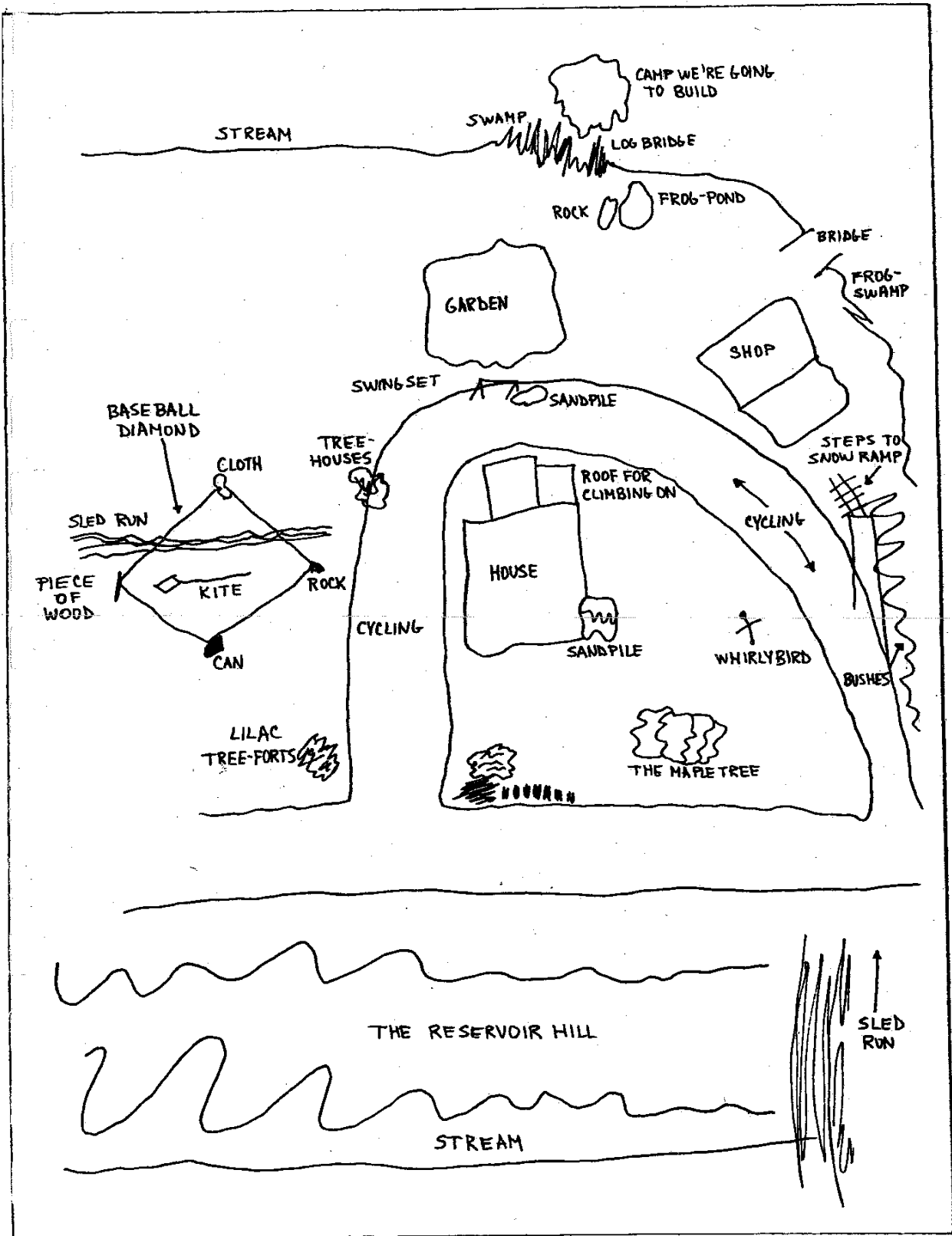


FIGURE 9-12: (Child's Sketch) DAVY'S PLACES (Summer, 1974)

of events within this small band's system of recognition. The knowledge of these resources, like that of certain other groups of children in the town, was most reminiscent of my brief observations of a shifting cultivator's intimate knowledge of naturally-growing trees and plants within his range of movements (1). The plum trees lay outside of the children's free range, and they closely guarded the secret from other children, not knowing that the "Maple Woods Development" children living on top of Plum Hill had been aware of the same trees for two years and had the same secretive attitude! Mention has already been made of the use of the lilac bushes for building "forts." A further value not only of bushes, but also of scrub and long grass, was for hiding. Each of the children had a number of "secret" hiding places which were used, they claimed, not only for the occasional hide-and-seek game, but also to get away from each other in order to spring a surprise or, sometimes, to be alone.

Second in frequency of use to the maple tree was the "frog pond" to the south of the garden. This is most heavily used by Davy, but Jo and Danny are also frequent visitors. It is a naturally low-lying area of the sluggish brook, but Davy occasionally guarantees his valuable resource by damming it with various pieces of wood and metal. The father's attitude to the pond is one of frustration. He would like to have it destroyed by re-routing the brook, for it spoils his garden, but he frequently speaks of what a loss that would then be to Davy, again demonstrating a level of awareness of children's place-use and its importance that was most unusual for a parent. The brook runs around the edge of the property and although other places along it are used, none of them are used as much as this still pond where Davy sits quietly for minutes at a time, hands cupped, waiting for a catch. He knows this pond so well that he has begun to fathom, and was proud to demonstrate, its ecology: "The frogs jump along through here," and "There's usually a salamander under this rock," etc. Similarly, certain sections of the brook are "known" to contain snakes and fish. All of this information is eagerly learned from Davy by his younger brother, Danny. Rarely a day goes by, except when the water is frozen over, that this pond or some section of the brook is not surveyed by Davy, often accompanied by Jo or Danny.

The "mowing" is considered by the children to be a superb place in the spring and early summer for baseball and kickball, but by July the grass which is grown by a local farmer for hay, is too long and the children have to play their severely-modified versions of ball games in the rear driveway (the raised front lawn is justly considered by the parents to be unsafe for such uses due to the danger of loose balls in combination with speeding motor vehicles).

The two large fields of tall grass and scrub to the south of the brook are places for exploring, but this is rarely done alone. Such visits are usually more in the form of an expedition. This is partly because they lie beyond the brook, and hence outside of the free range and may only be visited after asking permission each time. But the reticence to explore in this

1 These observations were made on the upper "gardens" of the valley of Mesopotamia on the island of St. Vincent in 1971 (see Wisner, 1972).

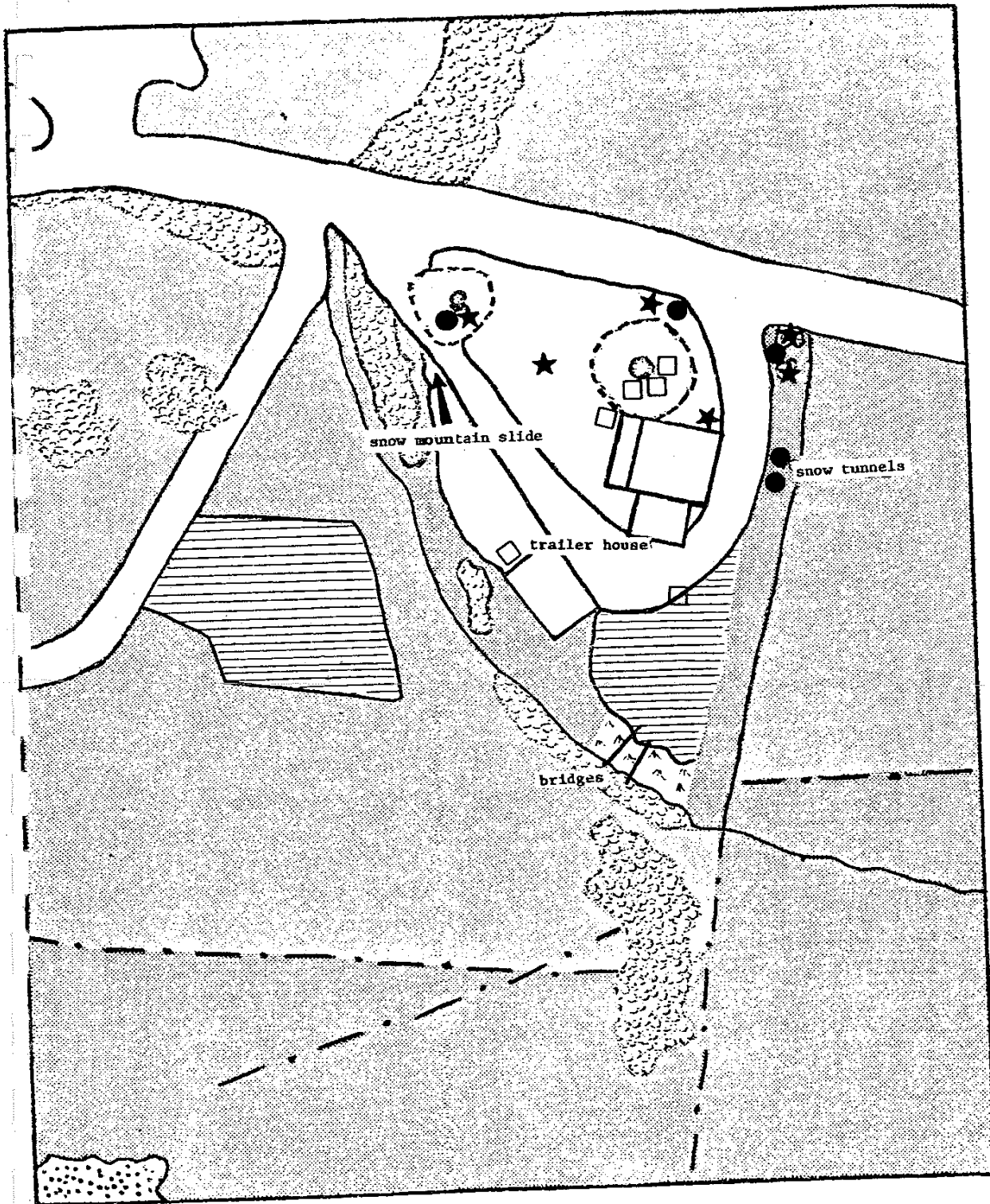


FIGURE 9-13: BUILDING ACTIVITIES (DURING ONE YEAR) - PLUM HILL FAMILY

- ★ Buildings
- Snow Buildings

direction also seems to be related to a fear of heading toward the woods, discussed at length in the previous section.

A few private possessions are carefully guarded in the children's bedrooms, but all outdoor equipment is shared by the children. Rarely did I observe even deference in the priority of use to the "real" owner; after a few weeks, a birthday or Christmas Tonka toy or baseball effectively becomes group property. This is true of many children in the town, but is particularly so with the Robinson children, I believe, because they so often play together that there is neither the fear of not being able to use a certain toy nor the need to hang onto it because of its barter value for gaining access into a play group (c.f. the West Main Street group of families, described above).

Landscape Modifications

The children's landscape modifications are expressed separately (Map ure 9-13) in order to highlight their relationship to the home and the surface features of the landscape. Easily the single most absorbing activity for the children of this family is play in dirt and sand. The most popular location is under the large maple tree. Here, the sparse grass area caused by the heavy shade of the tree has been worn down to a semi-circular area of dirt by the children's diggings, which reflects the moving daily pattern of shade beneath the maple's canopy. The activity usually begins with highway building but proceeds gradually to towns, fairgrounds, farms, racetracks, and circuses, sometimes in a continuous sequence of metamorphoses that last for days. This activity seems to particularly suit the children on hot sunny days, for it does not consume great amounts of energy. Although its heavy use proceeds in "runs," barely a dry day goes by without a couple of roads being scraped out of the dirt. All of the children play here alone, in pairs, and on one or more occasions I have observed all five of them building highways at once. To have observed Emily engaged in this "mapping" activity alone, and well before her third birthday, is excellent support for the "toy play" as mapping suggestions of Blaut and Stea (1971)(also Hart, 1976; Stea and Taphanel, 1974). In recognizing his children's great enjoyment of this activity and their keen awareness of suitably "good dirt" for building, Mr. Robinson made two attempts at providing sandpiles; in 1973 he built one by the porch and in 1974, he tipped another load of sand beside the vegetable garden. Both of these places are occasionally used by the two youngest children but they do not compete with the maple tree site which offers the dual advantage of both shade and a continuous view of passing vehicles. The environmental modelling or mapping-like qualities of this activity are best revealed in the children's own words. The following transcript is extracted from a sound film record of Davy and Danny made in the summer of 1975 (1). It reveals clearly how much of children's place learning results from their play and their exchanges with each other:

1 The filming was carried out with John Marshall of Documentary Educational Resources, Sommerville, Massachusetts (see Hart, 1976).

Davy : "My house is really big, it's a motel."
 Danny: "That's your garage."
 Davy : "Yeah. This is also up on the top, that's where you look out."
 Danny: "No, that's the chimney."
 Davy : "No-o-o-! (Pause) No, Danny. I just had that all nice. Now look what you did, grooves down through it (the road) and everything." (The road had just been perfectly resurfaced.)
 Danny: "What's the train station doing?" (Sound of hands patting down dirt.)
 Emily: "I'm going to make the turn Davy . . ."
 Davy : "Wow." (Sound of hands patting down dirt.)
 Emily: ". . . with my yellow car." (Hums to herself while patting.)
 Davy : "A-a-a-h!"
 Emily: (Continues to hum.)
 Dannie: "Hey, Emily, would you gimme a block?"
 Emily: "Yep."
 Danny: "This is Grandville's freight yard."
 Davy : "Grandville doesn't have a freight yard. Maybe Middleton."
 Danny: "Yeah, Middleton freight train."
 Davy : "I think Grandville does."
 Danny: "Yeah, a Grandville freight train, on the railroad."
 Davy : "Middleton has a big one. . . and that's part of Middleton (that Danny was building)."
 Danny: "No, this is Grandville."
 Davy : "Okay, you turn it around . . . now I'm gonna make a . . . (sigh) . . . oh darn, why do you have to be there? Come on, Danny."
 Danny: "Okay."
 Davy : "The train is going to have to come down through pretty soon."
 Danny: "Yup."
 Davy : "Or else up through. Should it go up through or down through?"
 Danny: "Up through. No, down through."
 Davy : "Should we make this steeper, or just so it goes on a slant?"
 Danny: "Uh."
 Davy : "Get the trucks down here. (Sound of children making truck-like noises.) That's the train. I said the trucks, get the trucks down here. Yeah, I get the dump truck, I take the dump truck down; take it right down the railroad. (Sound of children making truck-like noises.) These trucks, you press a button and they work for the railroad. (Truck noises.) Okay, put on your new wheels, your other wheels. I put on the brakes comin' down through here. (Truck noises.) Fill your trucks up Danny."
 Danny: "The train is goin' to come down, in twenty minutes."

Emily: "This too Davy?"
 Davy : "No."
 Emily: "Yes?"
 Davy : "No."
 Emily: "This?"
 Davy " "Yeah, bring that down. Who cares? I don't need it." (He mutters under his breath.)
 Emily: "Okay."
 Danny: "When it's just about goin' down hill, it's gonna break down."
 Davy : "How do you know?"
 Danny: "Cause, I know."
 Davy : "You built it that way?"
 Danny: "Yes."
 Davy : "You idiot, you idiot. No, it's not gonna."
 Danny: "This is the train that's gonna."
 Davy : "The train is comin' down."
 Emily: "This is another railroad."
 Davy : "No Emily, this isn't. This is not a road. You know what it is?"
 Emily: "A railroad."

None of the trees are suitable for "tree forts," complained Davy, but numerous "forts" and houses were built in the lilac bushes, in the old car trailer, with boards from the truck, and once with a giant cardboard box from a new refrigerator. Most of these were built by Jo and Annie, but Davy occasionally helps. Davy and Danny were more interested in dirt building. Danny and Emily often made very small houses for themselves inside the lounge of their home, out of chairs and any pieces of cloth they could find, I observed Emily do this many times alone, but more remarkable was how at two and a half and four years of age, respectively, Emily and Danny can co-operatively build such places for themselves. Probably because the available materials were not too easy to manipulate out of doors, I observed few instances of such tiny places there (see Map Figure 9-14 for Emily's and Danny's Land-Use Activities).

The locations of these places are not accidental. Neither are they entirely a function of the topographic site qualities. Many of them are directly related to the dynamic equilibrium the children maintain in their relationship to their home and to their desires to successfully engage with the world beyond. These factors even enter into the detailed question of their "house" and "fort" locations. During a discussion of snow houses between the two parents, I learned that Mrs. Robinson likes them built facing the house so that she can hear the children while they play. This has led to arguments with Mr. Robinson, who taught them to locate the entrances against the prevailing wind.

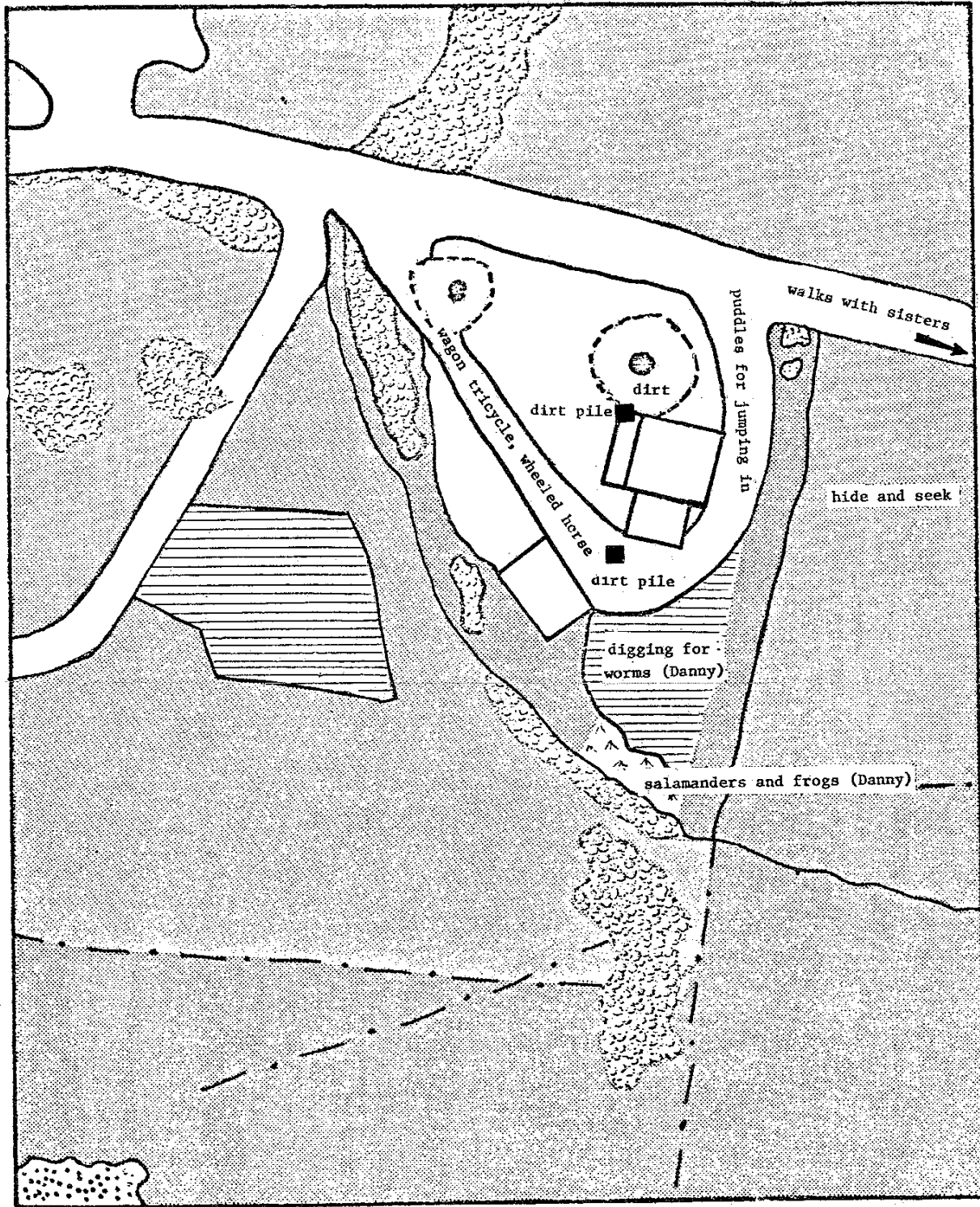


FIGURE 9-14: EMILY AND DANNY - LAND-USE

PART FOUR: Summary



PLATE XVIII

"Children's learning about themselves through their transactions with the environment arose frequently as an important theme of children's place experience." Existing conceptions of environmental education as the uni-directional learning of environments rather than the interactional learning about self and environment must change.

CHAPTER X. Summary and Reflections

This chapter has two parts. The first is a simple compact summary of findings following the four major headings adopted in the main body of this study. The second is a more discursive attempt to integrate some of the findings across these four traditional realms of inquiry and thereby move beyond them toward the formation of new questions, and directions for research.

Summary of Findings

Spatial Activity

Mothers were usually found to be the key figure in the dynamic set of forces which influence a child's spatial range in Inavale. While both parents commonly discuss these range rules, it is the mother who is left responsible for administering them. These parentally defined spatial ranges proved to be sufficiently reflective of children's actual ranges of movement to serve as valuable shortcuts for the aggregate comparison of children's spatial activity as it varies with children's age and sex. In considering these findings it should be remembered that grade level was commonly used by parents rather than age as the normative index of readiness to go places (such as the river), to use certain equipment (such as bikes), or hold certain responsibilities (such as mowing lawns). The major findings were:

1. Three types of successively larger parentally defined range were identified: "free range" (the area within which children may play without asking or telling the caretaker, usually the mother, each time); "range with permission;" and "range with other children." While these are called "parentally defined" ranges, they are in fact the product of repeated negotiations between a child and the primary caretaker of that child.
2. While no aggregate data was collected with kindergarten children, their contacts with each other and hence their parentally-defined ranges do grow rapidly during this first year of school. However, because the parents of kindergarten, as well as first- and second-grade level children, need to know where their children are at all times, their "free range" (i.e., without asking or telling a parent each time) is limited to an area where they can be seen and hailed at any time. The size and configuration of this area varies according to the visual access afforded by the topography immediately surrounding the home and the proximity of particularly dangerous features, such as roads or rivers.
3. The size of the free range of children of third-grade level is significantly larger than that of second-grade level children. The boys of the third-grade level are able to freely cross paved roads and ride their bicycles on the sidewalks and some of the roads. In contrast, the girls of this grade level are not allowed to travel beyond the immediate neighborhood of their home.

4. The size of the "free ranges" and "with permission" ranges of third-grade level girls and boys is significantly larger than it is for the second-grade children.

5. Boys entering the fifth-grade level have a markedly larger range than those of fourth-grade level and many of these ten-year-olds no longer have any spatial restrictions on their movements. Girls of this age are still commonly expected to be available around the house to assist the mother, particularly in the care of younger children.

6. Boys' ranges "with permission" are not comparatively larger in the sixth grade than in the fourth grade because by fifth grade (10 years of age) the boys had gained freedom to travel almost wherever they please and so their own powers of locomotion had already set a limit. In contrast, the girls showed a significant increase in the size of their "with permission" range but this is explained largely in terms of permission to "run errands" to particular places.

7. The fears parents have for their children which influence the setting of range restrictions change in nature according to the age of a child. With the younger children (i.e., under eight years) the fears are largely related to physical elements. In Inavale these are most notably traffic on the major highways and steep hill roads; the river and the brook. As children begin to move away from the home at eight or nine years of age, the parents express fear that their children will come under the "bad influence" of certain other "loose" children. Finally, with the older elementary school-children and teenagers, especially the girls, the parents fear the influence of "outsiders" upon the town. This includes immigrants - residents coming from outside of the State - but is mainly related to the many tourists passing through the town, who, the parents believe, bring to the town's children, drugs, loose morals and generally "getting into trouble" downstreet.

8. The distinctly suburban-style housing area in the town with its green lawns and quiet side road offers the parents excellent visual and auditory access to their children playing out of doors and so enables the latter to have a relatively large "free range" compared to the children of the dense and relatively noisy town center residential area.

9. While children of fifth- and sixth-grades, especially boys, are liberated spatially, there remains a "checking-in" system for maintaining contact between the primary caretaker and child. Because I did not recognize this early in the study, neither parents nor children were asked specifically about the length of time the children could stay away from home without reporting back. There is commonly a periodicity to children's "checking-in" with their mother. This ranges from the very subtle glances and smiles of recognition between mothers and young children to the very explicit telephone call reports of fifth- and sixth-grade boys. Any future detailed comparative study of this subject would have to consider this temporal dimension to children's range restrictions and would need to rely for much of the investigation upon the kinds of detailed ethological observations of mother and child which have already been made by Bowlby with infants (Bowlby, 1968).

10. Boys' parentally defined ranges are significantly larger on all three classes of data than the equivalent ranges of their girl peers. This divergence in the size of spatial range increases as the children become older. Other recent studies in different cultures and sub-cultures have made similar observations (reviewed in Saegert and Hart, 1978). Related to these differences, girls are expected to help their mothers by doing work around the home, particularly caring for younger children, while boys' work, such as the paper routes, running errands and mowing lawns, more frequently carries them away from the home.

11. Boys reveal considerably more ambiguity over their descriptions of parental range limits than the girls because their mothers more readily "turn a blind eye" to the breaking of range restrictions. This is related to what they consider to be the natural inclination of "boys to be boys." Nevertheless, should the boys get into trouble outside of the range defined by the parents, such as falling into a river, they are firmly punished, usually by "grounding."

12. Cycling range lags behind the extent of the children's pedestrian range. Even fifth- and sixth-grade level boys are rarely allowed to cycle on the busiest highway in the town. Girls are again more restricted than boys and many of them do not even have a bicycle. The parents' attitudes conform directly with a comprehensive research program by the Swedish Government which concludes that not until ten years of age can children engage with traffic on the roads as competently as adults (Sandels, 1974).

13. Those parents native to the town commonly hold a tighter rein on their children's range away from the home and their contacts with other children than do the parents of immigrant families. The mothers of native families frequently revealed the most likely explanation for these relatively tight restrictions during informal conversations. They fear losing their children to what they see as a lack of discipline and a social permissiveness in the child-rearing practices of many of the immigrant families. Future comparative ecological research should reveal whether the avoidance of certain types of children is a common factor influencing parents' range restrictions.

14. Within-family differences related to birth order were noted in children's spatial ranges, though the small sample prevented any statistical comparisons. Informal explanations were again initially suggested by some of the mothers during conversations. The first-born child seems to be held closer to the mother through childhood because the mother has not yet learned what is safe or unsafe in her negotiations with her child. There also seems to be a tendency for mothers to hold the last, or only, child closer to the home because she jealously desires to hang on to her or him.

15. Much of the children's path network is independent of the adult routes in the town. Some parts of this network pass directly through private properties that adults would not dare to trespass upon.

16. Routes described by children as "short-cuts" are valued by children even when they are more truly long-cuts. The primary value of a large number

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16. Routes described by children as "short-cuts" are valued by children even when they are more truly long-cuts. The primary value of a large number

of children's paths, unlike the majority of adult routes, is not for getting from Place A to Place B; the journey itself is frequently the purpose of a trip. This is an extremely important point for the environmental planners of new residential areas to note. It is just one illustration for them that children use the whole environment.

17. A larger proportion of girls' trips away from their homes are "social" (i.e., to other people's homes) in nature than are those of boys. Similarly, the girls included a much larger proportion of "social" elements in their landscape models than did the boys.

18. Very few adults are visited by the children. Similarly, in comparison to other children's homes, very few houses or work places of adults are identified as valued places. Those few adults who are important to the children of Inavale may be grouped under two categories. First are those adults who allow children to observe them in their work. This category includes garage mechanics, firemen, the town truck drivers and machine operators, and one or two of the women who manage the fancy goods stores in the commercial section of town. The second group of important adults are certain elderly people who are willing to talk with the children. The importance of these two groups of people was made clear by both the records of children's visits and the models they built of the town.

Place Knowledge

1. There is a high level of significance in the relationship between a child's age (i.e., grade level) and the level of spatial organization of their landscape models (maps).

2. Boys' landscape models (maps) are significantly better in spatial organization than those of the girls.

3. After breaking down each child's landscape model (map) into clusters of places that are relatively well-organized, the highest level of organization, on the average, is found in the cluster which each child built immediately around her or his own home; the second and subsequent clusters reveal a successive decrease in level of spatial organization.

4. Even "pre-school" and kindergarten-aged children (aged four and five years) produced "home clusters" that are map-like. Eight of the 12 children of this age produced landscape models in which the elements around the home are "positionally" organized (i.e., the relative positions of the elements are correct, though the angles and distances between these elements may not be accurate in comparison to the veridical map of the town).

5. Each of the children's three spatial ranges of movement ("free range," "with permission" range, and "with others" range) is significantly related to the level of spatial organization of the landscape models. A higher level of significance was found between the level of spatial organization and the two larger categories of spatial range than with the "free range."

6. Children younger than eight years of age cannot (with rare exceptions) readily incorporate the school bus journey into their landscape models (maps). The school is usually placed arbitrarily at the end of a short section of a road which begins wherever that child catches the school bus. The same problem occurs with journeys made in the children's parents' cars, confirming Lee's hypothesis (following Piaget) that such young children need to move through an environment under their own locomotion before they can mentally represent spatial relationships in it; passive experience from a moving vehicle is no substitute for this kind of learning.

7. Children's spatial range of movement "with permission" was the variable found to be the one most significantly related to the spatial extent of the environment represented in the children's landscape models.

8. Children's age is significantly related to the spatial extent of the children's landscape models.

9. The girls' landscape models are not significantly smaller in the extent of elements modelled, even though these models are less well-organized.

10. Children are able to recognize and identify many more places than they showed in their landscape models. This is a reflection of a large gap between a child's knowledge of a place and his or her ability to mentally assimilate such knowledge into an overall representation of how these places are spatially interrelated.

11. Children reveal an ability to construct or describe the spatial relationships of elements in certain oft-frequented small areas at great distances from their home area, separated by "no-places," experienced passively in moving vehicles. Because they are unable to relate spatially these areas to their home area, they did not usually attempt to include them in their landscape models.

12. Children reveal a remarkable ability to recall in great detail the physical qualities (particularly color) of places within their everyday environment for which they have no place name or other association.

Place Values and Feelings

Place Preferences:

1. In investigating place preferences, children select very different types of places when interviewed in a traditional manner than those selected when they are given the opportunity to lead an investigator to those places. In particular, children identify many more small places valued for particular uses on the "place expeditions" than during the interviews.

2. Relatively more of the younger children's (K to third-grade) place preferences are of the "commercial" or "social" (people's homes) category, while older children (fourth- to sixth grade) valued more places for their "land-use," and in a few cases, for their "aesthetic" qualities.

3. Although rivers and lakes are the most highly valued places, the rivers are forbidden for children to use until at least eight years of age, and the lakes lie beyond the spatial range of all but the oldest boys.
4. Brooks and small "frog ponds" are highly valued places, used for dabbling in as well as for watching and catching wildlife.
5. The woods are extremely high on most children's sets of preferred places even though they are often feared by the same children.
6. In addition to trees, such dangerous and forbidden places as sand-piles and quarries are highly valued for their suitability for climbing and jumping.
7. Hiding places and lookout places are two environmental qualities valued by children, which are not readily revealed by the kinds of observational survey reports which concerned environmental planners use as guides in their attempts to plan with children in mind.
8. Girls selected many more places inside their homes than did the boys. These were usually their own bedrooms. Since this study made no attempt to investigate children's use of the inside of their homes, no confident explanation is offered for this interesting revelation. It is one indication of the need for future studies to consider children's use of the indoor as well as the outdoor environment.
9. More boys stated that they valued their fathers' work places than did girls select either their mothers' or their fathers' work places.
10. Very few children described their place preferences in terms of aesthetic qualities. Most of those who did were older children who described the visual aesthetic qualities of a view or of a building in a similar manner to adults' common exclamations on beauty in our culture.

Place Fears

Children's consensual place fears resemble the seemingly archtypical scary places of children's literature: abandoned buildings, woods, attics, cellars and bedrooms and garages at night. They are probably passed on to us as part of our place mythology but all share some common features which are understandably fear-provoking: they are uninhabited and dark, offering unlimited opportunities for imagination. These same abandoned buildings and woods were also described by many of the same children as favorite places.

Place-Use

1. During the spring, summer and fall children prefer to play at the front or at the sides of houses rather than to the rear. This enables them to see what other people are doing and enables them to be seen so as to attract other children to their play. In the winter, there is much less outdoor play. It commonly takes place on the hill slopes or large spaces located

behind the children's homes.

2. As the children grow older they find their play places successively farther away from the home. The only exception to the decrease in the use of places in the home environment with increasing age is the use of fields and lawns for organized games. The town center ballfield is too far away and, except for the formal Little League practices and games, it is used only by those children who live around it. Such organized games are only played in those parts of the town where there is a critical mass (at least four) of older children (over 8 years) in free contact with each other and where there is a suitable field nearby.

3. Most of the cycling activity involves the older boys. Because of the parents' restrictions, paved areas in the town such as car parks and driveways are heavily used by the younger children.

4. Older boys spend a lot of time during vacations and weekends just "cycling around town," in order to find out what to do; such freedom is extremely rare among the girls.

5. Children spend a lot of time alone quietly resting, watching or dabbling in sand or water. Such activities have been given little recognition in those reports of children's play prepared for environmental planners.

6. Children spend a large amount of time building places for themselves.

7. Many of the self-built "houses" of children under eight years of age are simply found places with scarcely any physical modification. They nevertheless serve as "houses" and "forts" to the children and the interiors are highly differentiated and modified by the imagination.

8. Child-built places are largely located within 100 yards of the children's homes.

9. The primary factor required to allow these important building activities to occur is the availability of areas close to the home not dominated by adults either by verbal restrictions or by the kind of physical manicuring of the landscape which announces ownership by adults. The second quality, rarely a problem in Inavale, is that there be flexible landscape elements and loose parts for building. The lush vegetation of Inavale and the snow in the winter are ideal. Future comparative research should reveal to us how much variation there is in children's opportunities to modify the environment in urban and suburban areas.

10. Girls' building activities are very different from those of boys. Whereas boys concentrate upon the structure of the buildings, the girls' emphasis is almost entirely upon interior detail, which is often imaginatively modified. Explanation is offered in terms of the different role expectations of girls and boys.

11. Small patches of dirt throughout the town are the most intensively used of all children's places. Boys commonly build large-scale places such as highway systems and towers, whereas girls, unless playing with boys,

usually build single houses and elaborate the interiors. The same explanation is offered as for Number 10, above.

Some Reflections on the Research Findings

At the outset of this investigation, I held numerous hypotheses concerning the development of children's experience of place. Because these hypotheses had been drawn from a miscellany of sources: biographies, discussion with family friends, colleagues, and numerous very specific realms of child-environment theory and research, I had little faith that they were in any way central hypotheses. I therefore decided to design a holistic field study that would be likely to generate new hypotheses as well as place my existing hypotheses in a more comprehensive context. Having completed this investigation, it is now possible to discuss some of the old, new and newly integrated hypotheses in terms of the extent to which they have been verified and/or reformulated. An attempt is also made to consider the implication of the findings for the practices of environmental planning and design for children and for the education of children.

Children's Exploration of the Environment

Figure 10-1 summarizes the major forces identified in this study which combine to operate upon Inavale children's exploration of the environment. It is difficult to express these forces diagrammatically because they are usually transactional rather than uni-directional. For example, highways may act as a barrier not only because of parental restrictions but also because of children's own fears of the sheer physical impossibility of crossing busy lines of traffic. For this reason Figure 10-1 should be read with the text and the arrows should be read as expressions of the predominant direction of a force only.

The primary force lies within each child in the form of a desire to explore and come to know the larger environment. This much was assumed at the start of the investigation (see discussion of "Exploratory Behavior" in Appendix A-1). It has been empirically confirmed in this investigation. Froebel, long ago, offered a most embracing explanation of this urge (Froebel, 1826). He believed that children had a desire to comprehend the extent and diversity of the world in order to better comprehend their own place within it. He then went on to express pantheistically, the harmony and unity of the natural world and a child's desire to grasp this unity in order to develop a sense of inner unity. It is probably because of his inferences to God (by which he meant the unity of life) that he has been forgotten in recent decades. But such large questions are important. It is not enough for us to only ask like Piaget "how does a child conceive of the moon?" we must also ask why children ask questions about the moon, and what importance this information holds for them. The motivational side of genetic epistemology has been sorely neglected.

Operating as a deterrent to children's explorations of their environment are their fears for certain kinds of places. A certain degree of fear of the unknown is perhaps a component of much of children's experience of new

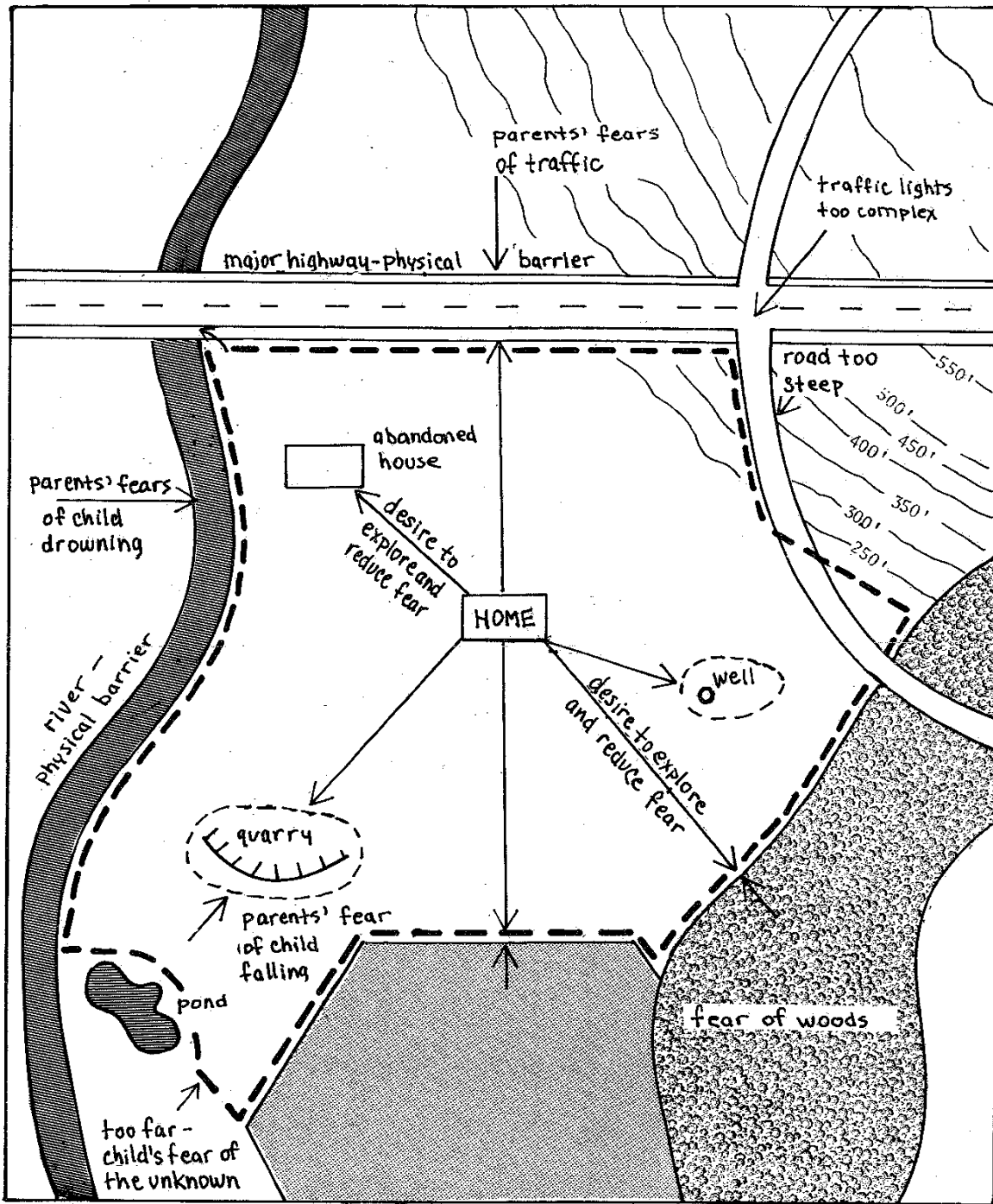


FIGURE 10-1: COMMON FORCES INFLUENCING CHILDREN'S SPATIAL BEHAVIOR

--- LIMIT OF "FREE RANGE" OF HYPOTHETICAL 8-YEAR OLD.

places; psychologists have observed how infants in strange (unfamiliar) environments will explore the environment more when the secure face of their mother is present than when she is not (Appendix A-1). In the geographic-scale environment, the home is the secure base from which children explore (1). From this base, children gradually extend their range of familiarity with the environment. As they do so, children are repelled from some places more than others because of fears they associate with them. Some of these fears are unique to a child, based on some personal experience, such as an inexplicable noise they once heard coming from a certain building. Others are more generalizable. In Inavale, the more generalizable fears were woods, abandoned buildings, and various places at night or in the dark, such as a tree, or the cemetery, etc. A most interesting feature of children's relationship to these places is that while they express fear of them they also commonly express an attraction to them. This may be related to the more general suggestion that knowledge has not only a growing-forward function but also an anxiety-reducing function, a protective, homeostatic function. This conforms with the more general notion suggested above that children have an urge to know the physical world in order to feel comfortable in it. Of the so-called "unrealistic fears" (2), woods were the only category of place which had a marked influence on the extent and configurations of children's ranges. In this study, only the most exploratory of the children (fifth- and sixth-grade level boys) ventured deeper than the fringes of the woods or more than a few yards from the well-known paths which transect them.

Parents' fears of places for their children also operate as deterrents to children's explorations of environment. Fears of rivers, lakes, busy highways, minor roads with steep hills, quarries, and wells, were identified by parents. Many mothers saw the need for their children to gradually come to understand the dangers these places held so that the children could manage their own activities more. The willingness and the knowledge of when to refrain from intervening in children's learning to deal with dangers also involves learning for the parent caretaker (usually the mother). Because of this learning, mothers seem to become more liberal in the exercise of range rules with their second and subsequent children than with their first-born child.

There were occasionally social fears which repelled a child away from a place, such as another child wanting to fight or a group of children who might make fun of him or her. However, these were temporary fears in Inavale; there did not seem to be any places that were avoided by the children because of enduring fears of certain people associated with those particular places. Parents however have "social" fears for their children, which lead to restrictions that are less subject than their fears of physical-environmental dangers to gradual erosion through experience and learning. Fears such as "bad influences" on their children are, for Inavale mothers, usually a mixture of

1 There are often frontiers of fear within the home, notably the cellars, as reported in Chapter VI, but, overall, the home seems to represent a secure and safe base to the children of this study.

2 Jersild distinguished "unrealistic fears" such as haunted houses from "realistic fears" such as traffic (Jersild, 1935).

the influences of drugs, petty crime, bad language, and sexual permissiveness, and are associated by many parents, particularly those native to the town, with "downstreet" where many "outsiders" pass through and "hang-out."

All of these forces operate in different degrees and combine to create very different geographical ranges of experience in children. In this investigation, systematic comparisons were made in terms of age and sex only, but differences in the physical surroundings of children's homes were also a major factor influencing their ability to extend their horizons. If there can be such a variation in children's ranges due to the physical and social environment of a town like Inavale, it is not difficult to imagine how dramatic the constraints on children's movements might be in the center of some cities where some of the environmental factors described above are so much more severe. Comparative ecological research on pre-adolescent children's access to the out-of-doors in cities remains to be carried out.

It is crucial to think of children's spatial ranges as the product of negotiation between parent and child, not as the expression of a child's desires only, or as an expression of a parent's total domination although in some rare cases (there were none in Inavale) both of these extremes undoubtedly occur. The failure to recognize the interactive nature of child-parent (or caretaker) relations has already occurred in numerous housing guidelines and critiques by planners and architects. These professionals write of the need for mothers to be able to watch over their children, as though children feel no needs to also maintain contact with a caring adult. This is but one example of why purely observational research is no substitute for the kind of eclectic methodology propounded and demonstrated here.

A most interesting example of the effects of environment upon spatial behavior in Inavale concerned the differences between children living in a suburban-like setting and those living in the built-up, busier and more physically diverse Main Street environment. While recognizing the danger of generalizing from a single comparison, there are some interesting suggestions to be made. Modern suburban housing tracts with spacious, uncluttered landscapes, when compared to more urban environments, offer better visual and auditory access between parent and child, and reduced perceived dangers of traffic, crime and socially bad influences (suburban settings are more socially homogeneous). As a result, young children are given more spatial freedom in suburban settings. However, because of the very same reasons that the environment is considered safe, the children do not learn to negotiate different kinds of environments well nor do they learn to deal with environmental hazards; one could say that they have limited opportunities for developing their environmental competence. Their spatial range is not gradually expanded through their own explorations in consultation with parent(s). Instead, it is provided by adults through a safer environment. This is just one way in which suburban children are denied opportunities to develop as resourceful, environmentally competent individuals. Others involve the over-provision of highly prescriptive toys and play equipment in contrast to the loose parts environments and equipment of rural and many city children; a greater dependence upon the motor cars of adults for getting from place to place; and a daily schedule which is defined much more by adults. These suggested differences need to be brought into sharper focus in order to develop a new debate with parents in North America and Western Europe on what the real advantages and disad-

vantages of suburbs have been for children since the great promises of early suburban proponents in the 1940's (1).

Children's Knowledge of the Environment

The Importance of Environmental Knowing

It was assumed at the beginning of this investigation that children have an urge to explore and to come to know the environment for its own sake, independent of any specific needs. Surprisingly, while there has been much investigation of the development of children's ability to represent the spatial properties of the environment, most notably by Piaget and his collaborators, basic motivational questions have not been asked. We have learned much about the how but little about the why of children's environmental knowing.

There may be a basic urge for each of us to surround ourselves with a known, and hence, safe space to which we can retreat in times of danger or difficulty. This is one of the theories of exploratory behavior and topographic learning in animals which may have some relevance to human development. Dozens of studies of cognitive mapping in human populations have been carried out over the past decade but with the marked exception of Lynch's The Image of the City (1960), these studies do not ask why people have "cognitive maps" (i.e., spatial representation ability). Lynch's book carries as a major implicit thread the belief that people have a fear of being lost. This is stated by Lynch in explicit but milder form as a distaste for disorientation.

Orientation to the environment however, can only offer a partial explanation. Why would a child choose to venture out of what Rand (following Eliade, 1959) went so far as to call the "sacred" space into the "profane" world beyond (Rand, 1969). I believe, following Froebel, that understanding the extent and diversity of the world is an important part of any child's developing conception of his or her own existence in the universe (Froebel, 1826).

The large amount of time spent by children deeply involved in modelling the environment in micro-scale is one demonstration of their desire to give order and meaning to the larger environment which lies beyond their physical grasp. The modelling play also reveals a great interest in what happens in different places and what the children themselves would like to do in them. Learning about what happens in different environments and about

1 Reference is made here only to suburban settings because there was no environment in Inavale similar to that of a city. I recognize that city children often have limited opportunity for engaging with the environment because they are so severely restricted in their range of free movement. However, the suburban environment is all too often assumed to be the ideal environment for children whereas the cities are too readily considered to be the most difficult places for rearing them. Currently, comparative research is being carried out by Cecilia Perez and myself on children's access to the environment in New York City.

one's self in relation to the environment are at least as important a product of this micro-modelling as learning about the spatial properties of environments. Children's learning of functions and processes in the environment were not considered in this report, but children's learning about themselves through their transactions with the environment arose frequently as an important theme of children's place experience. Existing conceptions of environmental learning and environmental education as the uni-directional learning of environments rather than the interactional learning about self and environment must change. Some beginning stabs at this issue are made here after first considering some more familiar aspects of environmental cognition research.

Representing the Large-Scale Environment

In our review of children's spatial representation of the geographic-scale environment, Gary Moore and I laid considerable emphasis upon children's intellectual development, drawing particularly from the theory and research of Jean Piaget (Hart and Moore, 1971, and Appendix A-2). We concluded that the development of children's systems of reference proceeds through three stages: egocentric, fixed, and coordinated, the last stage being achieved in children with the equilibration of concrete operations. Also, though much of the evidence was anecdotal, the suggestion was that "route-mapping" developmentally precedes "survey-mapping". These suggestions have been born out in this study. However, it is now clear to me that our emphasis upon the development of children's logical powers inferred a largely universalist age-related developmental account of macro-spatial cognition in children. There was little consideration of the role played by children's particular experiences with the large-scale environment. Our reverence for Piaget's writings was not tempered by any empirical knowledge of children's activities at that time, and so we haughtily extracted Piaget's lighthearted critical statement of what the development of children's topographical representations would be like if spatial cognition were simply a matter of cumulative experience:

At four years of age a child is brought to school by his (sic) mother, and is therefore only aware of the school, his home, and the local candy store; at seven, he knows a few roads, and can therefore describe fragmentary routes; and at nine or ten, he is allowed to roam free and consequently knows the topography intimately. (Hart and Moore, 1971, summarized from Piaget, et al., 1960, p. 24)

In fact, this is a reasonably good description of the development of children's knowledge of Inavale.

Piaget emphasized that the growth of place knowledge, like all knowledge, is not a matter of mere accumulation:

. . . while it is true that between the ages of four and ten, children collect a good deal of

information about their district, they also coordinate the picture which they have of it, which is an infinitely more complex process of development. (Piaget, et al., 1960, p. 24)

While coordinating one's information about place is important, this investigation has revealed that this is of little importance if there has been little opportunity to experience the environment. Consequently, different degrees of parental restriction is just as important a variable as age in influencing the quality and the extent of children's knowledge of the large-scale environment.

Naming the Environment: The Genesis of Place

The landscape is differentiated by each of us into a multitude of places. Many of these carry names which have been handed to us by others and, in fact, these places and objects carry meaning for each of us because we were given a name for them which we could then use to differentiate the place or object from the totally perceived environment. Through this process we each come to live in an inter-subjective landscape where there is a consensuality over what parts of the total environment are places and objects and what meaning these places and objects have. But this landscape of common language is not the total "subjective landscape". This is dramatically revealed when we discover how a child names his or her landscape. The landscape is commonly personal, that is, with very few place names that are shared with other children or adults. These place names are often directly descriptive or functional such as "the house with the dog that barks" or "the sliding hill", and invariably they are tied to that child's own uses of and experiences with the landscape. Nevertheless, children in their play often teach each other these personal place names, and parts of their landscapes become shared in meaning. A child's degree of differentiation is remarkable; simple backyards described by their adult owners as "lawn", "vegetable plot", "apple tree" and "ditch" will commonly have dozens of highly minute niches for different activities. These places are a part of child-culture which is not shared with adults unless the adults make a special effort. They have barely been studied, although certain adult writers such as A. A. Milne have tapped them as excellent sources for children's literature.

The identification of places feared by children again reveals the existence of a child-culture relatively independent from adult uses and meanings. While I found in Inavale a large number of places that were uniquely feared by individual children, certain places and categories of places were held in common by many children as places to be feared. They resemble the seemingly archtypical scary places of children's literature as revealed for example in the writings of Mark Twain: abandoned buildings, woods, attics, cellars, bedrooms and garages at night. They are probably passed on to children by each other and by literature and films which deal with place mythology, as well as by some common features of these places which are understandably fear-provoking. The need for environmental planners to recognize that there is a culture of childhood with its own landscape distinctions is taken up at the close of this review.

Beyond the Experienced Horizon

Children did not seem to have much knowledge of, or interest in, the world beyond that which had been directly experienced by them. Any places lying beyond the relatively well-known four towns to the east, west, north and south of Inavale lay "out there", for any child of third grade and younger. The relative distance and direction of such places was unknown and seemed irrelevant to them. Any information they may have gathered from maps and atlases in their school had clearly not been related to their knowledge of the spatial relations of the home environment at all. This is typical of elementary school geography and it is no wonder that children and teachers alike find geography lessons frustrating. Even though it is often written in educational texts that mapping and environmental studies must begin with the children's home environment, teachers still rarely follow through on this suggestion. If children have such a poor conception of the relationship of their own environment to the world beyond it, they may also be less likely to show interest in the kinds of distant places discussed in social studies, history, and reading in general.

Knowing Self through Environment: Some Implications for Education

The Role of Environmental Manipulation in the Development of Competence

Environmental competence as used here means the knowledge, skill and confidence to use the environment to carry out one's own goals and to enrich one's experience. Throughout this investigation it has been noted how important the physical environment is to children's developing conceptions of their effectiveness. The successive developments of grasping, moving through, and modifying the environment bring most noticeable satisfaction to a child. In this study, it has been shown how children of different ages and abilities search out new and more complicated routes of travel; set themselves more and more sophisticated building tasks; and experiment with innovative uses of found materials outside of any particular needs. Erik Erickson (1963) has suggested that a small, safe, manageable world of toys, which he termed the "microsphere", was important for children before they venture out into the more complexly interacting social world. I would agree but must add that children continue to exhibit a strong desire to manipulate the physical environment throughout childhood; environmental competence must be an important dimension of a child's development, and probably of human development throughout the life-span. The only notable break I found was at 12 years of age when the children enter High School. At this age most of the children retreat from expressing interest in their modelling and imaginative transformations of the environment. Paul Shepard's suggestion may be relevant. He argues that children of this age have grasped much of the diversity of the physical world and their own relationship to it and are now needing to develop a more sophisticated understanding of the social world (Shepard, 1973).

Because there are significant variations in children's opportunities to explore and manipulate the environment, one should expect their environmental competence as adults to vary also. The overriding force influencing



PLATE XIX

"Environmental competence as used here means the knowledge, skill and confidence to use the environment to carry out one's own goals and to enrich one's experience."

variation in these opportunities is the parents, through their direct restrictions or encouragements. Whether relatively conscious or unconscious, the parents appear to use physical objects as "tools" in the preparation of their children for particular roles in society: the environment is used as an instrument of socialization.

The Environment as an Instrument of Socialization

It has already been noted in this discussion that parents have considerable influence over their children's opportunities to explore the environment. In addition, parents were observed to exercise, in varying degrees, control over the specific types of places children use and how they are used. I was able to distinguish two criteria which have a bearing on the kind of environmental socialization any particular child was likely to receive. First is the child's sex: girls and boys are treated very differently. Second is the parents' occupations: the children of parents who are manual workers are encouraged toward different environmental engagements than the children of non-manual working parents.

The Role of Environment in the Socialization of Girls and Boys

Girls are constrained in their movements and in the nature of their manipulation of the environment. It seems that girls are practicing and being prepared for roles in the home and boys for roles outside the home. One problem faced by girls in the development of environmental competence has to do with a sense that the activities and skills involved are for boys only. Generally, children have been found to perform better and prefer to spend more time on tasks and in play labelled as appropriate for their own sex. In assessing the relative abilities of females and males, this problem makes any inference of the presence or absence of an internalized trait extremely difficult. Furthermore, because the quality of the lives of girls and boys is often drastically different in so many ways, any simple relationship between freedom to explore and manipulate the environment and spatial abilities runs the risk of greatly oversimplifying what is probably the true situation. In a paper on this subject with Susan Saegert we have noted that while there does seem to be a genetic base for the development of spatial abilities, this base is relatively less developed into adult skills in girls than it is in boys (Saegert and Hart, 1978). In summary, girls in the town are commonly not encouraged to see environmental competence as appropriate to their sex. We suggest that these very different opportunities given to girls versus boys to freely explore and manipulate the environment effects their ability to mentally represent it.

We have seen that girls tend to be restrained by parents, teachers, and peers in their environmental exploration and manipulation because such activities are commonly considered masculine. Thus, not only is a possible area of competence and adventure denied them, but the attendant restrictions could be expected to undermine their self-confidence in these areas. Both lack of experience and lack of confidence would, in turn, tend to diminish girls' spatial abilities and perhaps generalize to other types of problem solving. Certainly, the stereotypes and their related restrictions do not

support the development of skill in using the environment for attaining one's goals.

The Influence of Parents' Work and Income Level on the Socialization of Children through the Environment

Transcending the differential treatment of girls and boys, I found some marked differences in the kinds of environmental experiences encouraged by the parents of different families. It is difficult to identify factors which might explain these family differences, but one particularly evident distinction is between those families in which the parents are manual workers, and those in which the parents are non-manual professional persons. This occupational distinction seems to be particularly important with respect to fathers. The mothers are observed by all of the children in their traditional domestic housework, even though they may hold an additional job outside of the home. In this town, manual working fathers are commonly observed by their children going about their work, thereby offering valuable opportunities for the children to learn about the use of materials through observation. In addition, these fathers were observed to directly encourage resourcefulness in their children's use of materials. This observation is of course confounded by the fact that these fathers also commonly earn lower incomes resulting in fewer acquisitions of toys and play equipment, thereby making resourcefulness more desirable. But the disparities seemed greater than could be explained by income alone. This is especially true of the kinds of things children are bought. The middle-income non-manual working parents commonly limit their frequent purchases to toys, games and motorized vehicles. The purposes of these materials is clearly prescribed in their design. If they break or malfunction, the children are not expected to repair them. Similarly, the parents' play with their children is limited to play with organized games and electrical equipment. In contrast, when the manual-working parents, most commonly natives of the town, buy for their children, particularly their boys, they buy tools and such functional equipment as pulling-type wagons and fishing rods, with which their children manipulate their environment. Their interactions with their children commonly includes building and hunting. These different purchases and experiences with the father differentially discourage or encourage resourcefulness in the use of materials.

In addition, the manual-working families seemed to directly encourage greater freedom in their children's explorations of the environment. The freedom to explore is another opportunity for children to learn to competently manipulate the environment, in this case through locomotion rather than with their hands. I suggest that as a result of these opportunities, environmental competence is markedly weaker among those families which are traditionally called "white collar" and which are materially more wealthy.

I noted that although the town's elementary school was extremely broad-minded in its recognition of children as active learners, and while this had influenced the teaching approaches, the children of manual working parents were not recognized for their resourcefulness. They commonly scored below average in the school grading system. The teachers used other indicators than resourcefulness for what they frequently term an "intelligent" child.

These are academic indicators, all of which involve heavy reliance upon verbal facility. Not surprisingly, the teachers find their "intelligent" children perform well on all of the classroom exercises: they commonly quietly carry a belief in innate intelligence as the major determinant of their pupils' abilities. This is a serious problem. The schools are preparing children who will perform well with the world as it is. A more realistic measure of "intelligence" for a society concerned with long-term human survival would include initiative or resourcefulness as central qualities; qualities which enable people to competently transform what is. Sadly, I frequently observed that the children who learn these skills were consistently discouraged in the schools because of their lower verbal facility.

A radical reorientation of the schools is required. They should recognize children's competent engagements with the environment as central to the definition of, and development of, intelligence. A future-oriented philosophy would see education as the process by which children learn to interact with, and, intelligently transform, the environment and themselves. "Environmental competence" in such an educational system would involve more than the effective construction and modification of environments. Children would learn to see a range of outcomes from their environmental manipulations. They would have to learn to make trade-offs within the framework of a developing sense of social and environmental responsibility. Children would not only learn to see themselves as potentially capable builders or modifiers of their built environment but they would also come to fully comprehend their total resource dependency, involving for example, learning to provide food through foraging and cultivation. As long as we fail to teach these things, we are enforcing a dependence upon others. Education should be a liberating force. Conscious interdependency (cooperation) should be encouraged; unwitting dependency upon a technocratic society is dangerous for all concerned.

Children's feelings for, and use of, the environment are not the only training grounds for developing a dependence in children upon unknown others for the provision of their basic environmental resources. The philosophy of urban planners and designers for instance is that children need only very specific places and equipment for their play. Observing and talking with children about their feelings for, and use of the environment reveals how false this notion is.

Children's Feelings for, and use of, the Environment:
Some Implications for Land-Use-Planning

Planners Must Begin by Asking

This investigation made an initial attempt to develop a taxonomy of children's places but there was not the time to develop a systematic and comprehensive approach to children's place-differentiation. The interview procedures did reveal many place discriminations that are unique to children. They revealed that future studies of children's land-use, even those relying primarily upon observation of children, must utilize environmental categories generated by children. If they do not, they cannot expect to move beyond the traditional adult land-use categories in the generation

of environmental planning criteria. It is clear from this investigation that while these environmental categories are often very different from those of adults, they are not, as Lowenthal (1960; 1972) suggested they would be, unique to each child. Many of the child-generated categories such as "dirt-for-building", "climbing trees", and "long grass for hiding and building", show a high degree of consensuality. It is notable that these place categories carry the purpose or use of the place in their description; they are hyphenated functional place names. This is different from the shorthand place-naming with which we are familiar in the adult world. They are nevertheless equally important as consensual descriptors of the environment. The development of a systematic approach for the comparative study of children's place-naming, perhaps through ethno-linguistics, would be an extremely valuable step toward our understanding of what constitutes diversity of experience for children.

Children's place-names reveal that child-culture generates some of its own categories of meaning. This is valuable information. It contradicts a popular notion that the world of childhood is highly personal and subjective except when children are communicating through adult language categories. Furthermore, it was found in this research that the way things are used by children not only influences the names they are given but that these names in turn influence future place use; place names become normative prescriptions for use.

Environmental Planning and Design: Some Little-Recognized Qualities of Children's Land-Use

While it may be some time before we can offer environmental designers and planners a comprehensive field guide to children's land-use categories, I can point to some principles revealed by the children of Inavale which are probably universal. For those disenchanted designers wondering what to do now that more than just a few social and behavioral scientists and journalists have documented how little most playgrounds are used, they may well look to the natural history of children for clues. There have been a number of rather comprehensive observational studies of children's land-use over the past decade (Appendices A-1 and A-4). These have been able to highlight some important qualities of children's transactions with the environment that are of value to the planners of residential areas. This investigation, however, has demonstrated that some inherent weaknesses in these observational approaches have led to the systematic exclusion of certain important aspects of children's use of the land. One extremely important point environmental social scientists have failed to point out to designers, planners and developers, is the very small size of many of children's important landscape qualities. If environmental designers and planners wish to plan environments which anticipate the diversity of children's extremely limited free range of movement, they should create or preserve environments with much "finer-grains" than the blanket-like suburbs and new towns they have been providing to date.

The specific qualities of the land which are important to children require further comparative study in urban and suburban environments before we can say what would constitute a suitably diverse landscape for children.

From Inavale the important qualities vary somewhat with age, but it is notable that the most important qualities to the children of this town--sand/dirt, small shallow ponds or brooks of water, slight elevations of topography, low trees and bushes, and tall unmanicured grass--are systematically removed from all new residential areas, even the highly applauded new towns. A most remarkable aspect of such towns and suburbs is that a central rationale for those persons moving to them since World War II, has been that they offer an excellent environment for their children! This rationale has been based in popular adult images of nature and open space which are devoid of any careful reflection on children's activities and experiences. In fact, it seems to be based in a rather narrow visual aesthetic appreciation of highly "manicured" green space.

One particularly important quality of environments for children is its suitability for modification by them. Adopting a theory of adaptation, it may be argued that one way people can make themselves comfortable in an environment is through the complimentary processes of giving order and meaning to an environment (as described above under "The Importance of Environmental Knowing") and of physically modifying it. In these complimentary ways it is possible to make oneself "at home" in an environment. The children of this research for example demonstrated to me how much they value paths which they have "found" or made by themselves, compared to the path network given to them by planners and engineers. They also showed me how important the freedom to make other environmental modifications is, particularly the opportunity to make places for themselves. It is hoped that this information will not only support the arguments of "adventure playground" proponents but will also go a little way toward convincing planners of the need to think more generally of how to create environments in which children may "find" or create their own settings for play. The findings have been limited of course to a relatively rural environment. Future similar research will undoubtedly find suburban children frequenting brickyards and abandoned farm fields and city children sneaking into abandoned factories more than playgrounds and playing fields (1).

If we are to deal with ever-increasing land-use problems in a flexible manner, we must think and plan in a truly ecological way. This must include the recognition of human ecology. From looking at children ecologically this study has shown that a most important quality of their interaction with the

1 For some indications of the place qualities valued by children of a British suburban housing estate in addition to those summarized in the play studies described in Appendix A, see Play and Place: Transforming Environments, a film and companion program notes prepared by the author for the BBC Open University Series, "Art and Environment". For some similar suggestions of the qualities valued by inner-city children, see "Our City and the Places We Play", prepared in collaboration with the children of Stevens Elementary School, Washington, D.C., and Simon Nicholson, Mark Francis and Raymond Lorenzo. The fundamental argument was made some time ago by Simon Nicholson (1971) in The Theory of Loose Parts. Current research being carried out at the Environmental Psychology Program of the City University of New York with Cecilia Perez is developing simple techniques whereby children can work as research associates with planners in the identification of their important land-uses.

environment involves the finding and making of places for themselves. Presently, environmental planning and design is viewed totally as the business of providing specific places and things for specific functions; one design solution per one design problem. Multi-purpose, flexible use, and local initiative are some of the necessary planning concepts which have only recently entered the planning vocabulary. Leaving some opportunities for people to develop a balanced relationship to the environment through their own actions upon it, remains a radical challenge for planners.

APPENDICES

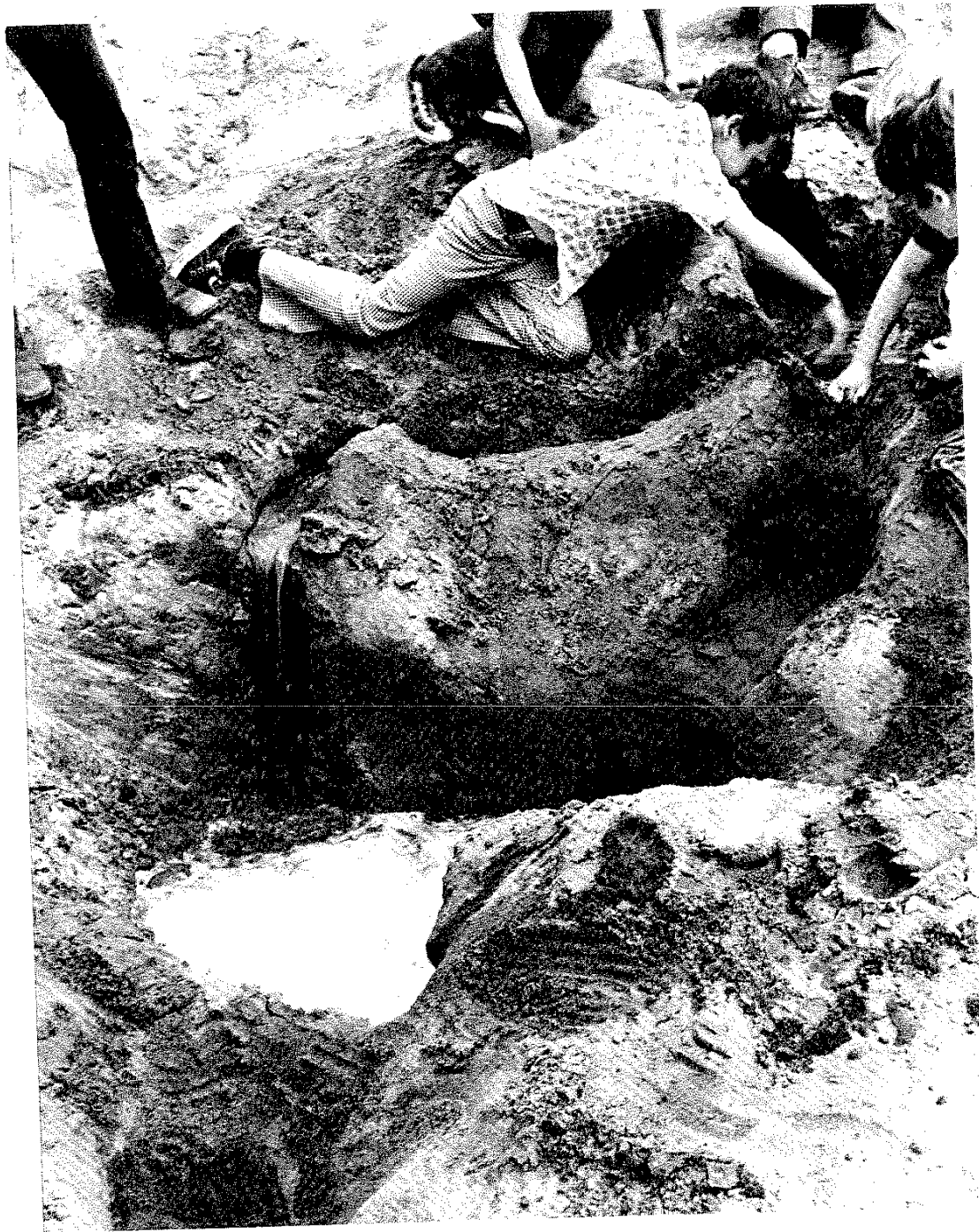


PLATE XX

"Throughout this investigation it has been noted how important the physical environment is to children's developing conceptions of their effectiveness."

APPENDIX A-1

REVIEW OF THEORY AND RESEARCH ON CHILDREN'S SPATIAL ACTIVITY

Locomotor Development

Locomotor development has been carefully observed in this culture along with the development of other motor behaviors. Because the occurrence of the transitions such as reaching, grasping, sitting, and standing are clearly observable, they are subject to less controversy than other aspects of child development. Certainly within the first eighteen months there does seem to be a high degree of universality with regard to the age of occurrence of locomotor-related behaviors. Consequently, age-related statements are subject to less controversy than the development of other behaviors. The most comprehensive observational research of infants was conducted by Arnold Gesell and associates at the Yale Clinic of Child Development (Gesell et al., 1940, 1946). The average age of occurrence of those locomotor developments of particular importance to this review according to Gesell are:

16 weeks	Moves to crib from bassinet.
28 weeks	Sitter; moves to chair; much time spent in active manipulation.
44 weeks	Creeps on hands and knees.
1 year	Stands momentarily alone; walks with one hand held.
1½ years	Runs stiffly; walks alone--seldom falls.
2 years	Rides kiddy car; runs without falling.
3 years	Rides tricycle.
5 years	Climbs with sureness.
5½ years	First bike ride (two wheeler) for many.
7 years	Can ride bike for some distance.

With observations of at least fifty children in each age group we may assume these averages to be quite accurate. But they should be seen only as averages, for there is considerable variation between individuals in the age of occurrence of these transitions (for a more detailed summary see Table A-1). Cultural and racial differences have rarely been subject to systematic comparison and interpretation, but it does seem that the age of walking shows a remarkable degree of universality (see Dennis, 1938 and 1940, for a discussion of Hopi Indian children; one group which does learn to walk a little later than white American children.) The sequence of these behaviors are extremely important in any conceptualization of the development of children's spatial behavior.

In a rare book on the psychology and sociology of sports, Cratty (1967) bemoans the dearth of studies which relate parental restrictions of physical mobility to the activity levels and physical skill of their offspring. Cratty believes the general attitude parents have about activity exercises an

influence upon a child's vigorous participation in movement activities. He believes that parents modify not only the child's opportunity to participate, but the intensity with which that participation occurs. Unfortunately, although the book is generally written in the style of a review it must be read as highly speculative; no specific references or empirical sources are given for these ideas.

Children's Spatial Activity

There is much less agreement between studies which have attempted to describe age-related changes in the specifics of children's spatial activity. This is not at all surprising because, unlike the development of locomotor ability, there can be no question that spatial activity is influenced by a great variety of cultural and environmental forces. These studies were carried out by psychologists, anthropologists and geographers for different reasons, using different methodologies and offering varying degrees of reliability. The research approaches of these studies are critically reviewed in turn below, and their results compared in tabular form (Table A-1).

Normative Developmental Research

Gesell's research was concerned with children from birth to ten years of age (Gesell, et al., 1940, 1946). Mothers were interviewed for those aspects of Gesell's work which deal with spatial activity. A case record was kept for at least fifty children in each age group while the mothers of fourteen children were interviewed every six months from the time their children were six to the time they were nine years of age. Percentage frequency counts of data were made but were not reported by Gesell. Little more can therefore be said of the findings than to present them as Gesell does:

The maturity traits are not to be regarded as rigid norms, nor as models. They simply illustrate the kinds of behavior (desirable or otherwise) which tend to occur at this age. Every child has an individual pattern of growth, unique to him. (Gesell and Ilg, 1946).

Other accounts of normative changes in children by age have been written since this early research of Gesell, but they fail to provide information on the source of their generalizations. Such writing is best ignored in a critical review such as this.

Mother-Child Attachment Research

John Bowlby's Attachment Behavior Research

Of particular value in this survey of the spatial manifestations of theories on child development is the observational and experimental work of John Bowlby (1969). Because it includes behavioral observations, it is much more explicit regarding the child's spatial behavior vis a vis the mother than purely psychoanalytic accounts.

Much instinctive behavior maintains an animal for long periods of time

in a certain sort of relationship to certain features of the environment; a now classic example is territorial behavior, which enables the maintenance of location within a certain part of the environment over months and even years (Bowlby, p. 286). Bowlby notes that behavior of this kind can be organized on different degrees of sophistication. A less sophisticated version he notes "could be organized so that movement towards a specified goal-object would become increasingly probable the greater the distance from the goal-object" (p. 288). Bowlby proposes that attachment behavior between mother and child is organized in this way. He amplifies the dynamics of this theory considerably but it has not yet been elaborated empirically to anything like the degree of the migration models or industrial location models familiar to geographers.

Figure A-1-1 illustrates Bowlby's notion of attachment behavior as but one class of four separate classes of behavior that make up mother-child interaction. Each class of behavior will be discussed in turn.

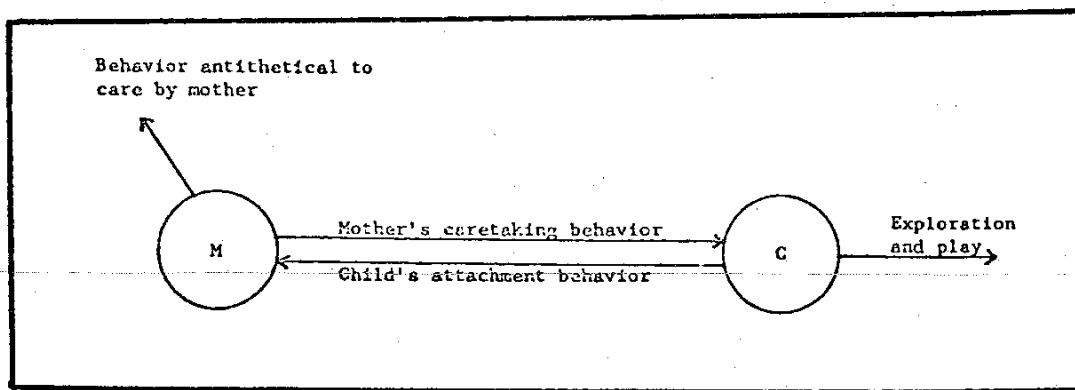


FIGURE A-1-1 The Spatial Dynamics of Mother-Child Interaction (after Bowlby, 1969) (This diagram simply sketches the elements of Bowlby's model. The relative importance of these vary at different times.)

Exploratory behavior and play, as discussed below, are a class of behaviors which draw a child away from the mother and hence are antithetical to attachment behavior.

Maternal Caretaking is defined by Bowlby as "any behavior of a parent, a predictable outcome of which is that the young are brought either into the nest, or close to the mother, or both" (Bowlby, p. 291). Of the conditions that activate maternal caretaking, Bowlby mentions two which are environmental, as opposed to organismic. They are therefore of particular interest in this research. First, when an infant strays beyond a certain distance and secondly, when an infant cries for some external reason. In both situations a mother is likely to act by recovering the infant to her arms, especially if others are seen to be carrying the child off or there is some other cause for alarm. Sometimes however, especially when the infant is playing contentedly with other known individuals in the vicinity, she may let things be and simply keep a watchful eye, while alert to act at short notice (Bowlby, p. 292). It is

interesting to note the biological function of retrieving behavior for mammals as outlined by Bowlby: it is a protective function offering safety not only from predators, but "of falling from a height and from drowning." Froebel, who seems to have been a particularly observant and sensitive philosopher of child-environment transactions, noted these two fears many times as important elements in the crucial balance between protective parents and an environment which must be explored and learned by the child (Froebel, 1887). Maternal retrieving behavior is seen most clearly in sub-human species, but in primitive societies a mother is likely to remain very near her infant and almost always within earshot or eyeshot. In "more developed" communities this situation is more complicated through the use of deputies for part(s) of the day, but the experience of a strong pull to be close to the baby is common in most mothers (Bowlby, p. 293).

Behaviors Antithetical to Care by the Mother are sub-categorized by Bowlby into "competing behaviors" and "withdrawing behaviors." He recognizes that even household duties compete to a degree with infant care, but explains that these can usually be dropped at short notice. Others, notably the demands of other family members, are more intractable. He clearly distinguishes these "competing behaviors" from behaviors incompatible with care, such as dislike of contact with the infant, or of his or her screaming. Such "withdrawing behavior" is only frequent or prolonged in an emotionally disturbed mother.

Attachment Behavior begins with an infant's proximity-maintaining behavior, in the form of crying or following when mother leaves a room. This begins between six and nine months according to Bowlby. Over the next two to three years a child gradually makes excursions away from the mother and occasionally goes out of sight. It has been found that children will explore more readily if their mother is present, a difference which becomes particularly marked when a strange person is present or when mother and child are in a strange (i.e., unfamiliar) place (e.g., Ainsworth and Wittig, 1969 and Rheingold, 1964). After three years of age children become much better able to accept their mother's temporary absence and to engage in play with other children. Many children show such an abrupt change to this kind of behavior that it suggests to Bowlby the existence of a maturational threshold. Children in this fourth year of life are increasingly able to accept subordinate attachment figures, such as a schoolteacher. There remain conditions on such substitutions however. First, the substitute must be a familiar person, preferably known through the child's mother. Secondly, the child needs to be a healthy personality and not easily alarmed. Finally, and most important for public, environmental, educational and child-care policy, a child needs to know where mother is and he or she needs to feel confident that contact can be resumed at short-notice in an emergency. In this way children are gradually able to reduce the degree of attachment with their mothers but even at six or seven years of age a child takes to hold a parent's hand and resents it if they refuse. Throughout the latency of a normal child, attachment behavior continues as a dominant strand of life.

Ecological Psychology Research

Psychologists have carried out remarkably few observational studies of children in "natural settings," i.e., settings not manipulated by a

researcher. There is a preference for laboratory research where the child can be given tasks or problems, tested, or otherwise drawn into prearranged situations. Of the purely observational child psychology research carried out prior to 1958, reviewed by Wright, most had been at the room-scale, with over 50% in Nursery Schools alone (Wright, 1960). It may be reasonably assumed that a prime reason for this has been convenience, the same convenience which accounts in part for the fact that 94% of these studies have been with pre-school children, (Wright, 1960) and that most of these were of above-average intelligence, Judeo-Christian in culture and ethnic background, and from high socio-economic strata (Gellert, 1955). Only two of the 110 investigations observed children in communities-at-large (Wright, 1960). Both of these were carried out by the Mid-Western Field Research Station in Kansas using an approach termed ecological psychology (Barker and Wright, 1951; Barker and Wright; 1955).

The ecological psychologists claim they are in no way selective in making their observations in the field. The observer aims to make a faithful record of "everything" as it comes in the behavior and situation of the child. Nevertheless until recently they failed to describe any of the children's spatial activity or their interaction (overt or otherwise) with the physical environment. Instead they have described only social interactions, as though all behavior in children is socially motivated. This is acceptable if one's goal is to describe socially defined "behavior settings" but the research should not be described as a total, or even balanced description of behavior. This is the claim of the ecological psychologists when they write of being "transducers" only and in no way "operators" in their observation and analysis.

In one rare study the ecological psychologists deal significantly with children's transactions with qualities of the physical environment (Gump, Schoggen and Redl, 1963). In attempting to identify and describe certain psychologically relevant characteristics of common child recreational offerings, they designed a research project to "learn how behavior in a special child-centered milieu would differ from behavior occurring in the more usual home-neighborhood setting" (Gump et al., 1963, p.). They chose a summer camp as a child-centered environment common to United States culture. They found that the camp exceeded the home and home-neighborhood in the duration of active play and the frequency and duration of investigation and exploration. They related this degree of activity directly to the qualities of the physical environment, as with this description of one camp day as compared to one home day for one boy, Wally:

Investigation and exploration seemed also related to the availability of the woods. There were 27 such episodes (i.e., episodes of different behaviors) in the camp woods alone and only 10 in the entire home day. In the woods were a number of unknowns. What is a hollow tree? What's that funny looking stuff on the ground?, etc. Although the boys had been at the camp almost four weeks, the novelty of the woods had not yet worn off; no comparative novelty seemed available in Wally's home neighborhood environment (a busy residential street in a suburb of a large city, with two public parks within walking distance). (Gump et al., 1963, p. 182).

These observations are interesting in that even a group of psychologists who commonly wear the traditional filtering lenses which only enable them to observe social interactions when faced with comparative data were struck by the important role the physical environment can play in influencing exploration for instance. Exploratory behavior is not discussed in this section because there have not been other similar naturalistic studies of children out-of-doors. It is discussed conceptually in the subsequent section of this review however, for it is considered to be an important dimension of place learning (see A-2 : Place Knowledge).

As an extension of their long-term, detailed observation study of the patterns of children's social interactions in one mid-western town the ecological psychologists have made some measurements of "activity range." They did this as part of a large comparative study of children's behavior in the small town as compared to a large town (Wright, 1969). Unlike all of the other studies reported here, no metric measurements of physical distance were involved in their analysis. Instead they took their standard measure of significant social situations called "behavior settings" and recorded variation in the number and diversity of different behavior settings entered by each child. Furthermore, the analysis was limited almost exclusively to comparisons of the two different-sized communities; no attempt was made to compare children's activity range according to their sex or their age. There are however some observations of value to this study. They found that the children of large towns had larger activity ranges (i.e., entered a greater number of different settings) than those of the children of small towns. They discovered however that this difference in the size of range was less for children nine to 11 years than for children six to eight years in the two towns. Perhaps this reflects a kind of threshold in the expansion of the large town children's range which will only be exceeded significantly when they obtain some form of mechanized transport after 16 years of age. There are dozens more interesting findings but few of them deal with age-related differences at all and there is very little discussion of the findings. The data, collected over a long period by direct observation, records kept by mothers, and interviews of children, remains an extremely valuable data base for future analysis of the children's spatial ranges and activities.

The Cross-Cultural Study of Spatial Restrictedness as a Dimension of Child-Rearing Practice

Studies of child-rearing, both by psychologists and anthropologists, commonly use "restrictedness" versus "autonomy-granting" as one index of socialization practice. This often involves some measure of spatial restrictedness. The investigation closest to the study reported here in terms of culture and environment was of a New England town under the name of "Orchard-town" (Fischer and Fischer, 1961). This study, part of a large cross-cultural research program on socialization carried out in the mid 1950's by the universities of Cornell, Harvard and Yale, employed ethnographic procedures: a mixture of observation and interviewing of selected "informers," in this case mothers (Whiting and Child, 1961). The findings summarized in Table A-1 were extracted from a larger report of socialization practices. They do not report any specific data, but their generalizations on this little-studied area are worth reporting.

They note that for pre-school aged children there is always the mother (or occasionally a substitute) in the house and that even "small children" may play in the yard in good weather while their mother works inside, listening for the child's cry. They explain that a three or four year old may have only a few yards adjoining the yard in which to play, but that the area of free movement increases gradually with age. Traffic is the only restrictive danger discussed. While noting that though most four year olds may be allowed to cross quiet streets to play with other children, most play is in the child's own home or in a neighbor's yard. One four year old girl in the study was allowed to cross a busy street about two blocks from her home by herself and the investigators commented that she seemed to be reliable and competent in the exercise of this freedom. Crossing forbidden streets and going long distances from home without permission were described along with match and knife play as subject to severe punishment. These pre-school children spend much time "going places" with their tricycles or wagons. Not until school-age at the earliest, do children usually obtain a bicycle.

Another ethnographic study of socialization proved valuable even though it provided no comparative data by age. It pointed to some interesting differences in the treatment of children, not only according to their culture, but also in terms of their sex and the physical environment surrounding their homes. The study provides a description of socialization in a rural Puerto Rican village and makes systematic comparisons of child training and child behavior between these village families and those of an urban New England community. One of the sections of data obtained from five to six hour long interviews with 18 Puerto Rican mothers and from observation of 113 families was concerned with "physical mobility." The interview focussed on children between four and seven years of age. Landy created a scale of restrictedness of physical mobility where 4.0 is "an index of extreme restriction." The median for boys was 2.5 and for girls 3.0. Unfortunately, Landy gives no indication of what these indexes represent in terms of distance of an area. Neither is it clear whether this particular section of data came from the observations or from the mother interviews. Landy identified another difference between boys and girls relevant to this research: the frequency with which the mother checked them when they played alone. With 4.0 as a very high degree of checking, girls had a median index of 3.5 and boys had one of 3.0. Again, no indication is given as to what real unit, in this case duration, is involved. The reasons given for the frequent checking of the children were the child's potential for mischief and for learning bad things from other children. No data are provided on the development of these differences, but it is noted that after six to seven years of age when utilitarian roles were found for the children, while girls become less "clingy" and become more of a "companion" to the mother, they are not given greater freedom of physical mobility as are the boys. This begins to suggest one of the dynamic factors in these differences. The mother, usually responsible for caretaking of children, brings girls more quickly into line with the woman's role in the home than the mother or father does for boys.

Landy believes the sharp curbs on children's physical mobility is related largely to the desires of both parents to encourage dependency, though he concedes there are some realistic bases for maternal fears. The children live in two distinct geographical environments--a roadside and a mountain

ridge. In the former environment there is a real menace of terrain and in the latter there is the danger of fast traffic. The degree of physical mobility allowed is described as being the same for the two groups though the roadside group has less play space. Presumably this is because of the traffic, but it is hard to know exactly what is meant without seeing spatial data.

The same interview schedules as Landy's were used in a similar study with 372 urban mothers of kindergarten children from a suburban-residential and a working-class residential area in Massachusetts (reported in Landry, 1965). The mothers were divided into upper middle class (198 mothers) and upper-lower class (174 mothers). Table A-1-1 compares the degree of checking on the children between the rural Puerto Rican and the two U.S. classes

TABLE A-1-1
Keeping Track of Children by Culture and by Social Class
(extracted from Table 30 of Landy)

Puerto Rican Rural- Lower	U.S. Urban- Lower	P	Puerto Rican Rural- Lower	U.S. Urban- Middle	P
89	53	.01	89	42	.001

10 = rarely checks; 90 = often checks

of mothers. Landy writes that "The more protective, even overprotective, island mothers keep closer track of their children, checking on their whereabouts much more frequently than either group of their mainland contemporaries." Mothers of the middle class U.S. group check the least according to this data. Unfortunately there is very little comparative data by age on the physical mobility of children but an interesting observation in the Puerto Rican population is that at six to seven years of age, utilitarian roles are found for children which result in the boys being allowed greater physical mobility. For girls of this age, there seemed to be no change in their freedom of movement.

Two other studies of the spatial range of children have recently been reported, both of them with Bantu-speaking societies in Kenya (Munroe and Munroe, 1971; Nerlove, Munroe and Munroe, 1971). The purpose of the studies was to explore the relationship between environmental experience and spatial ability. In the first study, fifteen boys and fifteen girls between the age of three and seven were sorted into pairs on the basis of age matching. Each of these sample members were then observed in their natural setting around the village a total of twenty times, and their location recorded. Analysis of children's distances away from their respective homes, revealed a significant tendency for males to be farther away from home than their age-matched female counterparts. However, these scores included observations of the children when they had been instructed by an older person to carry out some assigned

task away from the home, such as fetching water. Munroe and Munroe found that observations involving directed activities should be separated for study. They therefore somehow went over their data again and extracted only those observations made of children during their "free" or "undirected" time. This time they found in thirteen of the fifteen pairings that the male was rated as more distant from home on the average than the female ($p < .01$, sign. test). In addition, the proportion of free time was analyzed. This was found to be greater in boys in only nine out of thirteen cases; an insignificant difference until they looked more closely at the ages and found that in eight cases out of the nine oldest pairs, the boy was either more free or equally free than the girls. In the second study using the same techniques with another Bantu-speaking group, "free range" of children proved to be non-significant in differences between boys and girls, but because the society was very different in activities it was decided to modify the analysis. It was concluded that although herding was a directed activity, it left the child relatively free to meander to different places over varying routes, and hence, was effectively the same as "free range."

The Geographical Study of Children's Spatial Behavior

Some of the most useful research on the spatial behavior of children has been carried out, not surprisingly, by a geographer. Margaret Tindal of Clark University conducted an empirical study for her masters' thesis on the home range of black elementary school children (Tindal, 1971). Children of second and fourth grade age in an urban ghetto in Baltimore and in a suburban area twenty-five miles from Baltimore city were interviewed. Twelve or thirteen children of each sex were chosen from each of the two grade levels, a total of fifty children from each school and one hundred for the total sample population. The core data in the investigation was derived from an interview schedule which lasted between thirty and forty minutes per child. A large (20" x 20") vertical aerial photograph of the neighborhood was used throughout the interview to facilitate communication between the investigator and the child on the child's home range. Responses were recorded on a sheet of acetate laid over the photograph. Only the first part of the interview and related findings, dealing with spatial activity, will be reviewed in this section; the second part, children's preferences and aversions to places, is considered in a later section of this review. Before proceeding with Tindal's results, some of the terms employed by her need to be clarified. She herself admits to the confusion over the term "home range" but continues to use it. To avoid confusion I shall describe what is in effect her operational definition of home range:

To measure "home range" a surrogate measure is employed; this is the aggregate non-redundant path length, defined by the by the child's paths to specified nodes. This "TLP" (total path length) measure is used to define "home range" rather than an areal measure because of its greater ease of determination and lesser ambiguity (p. 8-20).

Also, the term "radial range" is defined by Tindal as "the linear distance of the longest continuous path away from the child's home to its furthest radial extremity" (p. 8-20). Tindal also paid particular attention to "activity nodes." These nodes are defined as "focal points or areas where certain

activities are carried out," and are classified as recreational, commercial, educational, or social.

Tindal confirmed her hypothesis that the home range of suburban black elementary school children is less restricted than that of urban black elementary school children; the mean home range of the suburban children was 4,810 feet as compared to 4,074 feet for the urban children, a difference of 736 feet. (No significance tests were reported in this research.) Tindal suggests a number of possible explanations for the difference in range between the two groups: suburban areas are more dispersed and offer fewer threats and hazards and perhaps a lower density of attractions than urban environments; the children walk farther to reach school, stores, play areas, and friends' houses. Her casual observations of the study area support these ideas but she offers no evidence, anecdotal or otherwise, of the influence of the relative safety of the environment. The home range of fourth grade girls in both environmental groups was less than the home range of second grade boys. From this, Tindal concluded that:

. . . boys are generally more mobile than girls of their own age or older, and as a result of their greater mobility, they tend to explore their immediate environment on a much larger scale than do girls (and perhaps vice versa--the more they explore, the more mobile they become) (p. 8-27).

Tindal again suggests some explanations for her findings. She claims that when questioned on the subject, girls spoke of more places in their neighborhood where they were afraid to go or where their mothers refused to allow them to go than did boys.

Tindal investigated the influence of bicycle ownership on the home range of the children. Not surprisingly, she found a greater mean home range among bicycle owners, with the exception of the second grade suburban girls. With these children, the reverse is true. Tindal suggests that although three-quarters of the girls in this group have bicycles, they are limited by parents in the extent to which they may use them. Because more bicycles were owned by the suburban children than by the urban children, bicycle ownership is one factor accounting for the larger home range of suburban children. Nevertheless, the mean home range of even the non-bike owners was greater for the suburban population than the urban population though the 'n' was particularly small, and no measure of statistical significance is provided. Concerning age differences, Tindal writes: "The findings suggest a developmental sequence of home range, as older children were found to have a greater home range than younger children, with the sole exception of the suburban fourth grade girls (whose home range was less than that of the second grade urban girls)" (p. 8-32). Certainly Tindal's research does suggest an extension in the size of home range with age but such a conclusion is not at all surprising; what we need to know is the nature of this sequence. However, the secondary discovery, regarding fourth grade suburban girls, is most interesting and worthy of further investigation. One sub-hypothesis of Tindal's is that the "home range of children in the suburban environment is less restricted than that of children in the urban environment" (p. 8-32). She confirms a difference in spatial range but fails to provide any data on spatial restrictions either from the parents, from other social elements in the neighborhood, or from the en-

vironment itself. It seems then that this confirmed hypothesis includes an assumption.

In summary, Tindal's research asked some interesting questions, but suffered from a major weakness. Though a hypothesis-testing research design was employed, the population was too small to enable the application of statistics. Hence, the hypotheses were not tested in any statistically significant manner. Nevertheless, some of the data is most suggestive and worthy of further investigation. Of particular interest are Tindal's findings concerning the differences in the spatial range of boys and girls. Taken together with similar data from other cultures, reported in the previous section, this issue becomes worthy of special consideration.

The Investigation of Children's Spatial Behavior for Urban Planning

There have been dozens of studies of children's use of the residential environment. Many of these were conducted in order to investigate the assumptions of planners concerning the danger of traffic and the effect on spatial range of different housing layouts. All used some kind of observational sampling as the central method. With this technique, an observer makes a set walk around the area under study at fixed intervals during a day and records the location of each child, together with their sex, age, and activity; in short, their land-use. The most comprehensive and among the best administered of these children's land-use studies have been those conducted in Britain by the Building Research Station (Hole, 1966) and the Department of the Environment (Nicholson, 1968; Reynolds and Nicholson, 1969: These and other research reports have now been summarized in Littlewood and Sale, 1973). All of these studies were conducted on city housing estates. In the Department of Environment studies sixteen estates were selected to give a comprehensive range of building forms at a variety of densities. An observer made set walkrounds which enabled complete surveillance of the study area. On each walkround, made at prescribed intervals during the day, the location of each child, their sex, age and activity were recorded. Observations were carried out for 12 hours a day during the summer school holidays when outdoor play is assumed to be at its peak. Each estate was observed for four days--2 weekdays, Saturday, and Sunday.

The findings of the Department of the Environment studies together provide a valuable comparative account of children's use of different landscapes. Some of the more important observations are summarized below.

1. Most observations were of children between 5 and 10 years of age, for though the children "were still at an age when most of them would not be allowed to wander far from home, they had nevertheless reached an age when most parents would let them play near to their homes, especially with friends" (Littlewood and Sale, 1973, 7). Consequently, only 17% (approx.) of those under five and 13% of those over 11 years of age were seen out of doors, whereas, 30% of those between 5 and 10 years of age were observed outdoors. Littlewood and Sale were not surprised to find that the secondary school children (over 11 years) were the least seen: "It is unlikely that the average housing estate can provide a sufficiently sophisticated range of facilities to prevent them from going further afield for their leisure pursuits." Furthermore, they state that "at this age, most are allowed to come and go very much as they please, and few parents feel it necessary to keep them continually in sight" (p. 8), a statement

that accords with the observations of Bowlby on mother-child attachment summarized above.

2. For children over ten, the physical characteristics of where they lived had little influence over the amount they played near to their homes. For those under ten years of age however the physical characteristics of the estates did have an effect. The most important factor seemed to be whether the child's dwelling had a ground floor access or not--"for mother and child to be in sight and sound of each other is probably what counts" (p. 9). Littlewood and Sale concluded that "proximity to the ground means that the young child is less likely to treat the outside as a special outing but as a part and parcel of normal home life, and as a continuation of the home environment" (p. 9).

3. At least three-quarters of the children--whatever their age, but particularly under five's--were observed playing "near to the home" (p. 12). As they failed to record the identity of the children they felt obliged to follow with an admittance that they could not say for certain if this was so. It is one of the major weaknesses of these land-use studies that no conclusions can be drawn on the spatial range of children's activities, or the use of different places by the same children. This should be clearly admitted instead of blurring otherwise well documented empirical findings with such semi-empirical statements. Nevertheless, this tendency for children to play in the direct vicinity of the dwelling--"doorstep play"--in spite of suitable alternative places for play has been noted by other studies (Hole, 1965; Morville, 1969; Wohlin, 1961; Brower, 1973).

Unfortunately, although the question of children's access to the out of doors had been the prime reason for conducting the research, these British Studies failed to directly investigate spatial activity. Instead they relied entirely upon the observation of behavior through surveys at fixed times of the day. To discover patterns of spatial activity one needs either to follow an individual around (as in the ecological study of baboons) or interview them. These housing studies did neither and so can say nothing with great confidence about the influence of housing layout on children's spatial behavior.

A number of studies of children's land-use have been carried out in Scandinavia, but only one of them, from Copenhagen, Denmark, is available with an English summary (Morville, 1969). Morville shows a rare degree of caution in reporting this research by noting that because only two housing estates were studied, generally applicable conclusions cannot be drawn, but whenever possible the results are correlated to the results of other studies, especially Swedish ones. One of the estates consisted of 660 flats in three story blocks; the other estate with 434 flats was made up of 15 story blocks. The estates were demographically comparable. Interviewing and observation were used. Interviewing was conducted with 28% of the total number of women on the estates: 272 mothers accounting for 466 children. The basis for selecting these mothers is not explained. The observations comprised all of the 1,610 children in the estates in so far as they were outdoors during the observation periods. The outdoor spaces were divided into altogether 46 observation areas within which the pre-school and the school children were recorded every fifth minute from 8 AM to 8 PM on a number of weekdays (the observations were made during the summer school vacation). Altogether, 6,600 observation charts were filled-in.

Some of the findings of this research are summarized because they reveal the commonality, even across cultures of certain aspects of children's land-use:

1. Many dramatic differences between children living in high-rise as opposed to low-rise housing are reported. Pre-school children in the high-rise housing were less likely to play outside alone, came out less frequently, stayed out longer, and had less contact with playmates, than children in the low-rise flats. One important reason for this was found to be the reduced possibilities of the mothers' watching and communicating with the child playing out of doors while she is in the home. About 75% of the mothers with pre-school children in both estates considered it important to be able to watch the child when the child is playing out of doors and even more of them wish that the play space should be within easy hearing. This is in direct accord with the British research reported above.

2. Children's range of activity increases with their age: over 90% of the pre-school children and about 70% of the school children "usually play" within a distance of 100 meters from their homes. For those who "normally" play within 200 meters of the home Morville provides percentages of 7% for five to seven year olds, 17% for seven to 12 year olds, and 50% for 13 to 16 year olds. Unfortunately, it is not clear what "normally" and "usually" mean in this study. Morville claims that traffic is a major factor limiting range and that other Swedish studies seem to show that increased traffic differentiation seems to result in an increase in the range within which children move.

3. Children, particularly young children, play in access spaces. About 40% of the children in the low blocks and 25% in the high blocks play in access spaces. This is said by Morville to accord with other Swedish studies which show that the side of the house with the front doors is the preferred side for play and the center of activities. The British studies had similar findings with even higher percentages and Jane Jacobs reported this desire in children in her account of American cities (Jacobs, 1961).

An improvement upon these largely observational studies was a recent investigation by Ellen Bussard at Cornell University (Bussard, 1974; Coates and Bussard, 1974). Bussard selected 35 children to represent the four to 12 year old age group in a recently built medium-density, low and moderate income housing development of a small industrial city in New York State. There was communication between the investigator and myself and so the methods bear much resemblance to those developed for this study. The Bussard Study was different in that a focussed attempt was made to determine the influence of environmental design and management factors on children's spatial behavior. This contrasts with the broader interest of this study in children's experience of place with spatial behavior as just one dimension. The study is the most useful of all of those reviewed here because it used direct interviewing of both children and parents as its basic methodologies, thereby offering greater validity and detail to the findings. The findings are best expressed in the author's own summary table (Table A-1-2). The findings are particularly valuable in the light they throw upon the different spatial ranges of girls and boys.

Kevin Lynch coordinated a study of how adolescents in four cities use and value environment (UNESCO, 1975). Its eclectic approach results in

TABLE A-1-2
SUMMARY OF FINDINGS OF BUSSARDS STUDY (EXTRACTED FROM COATES AND BUSSARD, 1974)

4-5 Year Olds	6-9 Year Olds	10-12 Year Olds
<p><u>Home Base:</u> Compact bubbles out front doors to boundaries (usually about 50'); lateral expansion to boundary (90'-140') and within a 120° cone of vision. Bubble out back doors (only for townhouses, family private zones to a maximum 30'). <u>Activities:</u> triking, biking, play with dolls, toys, in dirt, jacks, jump rope, hide and seek, ball games. No sex differences. <u>Zones:</u> family public, family private, group and section public if within sight lines. May include playgrounds (if safe path) and nearby friend's house.</p> <p><u>Territorial Range:</u> Existed for only 1/2 of all children. Usually short paths to playgrounds.</p>	<p><u>Home Base:</u> Expands by a factor of 10 in area and a factor of 5 to 8 in path length. Full access to group private, group public, and section public zones. Often includes friends' home base. Almost all girls' friends live within same or adjacent cul-de-sac. Boys' friends spread throughout own subdivision of site (north end, middle strip, south end). Boys use unowned areas more than girls. Boys home base larger. <u>Activities:</u> Girls: Quiet, e.g., jacks, dolls, role play, Boys: Ball games, tag. <u>Zones:</u> Girls: mostly family public and private of own and friends' houses. Also, used playgrounds more.</p> <p><u>Territorial Range:</u> Girls: 1/2 had none or only one node within site. 1/2 went to nearby store, or, rarely, to nearby scrubby area. Boys: all boys had off-site range that included stores and wild areas equally (e.g., "Snake Hill," the "Mountain," "Closed Road.") Boys' <u>Activities:</u> fishing, catching frogs, and tadpoles, shooting BB gun.</p> <p><u>Chaperoned Travel:</u> For only 1/2 of girls had chaperoned walks. Girls chaperoned to more places, 1/2 of which were stores.</p>	<p><u>Home Base:</u> Similar to 6-9 year olds for both sexes. Exceptions: two boys and one girl with 4-5 year old bubbles around house and long walking/biking paths to off-site nodes. Boys' pattern result of choice. Girls' result of parental restriction. <u>Activities:</u> Girls define "play" as playground activity. Actually they dominate playground. Boys define "play" as activities (see 6-9 year olds) that occur in wild areas with friends. <u>Zones:</u> Girls regularly use section public now. Boys regularly use unowned areas on-site.</p> <p><u>Territorial Range:</u> All children had off-site ranges. All girls went to stores, while only 1/2 went to wild areas; only one went to water area. Boys went more often to wild areas than stores and to more distant wild areas and water play areas. <u>Activities:</u> see 6-9 years.</p> <p><u>Chaperoned Travel:</u> More frequent for girls than boys. Girls averaged 2 chaperoned destinations, 1/2 of which were stores. Boys mentioned one place each, none of them stores.</p>

4-5 Year Olds	6-9 Year Olds	10-12 Year Olds
<p>Contributing Factors</p> <p><u>Parental Attitudes:</u> All wanted children within view and easy access to house. Areas of perceived danger forbidden: car areas of playgrounds with dangerous equipment and/or older kids. Children allowed out of sight only to go to playgrounds within boundaries or to known friend's home (never more than 2 bldg. away). Firm boundaries existed.</p> <p><u>Site Influences:</u> Boundaries set for children were small-scale differences in placement of buildings, roads, parking areas, playgrounds, etc. Sometimes even a crack in the sidewalk would be used. Large scale site divisions not used at all.</p>	<p>Contributing Factors</p> <p><u>Parental Attitudes:</u> Much stricter with girls than boys. Girls often still kept within view of home but never alone, but all boys went off-site. No girls allowed off-site. Girls were allowed off with friends. Girls were required to ask permission to leave area of house, boys were required to ask permission only when leaving the site. Firm boundaries set for girls, sometimes within site and always at roads and fences on edges of it.</p> <p><u>Site Influences:</u> Large-scale structure of development split site into 3 unequal sections to which children confined Home Bases. Availability, location and size of group private, section public, and unowned areas accounted for most differences in shape and structure of home bases and territorial ranges. The kinds of surrounding areas influence direction and extent of off site expansion. Expansion is strongest toward North (town) and for boys to west (wild areas) but western expansion is not deep. Eastern expansion, across truck route less intense and goes only as far as "The Rec." Clear on-site/off-site boundaries reinforce boundaries set by parents (especially for girls).</p>	<p>Contributing Factors</p> <p><u>Parental Attitudes:</u> For boys no distinctions made between going with friends or alone. Boys had no boundaries except truck route on South. Required to tell parents when leaving site. Girls still directly supervised. Were allowed to go shorter distances with friends. Two could not go, with friends, as far as Main St., and 2 not allowed off site at all, even with friends. Had to tell parents when leaving vicinity of house.</p> <p><u>Site Influences:</u> The dynamics of site influence are the same as described for 6-9 year olds.</p>

many interesting observations and suggestive insights. The purpose was not to collect rigorous comparative data as this was impossible given the budget. Its purpose was rather to demonstrate the kinds of simple research any country can do to study children's use and perceptions of their micro-environment. It is hoped that if these nations, especially those undergoing rapid urban development, can conduct such research they will be better able to chart the various human costs and benefits of economic development and thereby better inform local and national policy.

The findings are related to young adolescents only but, because this age group follows immediately upon the under-twelve year old's of this study, the conclusions have relevance to this review. The extent of children's spatial range was found to vary considerably. In the Argentine, Polish, and Mexican sample the children's daily play is in the house, school and the nearby streets remaining largely within an area half a square kilometer in size. By contrast, the Australian children ranged frequently over a five square kilometer area and sometimes travelled much further. Visiting friends it seems requires a long trip and their environment was more restricted in the variety of people, and activity opportunities, making travel more important to the children of this environment. Another interesting observation was that the Polish children of the city centers of Warsaw and Cracow roamed the city centers more confidently and their territories were more individualized than their peers in the Polish housing projects. Perhaps, we may surmise, the children gain confidence from everyday learning challenges in the densely active environment of the cities which is denied the children of the more cloistered and probably more homogeneous environment of the housing projects. Lynch goes on to describe the wider-ranging occasional travel of these children such as the hour to hour and a half bus trips all of the Mexican children take to their city center but in all of these observations it is most frustrating not to know what the important variables are which influence spatial range: social environment, physical environment or culturally-defined child rearing practices. To learn this would require a much more elaborate and expensive research design. Lynch does summarize from all of the studies however, what the most important barriers to movement are: personal fear, dangerous traffic, cost of public transport, parental controls (for the girls only), and lack of spatial knowledge. The latter factor is most interesting for it is not mentioned in other literature on spatial activity. However it would require a very careful study to determine what comes first--the "spatial knowledge" or the desire to explore. From this exploratory study we must presently be satisfied with this as a very interesting, but open question.

Studies of Children in Traffic

A number of studies have been conducted largely in European countries on the subject of accidents in which children were involved, and on children's ability to deal with traffic. These are rather difficult to obtain or to translate, but the most useful and comprehensive of these studies, by the Swedish Institute of Child Psychology, is now easily obtainable in the English language (Sandels, 1972). Both from the evidence of reports from individual governments and from international meetings of Ministers of Transport, it is clear that throughout Europe, traffic accidents are among the worst threats to children. More children are killed in traffic accidents than from all other types of accidents combined. There is no reason to believe the situation

is any different in North America,

The Swedish Institute of Child Psychology analyzed in detail the complete police investigations of a sample of approximately 20% of the nation's traffic accidents concerning children (aged 1-10 years) during the years 1968 and 1969. There were about twice as many accidents involving boys as there were girls. No comments are made on this most significant finding, but I might easily add some. First, the majority of the accidents involved children outside alone or with friends. If it is true, as some of the studies already reviewed suggest, that the spatial range of boys away from the home is larger than that of girls, then we should expect there to be more accidents simply on the basis of chance. Furthermore, one third of the Swedish accidents concerned children on bicycles. If it is true, as our North American study suggests (Tindal, 1971) that boys have greater freedom to use the bicycle, then another possible explanation is made self evident.

Only in accidents involving one year olds and two year olds were the majority of children accompanied by adults. The detailed analysis of the accident records led to the conclusion that the supervisors (parents, grandparents, pre-school and school staff, etc.) displayed a lack of knowledge about what can be expected from a child in traffic, so that they overestimated the ability of the children, though it was admitted that some supervisors were negligent out of necessity (presumably due to overriding and conflicting demands on their attention). Of course there were a proportion of cases in which children were hit by vehicles even though they behaved perfectly correctly (1/7th of the pedestrian accidents, and 1/5th of the cycling accidents). But in the large majority of cases children's own inability to deal with traffic was at fault and this Swedish report lays the ultimate blame on those persons responsible for these children. One other study attempted to study children's ability to deal with traffic experimentally, and concluded that due to limited perceptual ability and physical coordination, children could not compete with adults in terms of traffic competence until nine years of age (Sandels, 1972). In the conclusion of his report Sandels calls for an expansion of the research effort concerning children's safety in the traffic environment.

Differences in the Spatial Range of Girls and Boys

In light of the findings by anthropologists, sociologists and geographers reported above, it might seem surprising to report that the discipline of psychology has little to offer to support, negate or add to the debate. A recent and very comprehensive review of the literature on the psychology of sex differences was only able to report the data of Newson and Newson described above (Maccoby and Jacklin, 1974). A major reason for the relative paucity of information on this subject has been the common tendency of child development investigators to ignore sex differences in their focussed search for developmental trends.

There is no biological basis for the different spatial activities of boys and girls. According to Tanner (1970), it is not until adolescence that boys become "more adapted for the tasks of hunting, fighting and manipulating all sorts of heavy objects" (p. 95) and even then, it is not clear how much this greater adaptability is the result of different childhood experiences.

Recently studies have been made of the activity level of boys and girls during the first year of life and in their summary of rather inconsistent findings, Maccoby and Jacklin conclude that the evidence suggests no sex differences during the first year of life. For greater insight, some psychologists have begun to look at the differential treatment of infant boys and girls. Such investigations are not straightforward for even during the first weeks of life it is not sufficient to simply observe different parental treatments as though spontaneous behaviors were identical. Moss for example found that even at three weeks of age boys were more irritable than the girls and hence were responded to more (Moss, 1967, cited in Maccoby and Jacklin, 1974). The boys' muscles were also stressed more and they received greater amounts of stimulation and arousal. Michael Lewis (1972) concludes that during the first two years of life mothers wean their boys away from maintaining physical contact with others, much more than with girls. He also found two year old boys more willing to venture further away from the mother. Unfortunately, such research is still at an early stage of development within psychology.

Studies of child-rearing, both by social psychologists and anthropologists, commonly use "restrictedness" versus "autonomy-granting" as one index of socialization practice. Surprisingly, in their excellent comprehensive review of the literature on sex differences, Maccoby and Jacklin (1974) concluded that "the bulk of evidence is that there is little or no difference in the socialization of boys and girls when it comes to independence-granting" (p. 319). They even report a tendency in the pre-school years towards a greater restriction of boys but note that the findings between studies are not consistent. Further evidence from these studies suggests that both mothers and fathers are more likely to follow up these restrictions with punishment for boys than they are for girls. Few of the studies reviewed by Maccoby and Jacklin included investigation of parental restrictions and punishments regarding spatial range, and then only as one question among many given to parents. Also, most of the studies relied on parental interview, and of those few which observed behavior, it was only for brief periods in the home or in a nursery school. Four studies not cited by them, and described above, have suggested significantly more liberal definitions of spatial range for boys than for girls.

In Tindal's study of the "home range" of second and fourth grade girls and boys in suburban and urban environments, boys' ranges were found to be significantly larger than those of girls. Furthermore, the home range of fourth grade (10 year old) boys over girls was proportionately larger than that of second grade (eight year old) boys over girls, suggesting that the sex-related differences in spatial range grow as children become older. In the study of child-training in rural Puerto Rico, David Landy (1957) had similar findings. On his scale of the restrictiveness of physical mobility based on ratings of interviews with mothers, he found girls to be more restricted. He also found that girls are "checked on" more frequently. The mother, usually responsible for caretaking of children, brings girls more quickly into line with the woman's role in the home than the mother or father does for boys. The two studies with Bantu-speaking societies in Kenya (Munroe and Munroe, 1971; Nerlove, Munroe and Munroe, 1971) employed a more direct measure of spatial range than either the child-reported actual "home ranges" of Tindal's study, or Landy's parent interviews; the children were observed in their natural setting around the village.

a total of 20 times, and their location recorded. Analysis of children's distances away from their respective homes, revealed a significant tendency for males to be farther away from home than their age-matched female counterparts. The male was rated as more distant from home on the average than the female. In addition, free time was found to be greater in boys.

In summarizing the state of our knowledge on sex differences in spatial behavior, it seems there is need for further study. There is sufficient evidence to question Maccoby and Jacklin's belief that no sex differences exist in independence granting. Maccoby and Jacklin were lead to their conclusion by the fact that most of the studies reviewed were of four to five year old children; this is easily the most studied group in child psychology, largely because it is the more accessible population for study! The studies by Tindal, and Munroe and Munroe, suggest a gradual increase in the boy-girl differences with age. Even a postscript comment by Maccoby and Jacklin points in this direction. In reporting the work of Newson and Newson on child-rearing in Nottingham, England, they note that although in their extensive research on four year olds no sex differences had been found in the range of movement inside and outside the home, personal communication with the authors had revealed that in the longitudinal study the girls, now seven years old, were being treated differently from the boys (Maccoby and Jacklin, 1974). They were receiving more "chaperonage," such as being met after school, than the boys. Their whereabouts must be known more than with the boys, and they are more often in the company of an adult. The suggestion by Maccoby and Jacklin is that the parents have a greater fear of molestation of the girls, and that this is an anticipation of further chaperonage in adolescence. But there are many possible alternative explanations for such sex-related differences. More research is required of children in their everyday settings of home and school before we can begin to explain the complex dynamics involved in such sex-role socialization.

APPENDIX A-2

REVIEW OF THEORY AND RESEARCH ON THE DEVELOPMENT OF CHILDREN'S PLACE KNOWLEDGE (1)

Much of this review is a condensation of a larger work by Gary Moore and myself (Hart and Moore, 1971). Serious readers should turn to this, particularly for a discussion of the epistemological foundations of the arguments presented below. They should also turn to subsequent discussions by Moore for the further elaboration of theory on spatial representation (Moore, 1973a, 1973b; 1976).

The review begins with a discussion of the relationship between place knowledge and spatial exploration, including a consideration of the motivational aspects of place learning. Following this, I found it necessary to make some conceptual clarifications and definitions before proceeding with the complicated academic language of place perception and knowledge. The review of the development of place perception is brief because it is largely completed during infancy and this study is focussed upon childhood beginning in the fourth year.

The discussion of the development of spatial knowledge begins with a consideration of the values of being able to internally (mentally) represent the spatial relationships of places. Before proceeding with the review of the development of spatial knowledge per se, the general theory of intellectual development of Jean Piaget and his colleagues is described. This theoretical position is emphasized because not only did Gary Moore and I find it the most comprehensive explanation of the development of spatial cognition, but it is also the one most suited to account for the large, dispersed and largely atheoretical literature on children's geographical orientation and representation of landscapes which follows it (2). The review closes with warnings against the naive universal application of Piaget's theory and a recognition of the importance of considering children's different environmental experiences. In this regard, consideration is given to the influence of socio-economic background and to the little-understood question of the differences between the spatial cognition of girls and boys.

Exploratory Behavior and Place Knowledge

Many of us recall the desire we had as children to explore the environment. There appears to be very little written on this subject. Froebel, the

1 A condensed summary of the development of children's place perception and knowledge may be found at the end of this review.

2 In our original review, Moore and I also used Heinz Werner's developmental theory (Werner, 1948). Because it follows Piaget in all important respects, it is not discussed here in the interest of brevity (see Hart and Moore, 1971, and Moore, 1973a).

Nineteenth Century educational philosopher, seemed more aware of this exploratory urge than most writers of children's behavior that have followed him (Froebel, 1826, trans. 1887). He sees the stage of "boyhood", beginning with school-entering age, to be more exploratory than that of the previous stage of childhood (1). Froebel goes on to suggest an explanation of this exploratory age:

It is not alone the desire to try and use his power that prompts the boy at this age to seek adventure high and low, far and wide, it is particularly the peculiarity and need of his unfolding innermost life, the desire to control the diversity of things, to see individual things in their connection with a whole, especially to bring near that which is remote, to comprehend (the outer world) in its extent, its diversity, its integrity; it is the desire to extend his scope step by step (p. 103).

What has psychology said about this subject since the time of this writing in 1826? As was noted above, there have been no investigations within the field of psychology of the spatial behavior of children in the macro-environment because this field has been concerned with general principles of behavior which, it believes, extend across all scales of environment (2). Furthermore, prior to the early 1850's psychologists had given very little attention to curiosity and exploratory behaviors. The interest lay instead with behaviors considered crucial for survival in organisms. Activity was explained in terms of movement that fulfilled specific needs such as hunger, thirst and sex. No doubt, even a child's activity pattern can be explained in part in terms of fulfilling specific needs, but many investigators came to realize that much of human behavior went beyond the maintenance of biological well-being. An area of psychological enquiry came into being which is now called curiosity and exploratory behavior (reviews by Dember and Earle, 1957; Barnett, 1958; White, 1959; Berlyne, 1960, 1966; Fowler, 1965). Even in the field of animal psychology, behaviorists were hard pressed to explain the tendency of animals to explore and learn about the environment for its own sake. It was known that animals in the wild become acquainted with the topography of a newly colonized area but it became particularly embarrassing to behaviorists when a series of latent learning experiments with rats demonstrated that the rats learned about their surroundings even when their obviously basic needs had been purposely sated.

1 Throughout his book, The Education of Man, Froebel refers largely to boys. This was common with most developmental summaries even until recent times. But in spite of the limitations of the historical and cultural context of his observations, Froebel's writing remains a most valuable source for insights into children's relationship with the physical world.

2 A possible exception to this is a paper prepared by Muchow in Germany in 1935 and referred to by Werner (1948). This paper is presently being translated by Howard Andrews, Department of Geography, University of Toronto.

Unfortunately, the relationship of such learning to exploration has been limited to experimental studies with rats; there has been no research of exploratory behavior and topographic learning in children. Nevertheless, some of the conclusions of the large body of literature on exploratory behavior over the past two decades may be relevant. Perhaps the most important suggestion is that exploration is carried out for its own sake, not merely to satisfy specific needs.

Berlyne(1966) has observed that novel, surprising and strange objects may provoke terror and flight instead of eliciting exploration (operationalized as "approach and sustained contact")(p. 30). Berlyne sees both responses as alternative ways of alleviating a disturbance due to a conflict-inducing sight or sound: by approaching, additional information may be obtained or relief may be avoided. Which of these two responses will prevail depends on many things, such as how disturbing the object or event is, how agitated or relaxed the subject is, and what personality traits he or she possesses.

Welker (1956) notes that reactions depend not only on the degree of novelty but also the spatial distribution of the novel or familiar stimuli and upon an animal's location with respect to this array. When familiar stimuli are present they act as a frame of reference or "home base" from which the exploration of small novelties may proceed. We may expect, therefore, that the relative familiarity and novelty of features and their spatial distribution are important elements in a child's exploration of the landscape. This has been empirically demonstrated in experiments by Rheingold (1969). Children of approximately ten years of age were observed in the strange environment of a small room during a series of four experiments. For the first experiment, the strange environment was empty; in the second, it contained toys; and in the third, it contained an unknown person. For a different group of infants in each experiment, the strange environment contained the subject's own mother. In the fourth experiment, the effects of all four conditions (empty, toys, person, and mother) were examined simultaneously with a separate group of children. Exploratory behavior was measured in terms of vocal behavior. Not surprisingly, the three strange environments had a distressing effect on the children, and reduced the extent of their exploration. This was true for the empty room, the room with toys, and the room with the stranger when the mother was present, however, even though the research design allowed for only a minimal amount of interaction, her infant showed no distress and explored freely. The addition to the strange environment of toys or another person, in the absence of the mother, failed to reduce stress or encourage exploration. It is possible that had Rheingold used toys or other physical objects of particular significance to each child, the results would have been different. Margaret Mead for example found with her daughter that the effects of travelling into a multitude of strange environments could always be relieved by the presence of her child's own potty, symbolizing continuity and security (Mead, 1966). Whether such a symbol would be sufficiently comforting to balance the strangeness of a bare white room is open to question. Rheingold concluded that the presence of the mother changed the strange environment into a novel environment, one which elicits exploration. It was further found that in some instances, prior exposure to the environment with the mother made the environment familiar, and reduced distress and supported exploration on subsequent entrances into the environment without the mother (except in the condition where a strange person was in the room). Acredolo (1976a) asks the question from this series of experiments--what made the environment

familiar to them? Was it landmarks they recognized? Did they have to move through the environment to learn it? These questions are being pursued in a series of experiments (Acredolo, 1976b and 1976c), to be discussed towards the end of this review.

According to Welker (1956) the horizon beyond an animal's home nest or region is gradually extended due to "mounting habituation of familiar elements of the nest" and "to the development of approach reactions to the more novel stimuli at the periphery of the home territory, such as stimuli becoming less novel with continued exposure and therefore eliciting less avoidance" (Welker, 1956, p. 186). Older, more experienced, animals are said not to be able to adapt to new surroundings as are younger animals. Welker claims there is a critical period in childhood for the occurrence of play and exploration during which the central nervous system is especially involved in acquiring knowledge about the external environment. After this period the organism attempts to maintain the organization it has achieved. It is not known to what extent these central nervous changes are experiential or maturational (Welker, 1956, p. 188). Shepard also argues that children, before puberty, are particularly concerned with acquiring knowledge of the physical world and demonstrate a much more sophisticated interest and knowledge of these things than of the world of human social phenomena. Such arguments are most interesting but cannot be described as anything but speculative at this time.

Exploration in human beings, is according to Berlyne, often "epistemic response" as well as an "exploratory response." This means that exploration is aimed not only at obtaining access to "information-bearing stimulation," capable of dispelling the uncertainties of the situation, but also as acquiring knowledge which can guide behavior on future occasions. Children's cognitive mapping of the surrounding environment would no doubt fall under this category. Berlyne regrets to note that the motivational aspects of epistemic behavior, and of thinking in particular, are only just beginning to receive study. For the time being, we may anticipate exploratory behavior to be an important vector in the set of forces which influence a child's spatial behavior, pushing outwards from the home, the center of his or her explored and known landscape, we may just as well turn to the insightful statements of Froebel, quoted above.

Some Conceptual Clarifications Concerning Place Perception and Cognition

In our review of the development of Spatial Cognition, Gary Moore and I found it necessary to define and conceptualize certain terms in order to clarify our position (Hart and Moore, 1971; see footnote below). This was necessary because in such expanding interdisciplinary fields as environmental behavior research, semantic confusion can quickly become overwhelming. This part of the review was found to be so valuable to us and to others that it is repeated in a condensed form here with only a few amendments.

First of all a distinction should be made between spatial cognition

1 The reader may also wish to turn to a subsequent, and very similar, review on the development of spatial cognition of large-scale environments by Siegel and White, 1975.

and spatial perception. Cognition, includes all of the modes of knowing, i.e. perceiving, thinking, imagining, reasoning, judging, and remembering. Place and space perception is given separate consideration in the following review because it has been studied separately by many scholars and because in early infancy the reflective aspects of knowing do not exist and perception does stand alone (Review by Bower, 1974). Perception is inextricably tied to the other modes of knowing in childhood however. Piaget and his followers (Piaget, 1963; Laurendeau & Pinard, 1970) suggest that knowledge of the world included two aspects: one of which is essentially figurative, related to the percepts one images of successive states or momentary configurations of the world by direct immediate contact, and a second which is essentially operative, related to the operations which intervene between successive states and by which the subject transforms parts of the world into reconstructable patterns or schemas. Visual perception is only one form of figurative knowing, while intelligence (or cognition) is based on the operative mode. As development proceeds, perception becomes subordinated to higher mental processes. Cognitive structures available to the organism influence perceptual selectivity which leads to a reconstruction of the world through selected fields of attention. Spatial perception and spatial cognition, therefore, are two separate but reciprocating processes (see reviews of spatial perception by Wohlwill, 1960; Howard & Templeton, 1966).

The terms spatial cognition and cognitive representation as used by leading developmental psychologists, encompass the more specific terms cognitive mapping and cognitive or mental maps used in the environmental behavior literature (e.g., Gould, 1966; Downs, 1968; Stea & Downs, 1970). Piaget and Inhelder (1967, p. 454) define "spatial concept" as "the fundamental idea of space," and "spatial representation" as the "symbolic and internalized mental reflection of spatial action." Similarly, the French-Canadian developmental psychologists Laurendeau and Pinard (1970, pp. 13-14) define "spatial representation" as "an implicit action which is carried out in thought on the symbolized object ... a mental reproduction (or) sketch of an object in thought."

Each of these theorists is referring to an internalized cognitive representation of space, as opposed to external representations such as children's drawings. It is helpful, therefore, to distinguish between external representations and internal or cognitive representations. We can only infer internal representations from external representations (e.g. drawings, maps, verbal reports, models, etc.) or from overt spatial behavior. Thus external representations are only of interest in this review to the degree that they shed light on the development of children's internal representation of space.

The commonly used (and sometimes misused) terms cognitive maps and cognitive mapping imply map-like representations of geographic or other large-scale environments. It is misleading, however, to suggest that spatial relations are necessarily represented in a cartographic form (Stea, 1969). Therefore, Moore and I chose to use the more inclusive terms of developmental psychology--spatial cognition and cognitive representation and macro-spatial cognition in order to distinguish between two different sets of research efforts: the study of the development of fundamental concepts of space on the one hand and the investigation of people's representations, of large-scale environments on the other. We hoped to show how these might be related to one

another. We did not mean to suggest that qualitatively different processes were involved (c.f. Acredolo, 1976a).

Various terms have been given to an individual's cognitive representation of the large-scale environment: "imaginary map" (Trowbridge, 1913), "field map" or cognitive map" (Tolman, 1945; Stea & Downs, 1970), "mental map" (Hallowell, 1955), "schema" (von Senden, 1960; Lee, 1964), "topographical schema" (Piaget, Inhelder & Szeminska, 1960), and "topographical representation" (Shemyakin, 1962). Moore and I chose the term topographical representation because it seems to be the most comprehensive and the least confusing: it implies neither a cartographic-like form (map), nor a habitual pattern (schema), but clearly refers to an internalized mental reflection of the physical environment. Shemyakin (1962, p. 193) satisfactorily defined it as "a mental plan of some area which is a reflection in man's mind of the spatial placement of local objects in relation to each other and to himself.

The term schema or schemata is reserved in this review for Piaget's use of it to refer to sequences of behavior, the basic building material of cognition. Related to topographical representation, geographic orientation refers to the way an individual determines his location in the environment. It utilizes a cognitive representation with a reference system relating it to the environment.

It is commonly assumed that learning, development, maturation and growth all mean approximately the same thing. While they are each associated with transformations in an organism, they are used more precisely here (c.f. Harris, 1957). Growth is a non-specific term generally implying any form of accretion. Maturation is more specific, implying physiological growth. It is more difficult to distinguish learning from development, a traditional controversy. Learning involves quantitative changes in the reception and retention of information or subject matter and refers to the situation where content is explicitly presented to the individual who changes through reacting to it and corrects initial attempts in response to indications about his prior successes (c.f. Hilgard and Bower, 1966). On the other hand, development implies qualitative structural changes in the organization of information or abilities and refers to the situation where the individual changes as a function of interaction between current organization and discrepancy with the environment (c.f. Werner, 1948; Piaget, 1963). The basic aims of the study of development are twofold; to describe the characteristic pattern of each level of organization, and to explain the relationship and transformation between these levels (Langer, 1970). Thus, theories of development are concerned with self-generating qualitative changes in structural organization, whereas theories of learning are concerned with quantitative accretion and decrement and the incorporation of specific content into structures.

The Development of Place Perception

This review of the development of perception is brief because perceptual development is virtually completed during infancy and hence falls outside of the primary focus of this study upon childhood beginning at four years of age. The review is also limited because remarkably little research

has been carried out on perception of large-scale environments. For reasons related to the history of psychology, I must rely largely upon laboratory studies with an emphasis on object perception rather than environmental perception (Ittelson, 1970). To this end, the review draws heavily from the excellent summary of theory and research by Bower (1974). A summary of normative developmental data on place perception may be found in Table A-1 at the end of this Appendix.

The primary sense in adults' perception of space (i.e., the perception of an organized three-dimensional space) is sight. Through this sense, we locate the distance of objects, determine their radial direction, to our right or to our left, and discover their height relative to our own. Perhaps because of the total insistence of the visual field in comparison to the other senses, we forget that these other senses do play a role in our space and place perception (see Schactel, 1959). Radial direction, for example, can also be picked-up by ear, and even by nose, though more crudely than by eyesight.

The fact that young infants turn away from unpleasant odors "smoothly and efficiently" in the correct direction even within the first days of life reveals that the capacity to locate approximate position with this sense is innate (Bower, 1974, p. 15). Auditory localization to right or to left is established by the end of the first year (Bower, 1974, pp. 19-33). Similarly, the precise "perceptual-motor mapping" of distance is not given innately, but is learnt during infancy; it is not possible to say when because the relevant experiments have not been carried out (Bower, 1974, pp. 64-96).

So much for children's ability to determine the location of objects, but how do children come to see objects as objects? The Gestalt psychologists gave much consideration to this question of object perception. They argued that there were many rules which we use to discriminate objects such as the "rule of common fate" whereby contours that move together along a common path are perceived as the single edge of a moving object (Bower, 1974, p. 101). It had been believed that these rules were innately given but it has recently been found that at least one of them, "proximity" (whereby in any visual array, the contours which are closer than average will be seen as contours of a single unit), develops very slowly in the infant's first year of life (Bower, 1974, p. 102).

Fantz (1961) found from one of his experiments with infants aged as young as four days, that they looked more often at a picture of a face than at a second scrambled picture of the same face or a third control picture with a large patch of black. From this he concluded that "there is an unlearned, primitive meaning in the form perception of infants" (Fantz, 1961, p. 71). He concludes from a variety of experiments that it is the pattern of an object - "the texture, the arrangement of details, the complexity of contours" - which is most interesting to children (Fantz, 1961, p. 71). This can be relied on for identification in diverse conditions whereas the color and brightness of objects change with distance; outline changes with point of view; and binocular depth perception is useful only at short ranges. In addition to the obvious value of such early pattern preference for the development of social responsiveness in an infant, it is also important in spatial orientation. Gibson (1969), for example, has shown that surface texture with a specific type of pattern

indicates whether an object is solid, air or water, and that changes in texture reveal whether a surface is vertical, horizontal or oblique, flat, curved or angular. In summary, it seems that infants have some innate capacity for form perception; the universe of early infancy has a measure of order and meaning. It is not a completely chaotic jumble of sensations.

Eleanor Gibson (1970, p. 106) concludes from her review of the experiments of perception that when we view the development of perception as an adaptive process, "nature" seems to have insured first the means of detecting the information needed for navigating through environments and avoiding dangers such as obstacles, pitfalls and approaching missiles. Discrimination of objects by simple signs based on single physical characteristics is also guaranteed early in development, but the fine-grain differentiation of multidimensional complex sets of objects is an adaptive process where adaptation is only achieved gradually through education.

In these various ways an infant comes to perceive a world of objects. This is just a beginning. A child now proceeds from a dependence on such immediate stimulus input to a combination of perceptual information with information from memory, from purely perceptual development to cognitive development. Piaget's theory and research reveals how cognition grows out of, and is intimately tied to, the development of perceptual activity in the first two years of life. For this reason the discussion of perception will be continued below. First, some consideration must be given to what the values of being able to mentally represent places in their spatial relationship to one another might be.

THE VALUES OF SPATIAL REPRESENTATION OF LANDSCAPES

Criticism might be made by some that there is an under-emphasis in this review upon children's ability to represent the spatial relationships of places, and not enough attention upon what has been called "existential space" or "lived space" (see Relph, 1970; Buttner, 1976; and Seamon, 1977). This under-emphasis is primarily because no writers to date have investigated lived-space empirically. Lived-space may be defined as the space of human intentionality. I accept the notion that our individual spatial worlds change according to our acts and intentions and that it is inadequate to describe an abstract world of spatial reflection. However, I also believe that there are some relatively consistent qualities to the manner with which people represent to themselves the spatial relationship of objects and places in their world, and that this mapping of the world has considerable practical importance to them. I believe Jean Piaget and his colleagues have demonstrated that children, within our culture at least, do develop the ability to abstract qualities of the geometric spatial relationship of phenomena and that this is important to their performance with the scientific and technical skills demanded by this culture. The mistake is to assume that such spatial cognition forms the whole of our spatial experience. It is important then, to remember that we live and act in space but we also need to frequently abstract ourselves from that being-in-the-world, in order to structure it so that we may more successfully locate ourselves and other phenomena within it.

One aspect of lived-space currently being investigated, through a series of phenomenological workshops, by geographer David Seamon, is the notion of a pre-conscious space of action based upon bodily movements and actions (Seamon, 1977). This is undoubtedly an important dimension of lived-space for much of our actions, including locomotion through environments, are carried out in a seemingly habitual manner without reflection. In the following review of Piaget's scheme of development it is important to remember that he is writing of the development of children's ability to reflect upon space. His sensorimotor space is equivalent to Seamon's "bodily lived-space." It is not lost to children once they become capable of reflection upon space in their second year of life; it remains the basic core of our being in the world. It is described as the first stage in Piaget's scheme, below.

The following review deals at a much greater length with the development of children's ability to spatially represent the environment than with their "lived experience" of space, simply because this reflects the state of the literature.

Representations of the landscape have at least two functions: first, to facilitate location and movement within the larger physical environment, and second, to provide a general frame of reference for understanding and relating with this environment. Recognizing the importance of the first of these functions as part of orientation, research psychologists have unwittingly been studying macro-spatial cognition for some time. The second function has been noted only recently but is equally important. For instance, Lynch (1960) suggests that "environmental images" help establish an emotionally safe relationship between people and their total environment by serving as organizers of activity and knowledge, as material for common memories which bind a group together, and as spatial referents for sense of familiarity. Belief in the importance of a spatial framework for these images is evident from the writing of Lynch and those who have followed him (Gulick, 1963; De Jonge, 1962; Stea & Downs, 1970; Appleyard, 1969, 1970; Wood, 1969, 1971).

Tuan (1974) describes five values of topographic representations: giving directions to a stranger; rehearsing spatial behavior mentally before going somewhere in order to guarantee successful arrival; memorizing the locations of places, things, or people; and for imagining alternative possibilities for action. As Kepes (1956, p. 18) explains it, "We make a map of our experience patterns, an inner model of the outer world, and we use this to organize our lives."

Piaget's Theory of Intellectual Development

The most extensive and comprehensive theory of the development of a child's understanding of spatial concepts is that of the Swiss genetic epistemologist and psychologist Jean Piaget and his colleagues. It is valuable to understand Piaget's theory of children's intellectual development before proceeding with the more specific questions of children's spatial concept formation and spatial cognition of the geographic scale environment. Only a brief summary of the theory and related findings of this prolific group is possible here (see instead Piaget, 1963, Piaget and Inhelder, 1967 and an extensive

review of his work on spatial concept formation in Hart and Moore (1971).

Piaget's basic epistemological position is constructivism. Instead of naively assuming that knowledge precisely copies what is real, this position argues that what we take to be real is in fact a construction of thought; a result of an unintentional act of knowing. He constructed a genetic epistemology--i.e. epistemology which would reveal the structure of knowledge empirically and developmentally rather than strictly philosophically. He believes that the problem of knowledge is resolved to an inherent interaction between the organism and its environment; all development is an interaction between maturation and socialization and between the organism and its environment.

Piaget argues that the motivation for all biological and psychological development is adaptation. Intelligence as one form of adaptation, involves development from lesser to higher orders of functioning. Although adaptation as a general concept is found in all living species, intelligence is not inherited, but it is formed through a complex interaction between the organism and its environment. Central to this theory is the ideal of the active organism. In strong contradiction to the assumption of behavioristic "learning" theories, that a child is a passive recipient of information from a "real" environment, Piaget's findings indicate that in adapting to its environment, an organism actively initiates, contacts and structures its experience. This intrinsic motivation is the impetus for moving toward higher level of equilibration. In addition we inherit a mode of intellectual functioning comprised of four functional invariants: adaptation, assimilation (the incorporation of the external world into already-structured schemas), accomodation (the readjustment of schemas to the external world), and equilibration (the coordination of assimilation and accomodation). These processes interact continually, according to Piaget, to provide a dynamic equilibrium. Assimilation never remains pure because in order to incorporate new elements, intelligence constantly modifies the schemata. Conversely, the things of "reality" which are taken in are never known purely because the work of accomodation is only possible as a function of the inverse process of assimilation (see Piaget, 1963),

On the basis of numerous experiments, Piaget identified four major periods in the development of intelligence: sensorimotor, preoperational, concrete operational, and formal operational. Each level is comprised on an organized totality of mutually dependent and reversible behavior sequences known as schemas (or schemata). Piaget utilizes four criteria to define a stage (Flavell, 1963). Each one must be:

- 1) qualitatively different from the one proceeding;
- 2) a hierarchic integration of all previous structures;
- 3) a coordinated whole;
- 4) reversible, i.e., any behavior which can be done must be able to be systematically undone.

Through dozens of experiments, he identified four major periods in the development of intelligence; sensorimotor, preoperational, concrete operational and formal operational (see Figure A-2-1). These general levels or periods are described in turn:

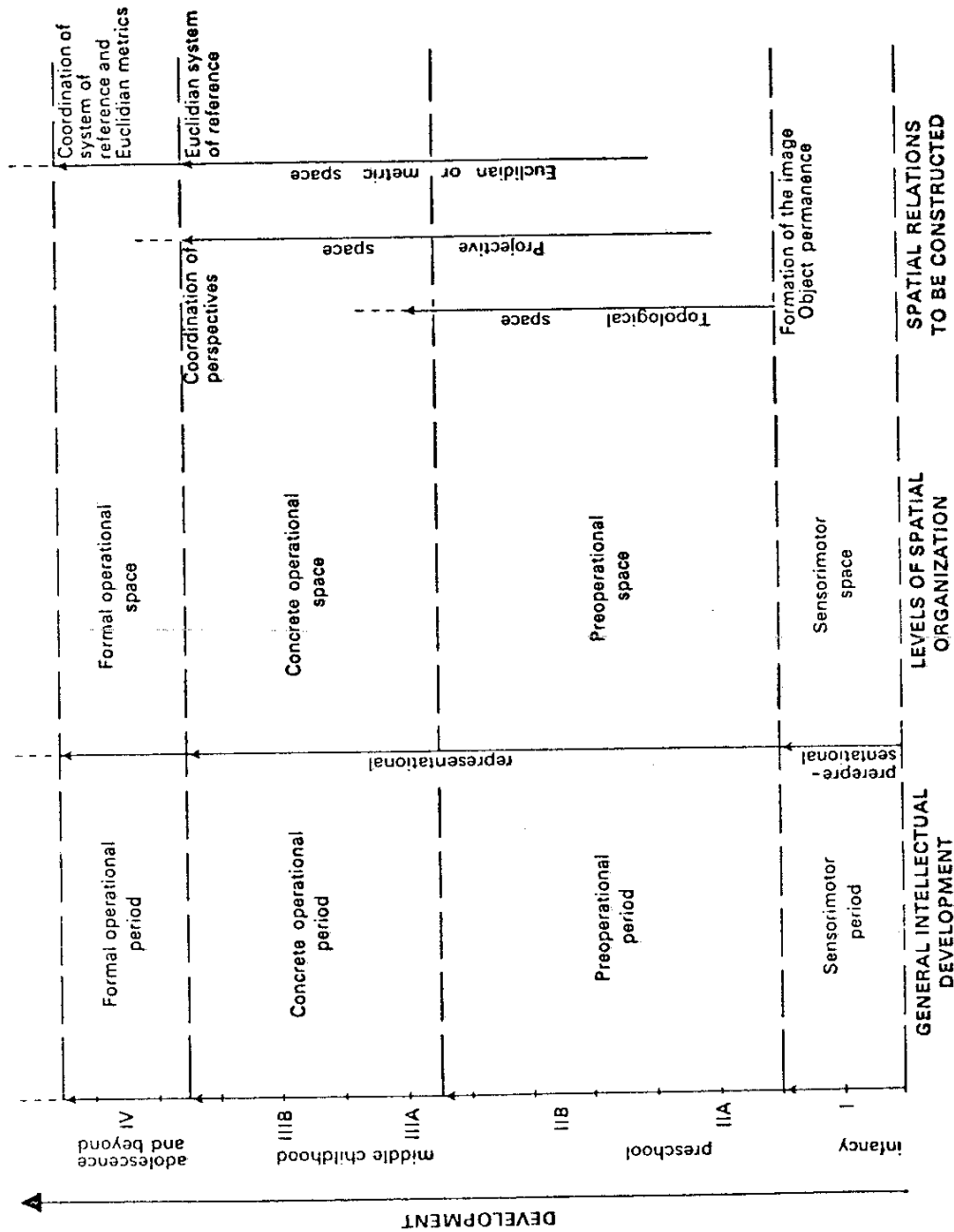


Figure A-2-1: Schematic Representation of Piaget's Theory of the Development of Spatial Understanding in Relation to Overall Intellectual Development (after Hart and Moore, 1971).

The Sensorimotor Period

During this stage a child develops from an organism capable only of reflex activity to an individual capable of coordinated actions and internalized thoughts. Only towards the end of this period does Piaget consider a child to be intelligent, and even then, this intelligence is tied to actions and the coordination of actions and does not involve internal representation. As will be elaborated below, all subsequent higher order thought patterns are reflective abstractions of such sensorimotor schemas, the "action" being carried out symbolically. Intelligence, for Piaget, is internalized action.

The Intuitive or Preoperational Period (approximately two to seven years)

Once a child is able to evoke mentally what has not actually been manipulated or perceived, he or she is able to "think" albeit at elementary levels. Towards the end of the sensorimotor period, a child becomes able to evoke mentally what has not actually been manipulated or perceived. This child can now represent the external world in terms of symbols and can begin to operate on them mentally, although operations at this level are only intuitive and partially coordinated. However by the end of the period he or she can "reverse" thought by starting again at the beginning (the concept of "reversability"). But this is a cyclical rather than a symmetrical or "true" reversibility. In addition, the thinking is egocentric: has difficulty in decentering from one aspect of a situation, focuses on particular states rather than on transformations, and fails to see the necessity of justifying assumptions.

The Concrete Operational Period (approximately seven to twelve years)

The achievement of this level is a decisive turning point in the development of intelligence. The intrusive constructions of the preoperational period become stabilized into higher forms of mental organization. A child is now capable of logical thought. But although it is now possible to make full use of reversible cognitive operations, these operations are still limited to real objects. However, as a result of this formation of reversible operations, a child no longer fuses or confuses his own viewpoint with that of others; but is now able to differentiate and coordinate different points of view independent of himself, such that the elements and relations are composable, associative and reversible. "Relational coordination" has now been achieved.

The Formal Operational Period

Thought in this period is no longer limited to concrete mental manipulation. A child is now able to operate on a strictly ideational plane with some kind of language such as words, mathematical symbols, diagrams, etc., without the support of perception or experience. Hypothetical-deductive propositions are now possible and classifications can be generalized to arrive at second and higher order classifications. This is the most advanced period in Piaget's theoretical framework of the structural qualities of intellectual development.

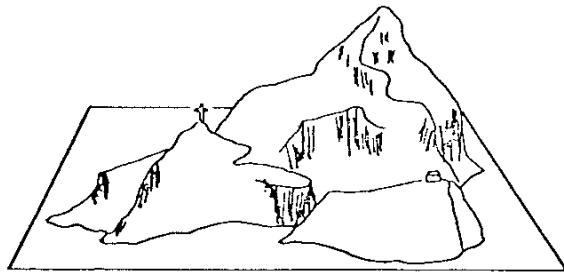
Children's Representation of Space According to Piaget

Piaget and his colleagues have devoted considerable attention to the problem of space (Piaget, 1954, 1962, 1963, 1976; Piaget & Inhelder, 1967; Piaget, Inhelder & Szeminska, 1960; Inhelder, 1965; for a review and replicative studies see Laurendeau & Pinard, 1970). The most important conclusion of relevance to this study is that the representation of space arises from the coordination and internalization of actions. Even our adult understanding and representation of space results from extensive manipulation of objects and from locomotions through physical environments, rather than from any immediate "reading" of this environment. This is a most important finding, for natural inclination is for us to assume that a child builds knowledge of the spatial organization of environments from perception alone, not from action. This conclusion is consistent with Piaget's distinction, discussed above, between figurative and operative aspects of knowing.

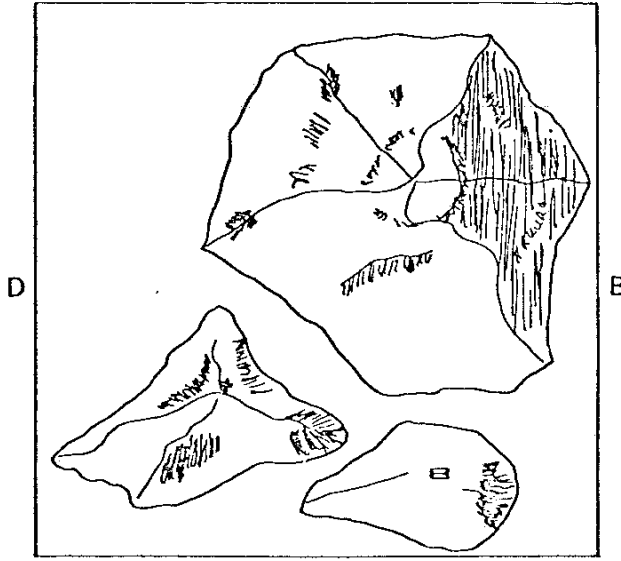
Piaget identified four levels or structures of spatial organization in relation to the four major periods of development described above: sensorimotor space, preoperational space, concrete operational space, and formal operational space (Figure A-2-1). Finally, Piaget found from many experiments (Piaget & Inhelder, 1967; Piaget, et al, 1960) that there are three classes of specific cognition: topological, projective, and euclidian or metric relations. Topological properties are simple qualitative relations like proximity and separation, open and closed, which remain invariant under continuous deformations excluding tears or overlaps. Projective properties are relations in terms of a particular perspective or point of view, e.g., a straight line, a triangle, or parallel lines, which remain invariant under projective or perspective transformation. Euclidian or metric properties of space are relations in a system of axes or coordinates whose equivalence depends on mathematical geometric equality, as, for example, an angle, and equal interval, or a distance. Ontogenetically, the understanding of topological relations precedes the understanding of projective and euclidian relations. The latter two develop in parallel, although the final equilibrium of euclidian relations is achieved slightly later than projective relations. These developments will be described in turn below beginning with a child's first experienced space: sensorimotor space. However, in order to exemplify this account with some of Piaget's empirical findings, three of his many experiments must first be described briefly. I have chosen to describe three which are particularly interesting to this review because they utilize model landscapes and landscape keys. The same points could have been made with some of his other experiments which use more abstract materials.

The Three Mountains Experiment

One very well known, fascinating, experiment involved the coordination of perspectives of three mountains (Piaget, 1967). A pasteboard of three mountains was shown to 100 children between the ages of four and 12. The mountains differed in size, location, color, and in the type of object at their summits (Figure A-2-2). A child is seated in front of the model at point A. A small wooden doll is placed alternatively at points B, C and D. After each placement, the child is shown a collection of ten pictures, each representing the mountains from different viewpoints, and is asked to select the picture which would correspond to the doll's view.



C



A

Figure A-2-2: The Three Mountains Experiment (after Piaget and Inhelder, 1967).

The Model Village Experiment

Three other experiments were conducted to explore the coordination of systems of reference. In each case Piaget and his colleagues asked children to set about making a plan or model of large-scale environments, in a sense externalizing "topographical schema" as he calls it (termed "topographical representation" by Gary Moore and me). These three experiments serve as a transition between Piaget's large number of experiments on the cognition of fundamental spatial relations and this investigation's focus on the large-scale environment. In one of the experiments, eight objects are placed on a blank cardboard base to form a model village (Figure A-2-3). The child is given another piece of blank cardboard and a larger set of village pieces from which to choose and arrange in the same way.

The Sand-Box Model School Experiment

Children aged between four and ten were asked to build in a sand-box, a model of their school buildings and environs, using a variety of wooden pieces and ribbons representing buildings, woods, rivers, etc.; to draw in the sand or on a piece of paper the route from school to a well-known landmark; to make a drawing of the sand model; and finally, to make necessary changes to the plan after the school building was rotated through 180° by the experimenter.

There have been numerous attempts by experimental psychologists to devalue Piaget's experimental methodology. Laurendeau and Pinard, who have carried out the most comprehensive replicative work of Piaget's experiments, cogently answer such criticisms:

We believe that the value of an experimental method is measured not by the abundance or subtlety of the statistical analyses it may favor but by the richness of the information it provides or the new hypotheses it suggests. In this respect, it would be futile to make any comparisons between Piaget's synthesis and the rather fragmentary studies which are currently flooding the journals (Laurendeau and Pinard, 1970, p. 19).

Laurendeau and Pinard have replicated five of the most central of Piaget & Inhelder's experiments on space, paying attention to standardization of the experimental materials and conditions, and to the formation of subject groups which are representative of the general population (Laurendeau and Pinard, 1970). Having described the experiments it is now possible to describe how children of the four different intellectual levels of ability do operate upon them.

Sensorimotor Space

During this period, an infant moves in a space of action. This sensorimotor space is pre-representational, lacking the symbolic function which facilitates imagination and reconstruction. Orientation to the environment

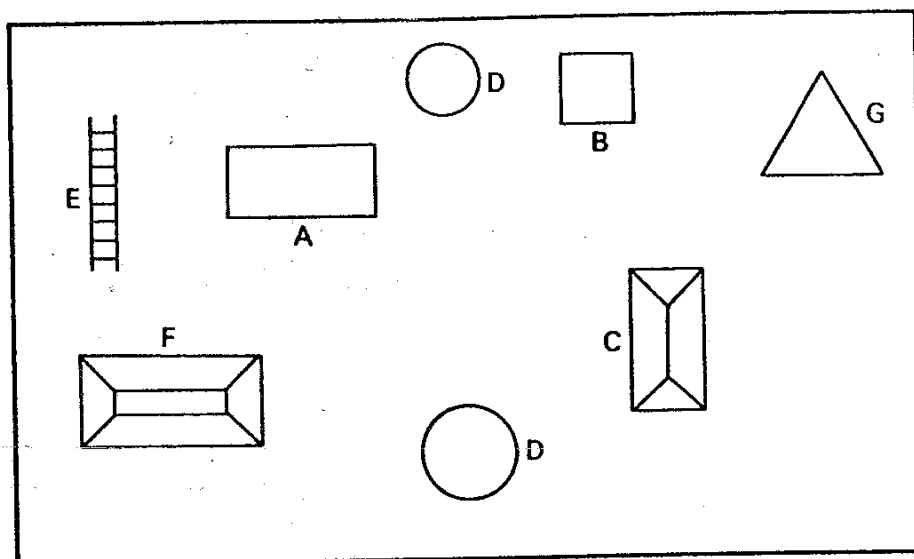


Figure A-2-3: Model village used in Piaget and Inhelder's experiment on the coordination of systems of reference and euclidian metrics (after Piaget & Inhelder, 1967).

is entirely egocentric. Piaget describes four simultaneous developments during this period:

1. The Genesis of the Image

This arises from the internalization of deferred imitations. Initially, the sensorimotor child copies or imitates other people's actions. Subsequently, as this imitation schema is internalized, and hence able to be deferred, the response becomes symbolic. A note on imagery is worthwhile here, for it is commonly held that this is derived from visual perception (e.g. Bruner, 1966, p. 21). This view contrasts markedly with Piaget's (1969) findings that imagery is an active schematizing reproduction. It is true that there is a resemblance between imagery and perception but this is according to Piaget and Inhelder (1967, p. 68), due to imitation: imagery "actively copies" perceptual data. Piaget, Inhelder & Szeminska (1960, p. 12) suggest that:

Our own comings and goings provide the framework for our memory images of districts and landscapes. Indeed, examples such as these provide the best proof that visual images are internal imitations of actions, the objects being imagined, and the actions internalized.

2. The Formation of Object Permanence

This is commonly called the development of the "object concept" and is to be distinguished from the development of "object relations" (to be described in Appendix A-3, below). At birth and during the first year, when an object is removed from its immediate sight, an infant believes that the object ceases to exist. Slowly, through playing with objects, this infant will come to realize that an object still exists even if temporarily hidden. In this way a conception of objects develops which transcends perceptual or tactual stimuli.

3. The Achievement of a Coordinated Space of Action

By the end of the sensorimotor period, an infant has developed from acting in a series of separate spaces centered on different personal needs and body parts, e.g., postural space, buccal space, tactile space, auditory space, and perceptual space, to moving in a single coordinated space within which all objects are interrelated. A child should now be able to move freely and confidently through a limited spatial terrain - for example, he or she can take shortcuts over routes (combination), return to a point of origin (reversibility), and detour around an object in order to get to another place (associativity), but it must be remembered that all of these are at the level of action, not knowledge. It is worthwhile to quote from Cassirer, another well known constructivist who has given a considerable amount of attention to our conception of space. He distinguishes clearly between concrete acquaintance with, and abstract knowledge of space:

Here we grasp very distinctly the difference between the concrete and the abstract apprehension of space and spatial relations. . . . Acquaintance means only presentation; knowledge includes and presupposes representation. The representation of an object is quite a different act from the mere handling of the object. The later demands nothing but a definite series of actions. . . . But the representations of space and spatial relations means . . . we must have a general conception of the object, and regard it from different angles in order to find its relations to other objects. . . and determine its position in a general system. (Cassirer, 1944, p. 46, underlining added).

Nevertheless, as will be shown below, the sensorimotor period is essential to the development of spatial knowledge. It forms the basis for all subsequent developments of spatial knowledge in the following three periods. All of them depend upon the internalization and reflected abstraction of sensorimotor schemas (for an excellent discussion of the sensorimotor basis of spatial knowledge, see Chapter One of Gerhardt, 1973).

Intuitive or Preoperational Space

In order for representational space to develop in a child, the obstacles already overcome with the equilibrium of sensorimotor space must now be recognized on the level of symbolic representation. There are two substages: IIA, symbolic and preconceptual thought (from two to about seven years), and IIB, intuitive, partially regulated thought (from four to seven or eight years).

During the first substage, a child's representations of space are still linked to sensorimotor activity and merely evoke successive states that have already been carried out on manipulated or perceived objects (Laurendeau & Pinard, 1970). As with preoperational thought in general, a preschool child cannot reverse thought and hence can only return to a point of origin in thought by tracing a cyclical route. The topographic representations during this period are egocentric, that is, the child's conception of space is still tied to his own point of view, although some beginning moves are made in the direction of decentering. This is clearly exemplified in the "three mountain experiment." The children select the picture corresponding to their own. Even when they had the chance to check their selection by going around to the doll's position to look they would not change their mind.

A more complete picture of the problem of topographic representation is provided by the "model village" experiment. During the first preoperational period substage IIA (until four years) a child is unable to arrange the village pieces in any systematic way. During the middle part of this period (IIA-IIB: four to six years), a child picks out the correct number and type of pieces, and tries to locate them in similar positions, although he or she is very unsuccessful; distances as well as perspective relationships are ignored, and

there is no coordination between the arrangements of objects and the external reference system provided by the card they lie on. Finally in substage IIB proper (five to seven years) certain sets of relations are constructed in an intuitive manner, although they are not intercoordinated.

In the "sand-box experiment," an action-centered, egocentric, reference system was utilized by the children of preoperational level. Representation occurred only when they thought out a route. Landmarks were mentioned by these children, but were simply "tacked on" to recollections of their own actions, that is, the routes they had traversed. Children of this level can anticipate the spatial relations between one landmark and the next when they are walking and when reproducing this route on paper, but they cannot mentally reverse their knowledge of this route. Consequently, children of even the preoperational period can represent pairs of neighboring objects topologically, but they cannot organize three or more objects successfully into a coordinate system. This must await the arrival of the concrete operational period.

Concrete Operational Space (Stage III)

Piaget found that somewhere around the age of seven thought can finally disengage itself from images; it is transformed into operations which are, however, still concrete, that is dependent on the presence of real or represented objects. The spatial structures, become fully mobile, flexible and reversible. Through a logical coordination of space from multiple viewpoints, children are now capable of achieving a considerable degree of abstraction. Thus, they are finally free from an egocentric orientation toward space.

It should be noted that throughout this summary Piaget's stress upon children's achievement of an abstract understanding of spatial relationships is simply an account of the development of ability. I do not wish to suggest here that this is a comprehensive account of how children represent space. It excludes, for instance, the kinds of personal subjective aspects of space representation found by Muchow and Muchow (1935) in their study of the "life-space" of 100 nine to 14 year olds in a section of Hamburg, Germany (1). After asking the children to outline a map, places which they knew well and knew superficially, they concluded that:

Space ends where the child's activities end . . .
near and far are also defined functionally and
not geographically e.g. 'far' is across the street
but 'near' may be a playground some distance from
the home street, but in 'psychological perspective,'
close by. (Description of the study by Werner,
1948, p. 386).

1 This study, long inaccessible to English-speaking readers, is being translated by Howard Andrews of the Department of Geography, University of Toronto, and will shortly be available.

Using the "three mountain experiment" as an example, Piaget found during substage IIIA (seven to nine years) that a progressive differentiation of points of view and certain projective relations were formed. First, before and behind are correctly differentiated. Soon after, left and right are differentiated. It is not until the final equilibrium of concrete operations (IIIB: around nine or ten years) however, that the two schemas are intercoordinated and a child can master a comprehensive coordination of viewpoints completely independent of his or her point of view. These findings may be explained in terms of the developmental shift from egocentrism to relational coordination and the equilibrium of fully reversible concrete operations, through which a child is able to completely decenter from his or her point of view, and to integrate the set into a coordination or equilibration of perspectives.

Similarly, in the "model village experiment" a system of reference can be constructed with the onset of concrete operations (IIIA: seven to eight years), but this does not become stabilized until concrete operations reaches an equilibrium with children of substage IIIB (nine to 11 years). The final equilibrium of a truly abstract understanding of the coordination of projective and metric properties of space into a stable system of reference awaits the development of formal thought. For early concrete operational children (IIIA), the representation of the model school environment could be partially coordinated with the use of landmarks. The children were, however, unable to coordinate the system as a whole, either in demonstrating the topographical relations between landmarks with wooden models, or in describing a route. They could relate objects to each other in discrete local areas, but they could not appreciate the totality of relations between landmarks which occur in the environment because the landmarks were fixed in partially coordinated subgroups, each based on an independent vantage point or on a particular journey.

Finally, Piaget and his colleagues (Piaget et al., 1960) also found that the conservation of length and surface are not achieved until concrete operations, when the child discovers, through reversibility of thought that a quantity has remained the same although a transformation had occurred. These conservations are required for final equilibration of a fully coordinated and abstracted space (Piaget et al., 1960, pp. 389-408).

Formal Operational Space (Stage IV)

The final development in a child's conception of spatial relations in Piaget's scheme, is euclidian or metric space. Children at this level of development are able to build the "model village" and the "sand-box school environment" taking into account the projective and euclidian relations of proportional reduction to scale, accuracy of distance, and metric coordinates. Piaget describes the importance of a system of reference for the organization of such spaces:

It is due to the spontaneous construction of a network that figures can be oriented and movements directed in space. . . . However, a reference frame is not simply a network composed of relations of order between the various objects themselves It applies

equally to positions within the network as to objects occupying any of these positions and enables the relations between them to be maintained invariant, independent of potential displacement of the objects. Thus a frame of reference constitutes a euclidean space after the fashion of a container, relatively independent of the mobile objects, potential viewpoints includes each viewpoint actually envisaged. (Piaget & Inhelder, 1967, p. 367)

Once a child becomes capable of operating on spatial relations completely removed for any actions upon phenomena in space, he or she can enter into formal operational space - a space of ideas with a multitude of spatial possibilities. Particularly important in these developments is the role of language: "language enables thought to range over vast stretches of time and space, liberating it from the immediate" (Piaget & Inhelder, 1967, p. 86).

Piaget and Inhelder have noted that "thought, particularly through language, can represent simultaneously all the elements of an organized structure" (1967, p. 86). In contrast, Arnheim, in discussing visual thinking, believes that intellectual thought as mediated by language "strings perceptual concepts in linear succession" and "dismantles the simultaneity of spatial structure" (Arnheim, 1970, p. 247). This argument cannot be reasonably pursued in this brief review. Suffice it to say that spatial representation depends neither upon language nor imagery alone, for the gradual development of the child's freedom from his or her own actions, which has been described above, depends on representations that utilize a whole range of symbolic functions. Language, however, plays a particular role in the achievement of abstract space in this formal operational period. It is clearly important in enabling children to produce new structures based on rules. Such an ability is undoubtedly important in facilitating children's representations of unfamiliar environments through the application of previously learned rules about the structure of landscapes.

Children's Orientation in, and Representation of, Landscapes

In attempting to integrate the dispersed and largely atheoretical, literature on geographical orientation, Moore and I identified three reference systems which develop sequentially in a child. A reference system is essential to any workable topographic representation. It spatially orients an individual in some systematic manner to the environment. We used the terms egocentric, fixed, and coordinated to be the three systems of orientation. Our thinking was strongly influenced by an early, remarkably insightful paper by Freeman (1916) and by Piaget and his colleagues who we considered offered the only comprehensive account of the development of children's spatial knowledge. The relationship of the three systems of reference to Piaget's developmental scheme is illustrated in Figure A-2-4. They are graphically summarized in Figure A-2-5. As will be seen, the three systems of influence are believed to develop sequentially. For this reason, they are described in this manner below.

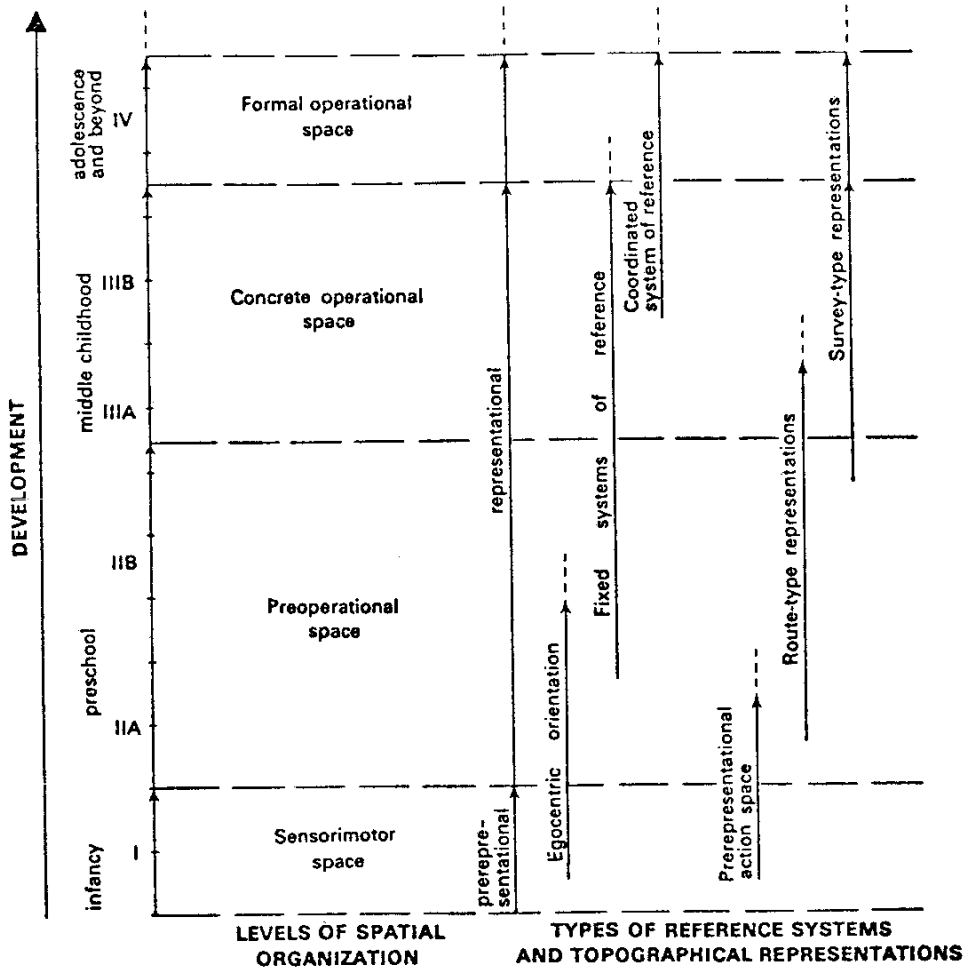


Figure A-2-4: Schematic representation of the development of geographical orientation and topological representations.

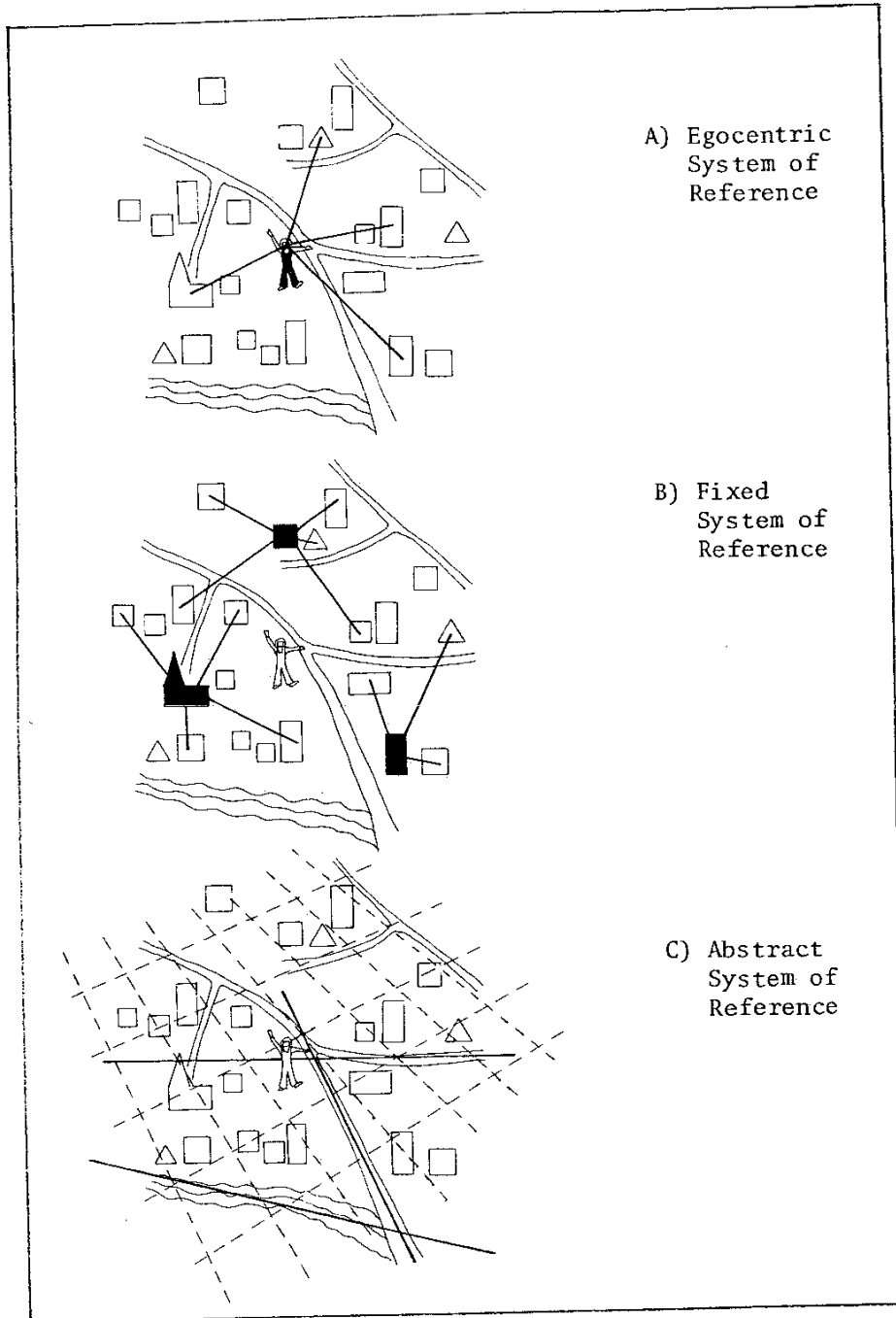


Figure A-2-5: Children's Orientation in the Landscape

Egocentric System of Reference

Geographical orientation (like all development) is initially action-centered and egocentric. Numerous experiments have illustrated the effectiveness in people of a sensory system based primarily on proprioceptive input for the perception of body position (see reviews Howard & Templeton, 1966, pp. 272-293). Some of this large body of literature demonstrates how a child first orients to the physical environment using axes or planes defined entirely with respect to his or her body. This may be referred to as an egocentric orientation system. There is much evidence that this system is based on a sense of localization through bodily movements (Howard & Templeton, 1966). Freeman suggested that the direction to a place (present or imagined; Ryan and Ryan, 1940) is "represented in the mind" in terms of movement of the body through turning the head or pointing, both of which bring us into alignment with the place.

The process begins, according to Freeman, when a child hears a sound behind her or him and turns towards it in order to localize it. This conclusion was also reached after experiments by Boshurova and Golubaya (described in a review of Russian research by Shemyakin, 1962). Freeman goes on to suggest that the localization of sound is followed by the child imagining the source of the sound without looking around. This in turn causes her or him to imagine the location of other objects which are out of the range of vision, without turning around to see them. This development does not seem to have been suggested elsewhere but is a logical extension of the large amount of literature on the importance of localization through body movement. Through this method, Freeman believed a preschool child of four to five years of age builds up a "fairly definite notion of the direction of buildings or streets in the immediate vicinity of his home" (Freeman, 1916, p. 164; and Ryan and Ryan, 1940). This suggestion accords with Piaget's description of preoperational visual images as "internal imitations of actions, the objects being imagined and the actions internalized" (Piaget et al., 1960, p. 12). But what of larger areas where the landscapes must be traversed by the individual? It is not enough for a child to imagine movements; movements must be linked to reference points. It was for this reason that, in the sand-box modelling experiment, described above, Piaget found that children could only anticipate the spatial relations between one landmark and the next. They could not arrange three or more objects successfully into a system. Based upon a review of Russian empirical findings, Shemyakin (1962) describes the development of topographical representation in a similar manner to that of Piaget. He distinguishes two fundamentally different types of topographical representation: route-maps and survey-maps. A route-map is described as a representation constructed by mentally "tracing the route" of locomotion through an area (Shemyakin, 1962, p. 218). This agrees with Piaget's account in the "sand-box experiment" (described above) of how children represented their school environment in the form of known routes; they are the child's internalized actions. A "survey-map" is described by Shemyakin as a representation of "the general configuration of schema of the mutual disposition of local objects" (Shemyakin, 1962, P. 218). We considered this equivalent to what Piaget describes as a true topographical representation utilizing a coordinate reference system.

Shemyakin suggests from his own empirical work and that of others, that route-map representations are a necessary prior development in the forma-

tion of survey-map representations. He argues that after a child learns to walk, a new stage in the understanding of space relations opens before him or her. He cites Lyublinskaya's description of a one to one and a half year old child's early mastery of the "space of the route" (Lyublinskaya, 1948 and 1956; reviewed in Shemyakin, 1962). Lyublinskaya also observed that in, and immediately around the house, "the child is not only able to orient herself in space among familiar objects, but also retains a pretty accurate representation of the position of individual familiar objects in space" (Shemyakin, 1962, p. 218). Shemyakin's review concludes that even children of six to eight years of age, when asked to draw a plan of some locality familiar to them, did so mainly by drawing the route. Assuming a correspondence between the construction of these external representations and the initial development of internal representations, he observed that:

Children usually began their work at the lower edge of the paper, and drew "away from themselves" (so) that the right and left turns coincided with the real position of their body in space. . . asking them to draw away from themselves led to a sharp increase in the number of errors in the reproduction of (the) turns. (Shemyakin, 1962, p. 219)

Furthermore, some children chose to sit at the side of the table which faced the required locality, again clearly indicating an egocentric preoperational level of development.

It is useful to note here that route-mapping is not unique to children (e.g. Appleyard, 1969 and Rand, 1969). It is found in adults and may be a stylistic difference or a developmental question of how long someone has had to experience a particular landscape (see review in Moore, 1973a).

Fixed System of Reference

For orientation in large-scale environments, Freeman (1916) noted the importance of a child's ability to free the self from the limitations of the early egocentric orientation system. After a child has used the egocentric process of localizing places when occupying various positions among places, she/he builds up a notion of their directions and distances with reference to one another, which does not depend upon his or her position in the group. Following this stage, the child learns to relate "different positions or directions with reference to the position of some fixed object or of some fixed direction" (Freeman, 1916, p. 170). A child thereby achieves a "detached view of a region as though it were seen from a distance" (Freeman, 1916, p. 165). This development, according to Piaget (1963a) begins, with the onset of reversible thought in the concrete operational period. At this stage, Piaget et al. (1960) have shown that a child begins to orient in terms of fixed elements in the environment, rather than rely entirely upon orientation to the self. We therefore chose to call this the fixed system of reference. It is important to remember that Piaget found in the "sand-box experiment," that both independent vantage points and routes were found by children to be a suitable basis for their representations of the school environment. Von Senden's summary of clinical observations of orientation

by the blind suggests the value of such fixed reference points in serving as locii for exploration:

The subject sets out from a perfectly definite central point, resembling the center of a spider's web, whence he gains acquaintance with the routes that matter to him, up to an outer periphery that can be more or less gradually extended. Wherever he may be, he always remains mentally in conscious relation to his fixed starting point (1960, p. 286).

Trowbridge had earlier provided an account of the efficacy of such a system, as a way for the orientation of birds, beasts, fish and insects, etc.: "All changes of position . . . can be referred at any moment to definite distances and angles, forming a simple trigonometric figure which gives the direction to the home" (Trowbridge, 1913, p. 890). He argued that this "domocentric" system (which may be seen as a special case of fixed reference systems) is also found in "uncivilized man" and young children, for orientation was once thought to be an innate ability which remained as a vestigial sense in children. Although domocentric orientation is not innate, children do seem to commonly orient themselves towards their home. In an aerial geography experiment, I observed that children (aged eight to nine years) would not become involved in a geographical learning experience provided by flying and aerial photographs until they had first located their home or their school (Hart, 1971). Lee (1963) and Rand (1969) offered similar conclusions on domocentricity from observations of children's drawings and their behavior with regard to home and school. Unfortunately, however, there is still very little known about fixed systems of reference. Most research on the development of orientation in children has been concerned with children's understanding of the cardinal directions, even though orientation to fixed familiar features would seem from the above analysis to be more likely for preoperational and concrete operational children. In fact, Lee (1963, p. 25) doubts that even adults construct a rectilinear grid of coordinates to orient themselves in space; he suggests instead that in each of their "spatial schemata" they use a "polar" system consisting of a set of radiating lines from a fixed reference point. How the topographical representations themselves develop a fixed system of reference is a question which has been given little attention in the literature. Given that the representation of space begins with the internalization of action on space, we might anticipate that walking or cycling would be most important to the child's formation of topographical representations and that more passive modes of travel would not serve the same purpose. This point has been suggested in a fascinating study by Lee (1964) of the effects of children being bused to school who had previously been able to walk each morning. Lee explains that walking is "intimate to the environment and therefore articulates the schema." The hypothesis is supported by research findings on the role of kinesthetic cues in geographical orientation (see Howard & Templeton, 1966). As a result, Lee (1964, p. 25) found that the spatial world of primary school children in England was divided into various local "schemata" which bore a "detectable relationship to the physical world," but that "beyond this home area lay one total schema that might be called the 'elsewhere schema' in which physical dimensions were irrelevant (Lee, 1963, p. 25). Rand (1969) makes a similar conclusion and goes on to further argue that a deep sense of familiarity with the home area is necessary as a basis for further exploration

and, drawing from Eliade (1959), discusses the notion of home as a "sacred space" from which a child makes "brief excursions into the profane world" (Rand, 1969, p. 79). This seems sufficiently obvious to be a truism, but such statements are understandable: not only has their been little research into the development of topographical representation in children but, as was shown in Appendix A-1, there have been very few studies of children's spatial behavior in their home environment.

Blaut and Stea have hypothesized that children may have another means that directs locomotion through landscapes available to them in their play learning. Through a program of research on "place perception" they carried out a series of studies concerning children's abilities to interpret features on aerial photographs and to navigate across these simulated landscapes (Blaut, 1969; Blaut and Stea, 1969, 1971; Stea and Blaut, 1973a, 1973b). They concluded that children are able to carry out the fundamental process of map use on these "iconic maps" years before being exposed to conventional maps. They hypothesize that children may have become familiar with these processes of rotation in perspective, reduction in scale, and abstraction to iconic signs through their play with toys on the ground. They argue that this play is map-ping. If this does result in place learning, then children do have a most valuable supplement to direct locomotion through landscapes.

In summary, it seems that during what Piaget has termed the preoperational period, a child graduates from an entirely egocentric system of reference to a fixed one centered first perhaps on the home (domocentric) and later on a small number of uncoordinated routes, landmarks and familiar places. These differentiated, but uncoordinated, representations of the environment begin to be coordinated with the onset of concrete operations.

Coordinated System of Reference

As Shemyakin (1962, p. 190) expressed it, "the crux of the general development of the understanding of space is the transition from a (fixed) point of reading to a system with a 'freely transferable' point of reading." Unfortunately, with the exception of the work of Piaget and his colleagues, all work on the coordinated abstract systems of reference used by children has been totally concerned with children's understanding of cardinal directions. While a knowledge of cardinal directions is important for the understanding of published maps and for the public communication of directions, it is not necessary in the formation of a person's topographical representations of large scale environments. For example, none of the four to ten year old children in the "sand-box model" school experiment described earlier in this review, were reported to have utilized the cardinal directions in constructing their models (Piaget et al., 1960). This experiment, and the "model village" experiment, did demonstrate however that children who had achieved the equilibration of concrete operations (substage IIIB) did utilize a two-dimensional coordinate system. These were not necessarily similar to a cartographic grid with parallel line. The coordinates were instead based upon physical features in the experienced environment, but they nevertheless serve the purpose of enabling a child to produce a model which is a coordinated whole (Piaget, et al., 1960). In drawing a plan of the school area, Piaget found that children of this advanced level use two complementary methods: either they group together the elements of the plan in terms

of relations between local areas, or they select one or more common starting points and reconstruct routes which radiate from them. They are then able to relate them all to each other through the advanced logical abilities found at this level of development. Through "associativity," each point can be reached mentally by any one of a variety of routes, and, through "reversibility," each route can be represented in the reverse direction to that experienced. A child is finally able to produce a fully coordinated topographical representation when he or she can decenter from each of the partially coordinated fixed systems of reference. These are then intercoordinated, through the processes of "reciprocal assimilation" and "reflective abstraction." A child's individual route-type topographical representations become coordinated into a comprehensive survey-type representation. This represents the close of substage IIIB, the achievement of fully equilibrated concrete operations. But how is an abstract system of reference applied to environments so that an individual may use it for navigation?

Trowbridge (1913), suggested that an individual uses reference points on the horizon corresponding to the cardinal directions. As the lines from these points always intersect at the ego (self), he called this an "egocentric" system of orientation. Moore and I found this use of the term confusing, for the ultimate point-of-reference for all orientation is necessarily the perceiving individual. Nevertheless, something like what Trowbridge described must exist for all those who utilize the cardinal directions. Lord (1941) measured the orientation abilities of 317 children in the later elementary grades (ten to 14 years) by asking them to point to the cardinal directions, distant cities, and nearby places, and to draw sketch maps of the spatial arrangement of local cities, villages, and features within a familiar city. He concluded that children have two frames of reference: a "conventional map frame" for distant places, using the cardinal directions (abstract system) and a "direct experience frame" for relatively nearby places (fixed system). In this way he explained how, through the simultaneous use of the two systems, a child may locate two places, one distant and one nearby, in directions which are markedly inconsistent with each other.

Finally, it should be noted that a coordinated abstract system of reference is probably not a universal phenomenon. Reviews by Werner (1948), Hallowell (1955) and Lynch (1960, pp. 123-139) find that such a system is not true of all cultures. The possibility that the achievement of an abstract understanding of spatial relationships is related to socio-economic rather than cultural factors is discussed in a later section of this review.

In order to determine the validity of our suggested three-stage developmental account of reference systems, Linda Acredolo designed two experiments with three, four and ten year old children. She studied their orientation in large-scale spaces rather than on miniature model environments because of the hypothesized importance of children's locomotion through environment (Acredolo, 1974, 1976b). The findings offer some support for our hypothesized sequence of development. The children of three years of age relied upon the egocentric system of orientation in one of the experiments which used a large room, but in the other, where the room was only seven feet by 12 and a half feet, they did not need to rely upon this system. Acredolo hypothesizes that this is because the room was smaller hence easier to master; the explanation for this remains to be discovered. Both experiments revealed the importance among the majority of the

pre-school children (aged three and four) of a fixed frame of reference using landmarks. These children relied upon the concrete "contained" objects of the environment, not on some abstract conception of the container itself - i.e. the shell of the room. In contrast, the ten year olds of the study showed no tendency to rely upon objects (fixed reference system) for they were all able to use our hypothesized third level of reference system described in Acredolo's study as a "container" reference system. This does not mean to say that in more complex environments they would not revert to a fixed system of reference, it simply means that they are able to use an abstract system in a room, where younger children are not.

Socio-Economic and Cultural Bias in Piaget's Theory of Cognitive Development

It has already been noted that the greater majority of work on children's place knowledge has been concerned with their knowledge of the location of places, that is, the spatial organization of the landscape. In contrast to this, remarkably little attention has been given to children's knowledge of places themselves. Instead of asking what places children know and what they know about them, researchers have asked only about the abstract structures which hold these places together. It is worth inquiring here why this should be the case.

As has been shown, the most comprehensive work on children's cognitive development has been carried out by Piaget and his colleagues. In his work, Piaget focussed entirely upon the development of children's abstract thought. As Vygotsky (1962) expresses it: "Once he has separated need and pleasure from adaptation to reality, logic forces Piaget to present realistic thought as standing apart from concrete needs, interests and wishes, as 'pure thought' whose function is the search for truth exclusively for its own sake" (Vygotsky, 1962, p. 22). Some writers have argued that Piaget's developmental sequence is not universal but is subject to the difficult cultural and environmental variables found in other societies (see Price-Williams, 1969). Susan Buck-Morss argues more fundamentally that Piaget's emphasis on abstract thought is a direct reflection of the general logical structure in western industrialized countries of "abstract formalism" (Buck-Morss, 1975, see footnote below). This is based on the premise of a duality between cognition and society. Extracting from the writing of Lukács (1971) she argues that "the separation of formal mental operations from the perceptual objects which provided the content of thought, was the cognitive counterpart to the alienation of workers from the object of their production" (Lukács, 1971, pp. 110-149). Buck-Morss argues then that the achievement of Piaget's stages reflects a particular socio-economic structure. She finds no problem with the first, sensorimotor, period of development for in this period cognition is clearly tied to content. Her criticism is that "he presupposes that the most important thing is not so much what the child can do

1 No page references can be given for the quotations from Susan Buck-Morss' article because only a draft copy was available at the time of writing.

in this concrete world, as to how quickly he can do without it" (Buck-Morss, 1975). For her, an infant's ability to separate subject from object ("object performance") is the prototypical experience of alienation. The idea of object becomes a substitute for the object itself such that the culmination of development is "when a child can 'do' everything in his head, that is, when he can divorce theory from practice" (Buck-Morss, 1975). Piaget's educational philosophy has as its principal goal, education that creates people capable of doing new things; minds which can be critical, which verify, and do not accept everything they are offered. Buck-Morss finds Piaget's developmental theory at odds with this philosophy for "innovation has to do with social as well as logical possibility; and if contradictions exist in reality, it is not enough to eliminate them in thought" (Buck-Morss, 1975).

Buck-Morss refers to recent studies which have shown that non-western children excel in Piaget's tests when they are related to the particular practical activities of their parents. Western children can perform on all of the tests not because they are any more intelligent, but because abstraction structures their world. As an example, the work of Maccoby and Modiano in Mexico found that "equivalence reasoning characterizes the children of industrial workers and not peasant children, although both live within the same national culture" (Maccoby and Modiano, 1969, p. 23). It is possible that similar differences exist between children of different North American socio-economic groups but unfortunately very little work is carried out by psychologists relating cognitive development to a child's experience outside of the laboratory or interview situation. If there were such a literature we might find that the children of manually working parents have a different knowledge of the environment than say the children of middle-class parents who participate more in abstract levels of society. Their's might be a knowledge more related to their use of the environment and its resources with less knowledge of its abstract qualities such as overall spatial organization. Such research seriously needs to be carried out. Not until some empirically based alternative theories are developed will criticisms, such as those of Buck-Morss be taken seriously. In the meantime, persons carrying out research in environmental cognition must come to recognize that cognition cannot be studied separately from people's interests and intentions.

In an effort to make some "tentative assessment" of the effects of informal learning on "science learning" and the ability to abstract, Dart and Proshan (1967, p. 652) asked Nepalese and American children to draw free-hand maps showing how to get "from your house to the school." The Nepalese children made maps which showed the house and school as pictures and "the process of going from one to the other, not the spatial relationship of one to the other" (p. 653). In contrast, American children represented their homes and school with abstract symbols and "there is a clear effort to show spatial relationships and to provide needed spatial clues." The authors note that the Nepalese adults also make such sequential or route maps. The suggestion is made that they are inferior as maps but, unfortunately, the question of whether or not the Nepalese navigate quite adequately within their environment and culture is not raised. Again the mistake of not thinking of cognition in relation to human purposes has been made.

Sex-Related Differences in Topographic Representations

The tendency of cognitive developmental theorists to think in terms of universals of development and to underemphasize the important modifying effects of environmental experience probably serves to explain why most of the studies reported in Hart and Moore (1971, 1973) failed to report any comparison between the ability of girls and of boys to represent the large-scale environment. Two studies carried out on children's cognition of and orientation in, large-scale environments since that time, Moore's study of teenagers and Acredolos' study of infants and children, did analyse sex as a variable but failed to find any differences. This is a little surprising given the large literature demonstrating the greater superiority of boys' performances over those of girls' in a number of various standardized tests of spatial ability (Maccoby and Jacklin, 1974; Saegert and Hart, 1976). This is especially so when one considers that Moore (1973a) and Bycroft (1974) found a relationship between scores on the standardized tests and the level of spatial representation ability. Explanation to this confusion no doubt lies in the fact that these various tests involved different skills. An answer must wait until someone carefully partials out what the different qualities of the tests are and how they may, or may not, relate to the problem of representing large-scale environments. In the meantime, interesting suggestion comes from studies of spatial ability in two African tribes (Nerlove, Monroe and Monroe, 1971; Monroe and Monroe, 1971). In these studies it was found that males ranged further away from home in their daily activities (as described in Appendix A-1), and performed better on several tests of spatial ability. Further, it was found through correlation analysis that those girls and boys who travelled the furthest each day also performed better on the spatial tests. The suggestion is made that the greater restriction of girls reflects a reduced amount of environmental experience which is related to their lower spatial ability. Only through some kind of pre/post test interventional study, whereby spatially restricted girls are liberated, could this hypothesis be properly answered. Nevertheless, the speculation is most stimulating: if boys are more free to explore and to make decisions of a spatial nature as they navigate through environments, it is quite possible that this would influence the development of some spatial skills. Saegert and I argue that this is just one area where girls are taught to think of themselves as environmentally incompetent (Saegert and Hart, 1976). It may well be that not only the different experiences themselves, but also the resultant lack of confidence, may combine to diminish girls' spatial abilities.

Bycroft (1974) found implicit support for the inferiority of girls in cognitive mapping skills already in the literature. His interpretation is different from what Saegert and I have suggested (Saegert and Hart, 1976). He suggests the inferiority of women on cognitive mapping tasks is related to their tendency to pay more attention to the accurate aggregation of detail than to the retention of a total configuration - an analytic as opposed to a synthetic strategy. He refers for support to the finding of Lord (1941) that boys are better at location and direction finding but that "when accuracy of response was compared, there was no significant difference" (Lord, 1941, p. 492), and to three British urban imagery studies which suggest that women draw "more detail" (Bishop and Foulsham, 1973), draw "a slightly weaker image" (Eyles, 1968), and draw "the most constricted maps" with a tendency "to add roads and landmarks one after another on an incremental basis" (Goodchild, 1974). Unfortunately,

Bycroft, in his study of the relationship between performances on spatial ability tests and on a cognitive mapping task, chose to limit his sample to boys only in order to simplify the experiment.

The question area remains open for some careful experimental work relating children's test performances to their everyday environmental experiences. It is an important area of research, particularly for those persons concerned with equality of educational opportunity. Spatial ability testing is the area where the greatest sex differences have been demonstrated and these tests are claimed to reflect general intelligence. If as Saegert and I suggest, these scores do reflect a lower level of environmental opportunity for girls, something would need to be done to redress the balance.

Beyond the Experienced Horizon

Research on children's cognition of the landscape has focussed in the main upon representations of the environment as reflected in their ability to externally represent, through language or graphic means, the spatial relations of features in the landscape. This review recognizes representation as just one aspect of a child's place knowledge. Place recognition must also be considered. Previous research in developing techniques for eliciting children's topographical representations with Stea and Blaut (1973), and with Mark (1972), had led me to believe there was a much larger landscape which existed for children than that which they could map for us. It is highly likely that children will externally represent for us only those features which have been incorporated into their developing schemas. They will fail to show us a considerably larger landscape, a "landscape of familiarity" which consists of features with which a child is sufficiently familiar to be able to recognize but not able to represent, either internally or to others. The very act of mapping in some way (i.e. placing in a context of other things) is probably essential to mentally fixing an object, to being able to represent it as distinct from just "recognizing" it. Research on place knowledge needs to recognize this distinction.

Peter Gould (1973) attempted to measure what information Swedish children have of distant places and what preferences they have for places to live in Sweden. He found that the youngest children in the sample, aged seven and a half years old, were unable to give their preferences because they were unfamiliar with maps (which were used in the method) and had little spatial information to guide them in their choices. But by nine and a half years of age he found some collective image of places had formed, these sharper even further for 11 and a half year old children. In a more direct measure of place information, Gould asked the children to simply write down, in exactly five minutes, all the names of villages, towns, and cities in Sweden they could think of. When mapped, the seven and a half year old children's maps showed a very low information surface, with the highest point directly over the local area and descending quickly away from there, and rising slightly around the three major cities of the nation. The only other vague pattern Gould could find was the effect of what he describes as "grandmother noise" caused by the knowledge of principal cities as the homes of relatives. By nine and a half years of age much more information is acquired by children. Knowledge is clearly shown of vacation places, and places prominent in the news. Unfortunately, this was a

quick data collection study and Gould did not independently inquire about the children's environmental experiences. He does offer some explanations for the patterns however. A primary one comes from the gravity type model so familiar to geographers. He found that much of the pattern of information could be explained as a function of the size of a population of a place, and its distance away from the children's home town. This model offered a high degree of predictability, with the seven and a half year old's information surface only a little bit less predictable than that of the older children. But this is not too surprising. We now need to go beyond this gross naming of places to research on what the children themselves are wanting to learn about places, what place information they are trying to gather, for what purposes, how they are learning informally, and how this can be facilitated by education.

APPENDIX A-3

REVIEW OF THEORY AND RESEARCH ON CHILDREN'S PLACE FEELINGS (1)

The Development of Object Relations in Infancy

Parallel to Piaget's work on the development of the object concept connected with the development of intelligence (reviewed in Appendix A-2) Freud and many of his followers in psychoanalysis investigated what they call the development of object relations connected with the development of affect. The development of object relations is the process whereby an infant gradually comes to experience itself as differentiated from other human beings, in particular, from the mother. Searles believes there is a dimension to this process that psychoanalysts have sorely ignored: "it involves an infant's becoming aware of itself as differentiated not only from its human environment, but also from the non-human environment which falls within its ken" (Searles, 1959, p. 30). The development of object relations is completed within the first two years of a child's life, but it is given central consideration in this discussion because whatever one's theoretical predilection, a child's earliest explorations with self-environment awareness must have important consequences for any developmental conceptualization of children's place experience.

Piaget had himself attempted to examine the relationship between affectivity and intelligence from a genetic viewpoint in The Construction of Reality in the Child (1954). He noted in this work that "a certain type of cognitive structure must correspond to each new level of emotional behavior" (Piaget, 1954, p. 10) but this research was not rigorous. His population was small (his own three children) and the stages of emotional development he used were borrowed in part from psychoanalytic theory; they were neither experimentally verified nor the product of systematic observation. But perhaps the greatest weakness of this research was the correlation between two series of phenomena, intelligence and affectivity: chronological age was used to compare a given stage of intellectual development with a level of emotional development. There was no basis for age statements. Even psychoanalysts are wary of specifying ages for the levels they have determined (Decarie, 1965, p. 6). Fortunately, in a very thorough experimental investigation, the French-Canadian psychologist, Therese Guoin Decarie, attempted to determine the connection between these two concepts (Decarie, 1965). Decarie's research was based upon experiments with 90 children and Piaget compliments her for the task of verification she achieved. However, before describing her research, the term object relations must be further defined and distinguished from the term object concept already described above in the review of place knowledge.

1 A condensed summary of the development of children's affective relationship to places may be found at the end of this Appendix A-4.

The development of the object concept occurs when things are "conceived as permanent, substantial, external to the self, and firm in existence . . . and maintain their own identity whatever the changes of position" (Piaget, 1954, pp. 5 and 7). Object relations is defined by Decarie from her review of contemporary psychoanalytic theory as "the affective tie which a subject establishes with an object" (Decarie, 1965, p. 69). She defines it more precisely for her own theory as "The libidinous tie which the subject establishes with any object" (p. 69). It is of particular interest to note here "with any object." By this she means everything which is not the self, including inanimate as well as animate objects. The "libidinal object" may be broadly interpreted here as the object which is positively cathected (felt), even before the infant is capable of experiencing a positive emotion. She warns that care must be taken not to identify the libidinal object only with people as psychologists commonly do.

As we saw above, Piaget assumes that the initial universe of the child is chaotic, moving, without independent objects, but that by two years of age a child finds himself or herself as one element within a world consisting of objects which are substantial, permanent, independent of the subject's activity, and which retain their identity. Psychoanalytic theories similarly describe some kind of object development extending over the first 18 months, beginning with practically nothing and ending with a universe of extremely diversified objects:

The psychoanalyst conceives of a primitive universe in which the subject has no self-awareness or awareness of the external world. In this universe only states of tension and discomfort are felt. Attachment to someone or something remains impossible. This loveless objectless universe over a period of 12-15 months passes through a certain number of phases and becomes transformed into a world within which the subject clearly distinguishes himself from the environment and a person object in the environment. (Decarie, 1965, p. 72).

Object as defined by psychoanalysts in "object relations" is different from that of Piaget and "objective development" does not proceed in as clearly defined steps as the "object concept" in Piaget's scheme of development. However, by noting the points of agreement in psychoanalytic writings, Decarie extracted three general periods of development: a narcissistic period, a pre-objectal intermediary period, and a true objectal period.

The Narcissistic Period

In the period following birth, a child lives in an undifferentiated world with no distinction made between one object and another or between the self and objects (the environment). There are different opinions as to how long this period lasts. A child lives in "a peculiarly fluid, unbounded, twilight sort of world" so that "the awareness of an outer world in which things happen, can rise and submerge" (Escalona, 1953, p.12). Consequently it is difficult to say precisely how long the period lasts. Spitz however,

one of the central scholars in the field of object relations research, claims to have demonstrated that it lasts until a child's first smile, indicating recognition of a human partner, usually the mother, around the second or third month (Spitz, 1965). The following account of what we may imagine to be the infant's experience in this period when compared to our own highly objectified and differentiated awareness of the landscape most poignantly reveals the degree of development the child must later pass through:

At first the world is a succession of different sensations and feeling states. What varies is the quality and distribution and intensity of sensations. Except for the difference in the nature of the sensations involved, hunger which we say originates from within, and a sharp sound or cold breeze, which we cannot imagine except as something that reaches us from the outside, are indistinguishable. There is no awareness of such things as approach, withdrawal, or direction of any sort. Even if the baby turns his head toward the nipple and grasps it, his sensation is that the nipple comes or is; no other state with which to contrast this exists. Light and darkness; harshness and softness; cold and warmth; sleep and waking; the contours of mother's face as seen from below, vis-a-vis, or even from above; being grasped and released; being moved and moving. The sight of moving people, curtains, blankets, toys; all these recede and approach and comprise the totality of experience in whatever constellation they occur at each split second in time. With recurrence, they develop islands of consistency. (Escalona, 1953, p. 25).

The Intermediate Period

This second phase of objectal development is essentially transitional. It still contains some elements of the narcissistic period while it anticipates some of the characteristics of the final period. Ego formation begins somewhere between the third and sixth month. Clues as to the precise onset of this period are the subject of considerable controversy, but there is general agreement that the first differentiation between self and external reality is the index. The smiling response of the individual and the ability to postpone gratification are believed to be the indicators by a number of scholars. The following description of the transition in terms of space and time, the two complementary aspects of the ability to wait, by Escalona seems particularly expressive:

. . . when we speak of a separation between the self and the non-self, it is equivalent to saying that some experience of distance emerges; separation implies distance. It seems more than chance, therefore, that early forms of reality oriented behavior and intentional action become observable at that time in development when distant receptors (vision and sound) have reached functional maturity. (Escalona, 1953, p. 23)

It must be noted that the earliest discriminations relate to the human partner, usually the mother: pleasure when beholding him or her, and displeasure when deprived of the same. This occurs in the third month but there is no such discrimination with toys or with food (Spitz, 1965, p. 2). The infant's smile is still only a response to a signal, for a smiling mask will produce the same response, but this signal is derived from the mother's face, which commonly occurs simultaneously with food, protection, and sense of security. This restricted response of the child, Spitz calls a pre-object relation and the signal, part of the human face, is but a precursor of the object.

The True Objectal Period

This period, which extends from between six to about 12 or 15 months, has a terminal character; at the end of the objectal period is a permanent object. Important in this development is the concomitant development of perception, motor activity, and memory. Through perception, the "love object" (the mother) is now visually distinguished from all other objects; motor activity is now sufficiently under ego control to make intentional activity towards specific goals possible; and the infant's memory traces have stabilized to the point where he or she can judge whether a face is the same as a previously perceived face. Furthermore, with the onset of this period, a child will react with displeasure to the loss not only of a person, but of a toy. From this first negative affect, a child is believed to develop a wide range of emotion in the second half year of life to the point where he or she shows not only enjoyment of toys, but "a positive sense of property toward some special object" (Spitz, 1965, p. 70).

Decarie points to a further development of importance in this period according to the Freudian theorists: the development of the reality principle. The pleasure principle, the tendency to seek satisfaction independent of other considerations which has dominated life now begins to give way to the reality principle. The fear of loss of the love object is now less than the fear of losing the love of the object. The Freudian theorists believe that only this desire to retain or to gain the love of the parents along with the desire to come to terms with reality, causes the infant to gradually and reluctantly relinquish the pleasure principle, the desire to return to a state without stimulation, excitation, tension, and striving, perhaps to the womb. Schactel claims that Freud failed to observe that "from birth on, the infant and the child show an eagerness to turn toward an increasing variety of things in the environing reality and that the sensory contact with them is enjoyed rather than experienced as a disturbing excitation (Schactel, 1959). In this criticism of Freud, Schactel does not deny the tremendous significance of the change from intrauterine to extrauterine life. He believes drives and affects arise with the separation of the individual from complete "embeddedness" within the womb which both shelters and supplies energy. The function of these drives and affects is to bring the individual in this new level of existence into contact with new sources of energy supply and to maintain contact with a favourable environment and avoid an unfavourable one. Such notions may seem a long way from the interest of this research in a child's relation to the macro-environments, but this is not so if we consider the possible enduring significance of this

separation. Space and time, in their biological meaning, begin with this separation. All affects arise from spatial and/or temporal gaps which develop between us and our aims in the world after we have left the embeddedness of intrauterine life where space and time do not exist for the individual. This is the very foundation of our personal geography.

This rather lengthy discussion of the development of object relations tells us that not only is the physical environment gradually constructed by a child (as reviewed under place knowledge, Appendix A-2), but that this world of objects carries from the beginning of place experience, in the newborn, an important affective component which lasts through life.

Children's Attachments to Special Objects

The most famous "special object" is Christopher Robin's teddy bear, Winnie the Pooh (Milne, 1975), but it is well known by parents in general that a few months after birth infants may be expected to become very attached to some "special object." This is commonly a particular blanket or furry toy, etc., which is valued for its textural qualities. This phenomena is in fact so taken for granted that mothers commonly encourage the attachment. Stevenson, who made a study of these special objects wrote that "Mothers seemed everywhere to recognize that these adored objects could not be lightly dismissed and must be respected by the adult" (Stevenson, 1954, p. 203). The Newsons in their sociological study of four year olds found that 31 per cent of the children of this age still had an attachment to one particular bedtime object (Newson and Newson, 1968). Winnicott, a psychoanalytic theorist, has incorporated this phenomena into a general account of children's coming to understand themselves in relation to the environment (Winnicott, 1971). He calls these special objects "transitional objects." He suggests that they are for a child, the first unchallenged area of experience which is neither him or herself nor his or her mother. They probably help form a bridge between extreme egocentricity and the recognition of an external world and of adults with independent actions. In a preface to an empirical study of these objects by Stevenson (1954) entitled The First Treasured Possession, Winnicott tries to explain this difficult to understand transitional area of existence between inner reality and external reality:

The transitional object is not the same as the next soft toy. It can be said that the next one must be acknowledged as coming from the world. The infant is expected to say "ta" [English word for "thank you"] and in this way to make an acknowledgement, as we know, but it is essential to understand that from the infants point of view it was created by the infant (p. 200).

The transitional object is not a symbol for the mother for this would mean that the child had clearly distinguished between fantasy and fact. It is extremely valuable in reducing anxiety; an anxiety which psychoanalysts relate to the infant's separation from the mother. Some of the fundamental qualities of a special object, according to Winnicott, are that: it must never change unless changed by the infant; it must seem to the infant to give

warmth, or to move, or to have texture, or to do something that appears to show it has vitality or reality of its own; it must survive loving, hating and even "pure aggression." Finally, Winnicott explains, the object is "decathected" (i.e. its great emotional importance erodes). It is not forgotten or repressed but relegated to limbo:

It loses meaning, and this is because the transitional phenomena have become diffused, have become spread out over the whole intermediate territory between "inner psychic reality" and "the external world as perceived by two persons in common" (Winnicott, 1971, p. 5).

There is no clearly demarcatable age at which the special object is no longer important. Some children described by Stevenson still felt the need to carry a piece of blanket or a soft toy to school at seven years of age, for others at this age it is more common for them to want the object to hold or cuddle when they go to sleep.

Although a child may no longer need the special object at all times, this does not mean that he or she no longer occupies the intermediate space between inner reality and external or objective reality. Winnicott goes on to argue in his book that we occupy this space whenever we play: as children in play and as adults at times of artistic creativity, dreaming, or religious experience etc. Play initially occurs then in an intermediate space which Winnicott calls the "potential space." This space lies between an infant and its mother-figure. Trust is required. Great preoccupation characterizes the play of a young child; the potential space cannot be easily left by a child nor can it easily admit intrusion (Winnicott, 1971, p. 51). In this play, a child manipulates external phenomena in the service of a dream and invests certain physical things with dream meaning and feeling. Play according to Winnicott is exciting and precarious because it belongs to the interplay in a child's mind of that which is subjective (near-hallucination) and that which is objectively perceived (actual, or shared reality). It is a most important space for the healthy development of all children for we must all come to some reconciliation between reality and fantasy. This theme is continued below in a discussion of play by another psychoanalytic theorist, Erik Erikson.

Environmental competence may be defined as a feeling that one has the knowledge, skill and confidence to use the environment to carry out one's goals and to enrich one's experience. There are many theories of play and none of them alone are adequate to explain the diversity of this phenomena but much of play does seem to be motivated by a desire to be competent in the world. (See White, 1959 for a general discussion of competence as a motivational variable.)

Erik Erikson, psychoanalyst and developmental theorist, has stressed the great importance of play to a child's development (Erikson, 1963, p. 209-241). Like Freud, he sees play as "the royal road to the understanding of the infantile ego's efforts at synthesis" (Erikson, 1963, p. 209). He describes a child's development along this "road" in a manner of great interest to this consideration of children's experience of the physical environment.

He theorizes that a child's play is the infantile form of the human ability to deal with experience by creating model situations and mastering reality through experiment and planning. Three scales of play environment are identified: the autosphere, microsphere and macrosphere -- which develop in this order for a child.

The Autosphere: Erikson describes children's first play as auto-cosmic play, play which begins with, and centers on, his or her own body. Such play is the simple exploration by repetition of sensual perceptions, of kinesthetic sensations, of localizations, etc. The play which follows, Erikson describes as an individual's "first geography" (Erikson, 1963, p. 220). A child now plays with available things and persons; he or she may, for example, "playfully cry to see what wave length would serve best to make the mother reappear ... or he or she may indulge in experimental excursions on her body and on the protrusions and orifices of her face" (p. 220). He suggests that "the basic maps acquired in such interplay with the mother no doubt remain guides for the ego's first orientation in the "world", and witnesses the writing of Santayana (1936):

Far, far in a dim past, as if it had been in another world or in a pre-natal condition, Oliver remembered the long-denied privilege of sitting in his mother's lap. It had been such a refuge of safety, of softness, of vantage: You were carried and you were enveloped in an amplitude of sure protection, like a king on his throne, with his faithful bodyguard many ranks deep about him; and the landscape beyond, with its messengers and its motley episodes, became the most entertaining of escapades, where everything was unexpected and exciting, yet where nothing could go wrong; as if your mother herself had been telling you a story, and these pictures were only the illustrations to it which painted themselves in your listening mind.
(Santayana, 1936, p. 220-21)

The Microsphere: is the small world of manageable toys. Erikson sees this as a "harbor" established by children as a base to return to when s/he needs to overhaul his or her ego. The objects of this microsphere have their own laws--they may break or resist reconstruction or they may be removed by someone else, or they may lead a child into a free expression of "dangerous" themes and attitudes which lead to anxiety. A child's performance in this small "thing-world" has a direct effect on his or her further development. If frightened or disappointed the child may regress into the autosphere, but if successful, and guided properly, the pleasure of mastering toy things becomes associated with mastering the traumata projected onto them.

The Macrosphere: is the world shared with others (Erikson, p. 221). It begins at nursery school where at first the others are "treated as things, are inspected, run into, or forced to be horse" (p. 221). As with the prior two spheres of play, the child has to learn what potential play content can be carried out within it. Each sphere in this way becomes endowed with its own sense of reality and mastery.

In summary, Erikson's theory further supports the importance stressed

by Bowlby upon questions of a child's spatial relationship to the mother and the outside world. It also suggests that an infant's opportunities to modify the environment and otherwise demonstrate competence through engagements with it, are extremely important for their development.

I am familiar with no empirical literature on the further development of environmental competence of childhood. White however has put forth the convincing argument that a general sense of competence is something important to all children and that it is in fact a basic motivational variable. An intrinsic urge to learn how to deal with the environment is in accord with Piaget's theory. As Carr and Lynch describe it: "to act experimentally and to see the results of that action are the most effective ways to learn (Carr and Lynch, 1968, p. 1282). When this is added to Searle's notion that it is easier for a child to effect the physical environment than the social environment the importance of environmental competence becomes clear. How opportunities for exercising environmental competence vary from one environment to another has not been the subject of any empirical study but this seems to be at the base of the belief by Carr and Lynch that the intractable environment of suburbs can be every bit as "growth denying" as a slum (Carr and Lynch, 1968, p. 1278).

A Child's Continued Differentiation of Self from the Environment

Little specific mention is made of the physical environment as an important factor in a child's developing concept of self by the orthodox psychoanalytic theorists reviewed above. Fortunately, it has been discussed by authors outside of the profession. The philosopher Susan Langer, in a discussion of the development of symbolism, remarks on the role of the physical environment in the development of the concept of self:

One of my earliest recollections is that chairs and tables always kept the same look, in a way that people did not and that I was awed by the sameness of that appearance. They symbolized such-and-such a mood . . . To project feelings into outer objects is the first way of symbolizing, and thus of conceiving those feelings. This activity belongs to about the earliest period of childhood that memory can recover. The conception of "self," which is usually thought to mark the beginnings of actual memory, may possibly depend on this process of symbolically epitomizing our feelings. (Langer, 1953, p.100).

Susanne Langer claims these feelings for objects are among the earliest recollections. But to what age does our memory reach back? According to psychoanalytic theory, it is the fifth or sixth year; this is when "childhood amnesia" is believed to come to a close (Schactel, 1959, 279-322). This is much later than the occurrence of the true objectal period as discussed above.

Many persons would argue with this, claiming recall back into their third year of life and proving it to themselves through the use of externally verified temporal "benchmarks." But there may be a futility to such attempts because it is impossible to know how one's memories have been infused with a

rich history of hearsay of your past times from other friends and family, from dreams and from the imagination (Bachelard, 1962). Furthermore, much of memory is atemporal; it does not seem to proceed in a linear, sequential, reverse chronological order. Perhaps Susan Langer's memory extends back further than many others would claim. She is not alone in her ideas. Searles believes a child's awareness of feelings and of "self" is facilitated in the period prior to the achievement of true object relations through finding the non-human environment to be:

. . . relatively simple and relatively stable, rather than overwhelmingly complex and ever shifting; and to be generally available to him rather than walled off from him by too many parental injunctions against his relating to it, and parental distortions, conveyed to him by the parents concerning the nature of this environment. (Searles, 1959, p. 82)

The subjective oneness with the environment (human and non-human) experienced by the infant during the pre-objectal period, Searles believes has repercussions throughout the development of the personality. This is the main theme of his book:

. . . the human being is engaged, throughout his life span, in an increasing struggle to differentiate himself increasingly fully, not only from his human, but also from his non-human environment while developing, in proportion as he succeeds in these differentiations, an increasingly meaningful relatedness with the latter environment as well as with his fellow human beings. (Searles, 1959, p. 30)

He reports the work of Piaget and his co-researchers but he extends the notion of three levels of normal maturation at which non-differentiation occurs: the sensorimotor, the representational, and the level of formal thought (see Appendix A-2). Searles suggests a fourth: an unconscious level of concept formation wherein a subjective oneness with the non-human environment may remain long after differentiation on a perceptual and conscious level has been achieved (p. 37). As proof of this, he notes that if the psychotherapist of a schizophrenic patient were irrevocably differentiated from the non-human environment, he would be unable to sense the anxiety which greatly differentiated patients experience. Searles believes that during this period of an "unmasterable environment which is totally, or at least predominantly, comprised of non-human elements," great anxiety may be experienced. He believes that one of the reasons there has been little realization of the importance of the non-human environment is that any determined effort in this direction brings up in psychoanalysts the kind of anxiety which he suspects he and they knew in their own childhood, "when the world around us seemed often times comprised largely, or even wholly, of chaotically uncontrollable non-human elements" (p. 39). Furthermore, he believes we (adults) have unconscious memory traces of our loss of non-human environments which in childhood had been sensed as a harmonious extension of our world-embracing self:

Thus the exploration of this whole subject, no matter upon how scientific a plane we attempt to pursue it, impinges upon a

deeply rooted anxiety of a double-edged sort: the anxiety of subjective oneness with a chaotic world, and the anxiety over the loss of a cherished omnipotent world-self (Searles, 1959, p. 39).

This phase of oneness with the environment in infancy is relatively well documented, but Searles' extension of his hypothesis to a claim that the development of a child's ego recapitulates the development of the human race, is more suspicious.

For Searles, the richest source of evidence for the undifferentiated phase has been his own long-range psychotherapy with schizophrenic patients. He feels their regression parallels in reverse the development of object relations in children. For the most seriously ill of these patients, he has found an inability to distinguish clear boundaries between the self and the non-human environment. At the time of writing, he felt he could reconstruct from psychotherapeutic work with schizophrenics, two stages which probably precede the infant's recognition of his own aliveness: an early phase of oneness with the total environment and a subsequent phase--the animistic period in which all objects are personified.

Our earliest notions of self and environment are undoubtedly important but clearly our awareness is not fixed for life by these early developments. Unfortunately, there is much less discussion of these later years in the literature. For this reason, Schactel's Metamorphosis is a valuable book (Schactel, 1959). It reveals more clearly than other accounts that motoric, cognitive, social and emotional development are not separate for the child. Because he is concerned with experience, Schactel deals with each of these realms of behavior concomitantly. The most distinctive characteristic of his ideas on human development, and one which greets my own predilection and the foundation of this research, is his view of children as desiring to turn toward the world, enjoying active discovery and exploration. This compares markedly with Freudian theory which holds that the "pleasure principle," the desire to achieve a state without excitement and stimulation, is the most basic desire of a child and only the desire to gain the parents' love and to come to terms with reality cause a child to turn toward the environment. Schactel's book does not attempt a comprehensive account of human development, but identifies some crucial factors in affect, perception, attention and memory. Of particular relevance to this research is his discussion of the affective aspects of our perception of the environment.

Following from the notion of original "embeddedness", Schactel (1959) sees people as having two fundamental ways of behaving: we can develop and expand our relation to the world on the level of a relatively independent and autonomous existence (emergence), or we can consciously or unconsciously, refuse to accept this challenge and desire some substitute to the haven of the prenatal state (embeddedness). According to this theory, people lie throughout their waking life somewhere between embeddedness and emergence from embeddedness. Closely linked with this scheme, is Schactel's notion of the development of human perception. He recognizes two basic modes of perceptual relatedness, the autocentric or subject-centered, and the allocentric or object-centered. In the autocentric mode, the emphasis is on how and what the person feels. The is a fusion between sensory quality and associated pleasure or displeasure, and

the perceiver reacts primarily to something impinging on him. In the allocentric mode there is an emphasis on what an object is like, on what Schactel terms objectification, and the perceiver usually actively turns to or approaches the object and in so doing opens himself toward it receptively or tries to "grasp" it either figuratively or literally. Developmentally, autocentric perception predominates almost exclusively at the beginning of the infant's life and gradually gives way through infancy and childhood to the increasing importance of allocentric perception. The distinction between these two basic perceptual modes, popularly called "lower" and "higher" senses, respectively, is not an absolute distinction. The "higher" senses (seeing, hearing, and the active sense of touch) usually function in the allocentric mode and are the only ones capable of full-fledged allocentric functioning, while the "lower" senses (taste, smell, proprioception, thermal, and pain) always function predominantly in the autocentric mode and are not capable of real allocentric perception. Schactel describes two ways in which the predominance of the perceptual mode may vary: the ontogenetic shift to the increasing importance of the allocentric mode, and the variation of perceptual mode with the general attitude of the person. I shall concentrate here upon the former because of its particular relevance to the development of children's place experience.

It has been discussed above how objectification of the environment develops only gradually through infancy and childhood. Through "intersensory perception" (combination of the senses), the landscape is given to us as a configuration of independently existing objects. The independent experiences of the more highly developed senses, especially sight, offer a similarly structured landscape of elements related to each other and to the observer, but Schactel argues that the lower senses offer something akin to the objectless, primitive sensory organization of an infant which carries qualities of well-being or ill-being. The predominant function of sight (recognition of, and orientation in a visible environment) reveals, according to Schactel, not only the quality of objectification but also, for most people most of the time, an absence of pleasure-displeasure-boundness. Its high degree of objectification is the product of a number of qualities. Because through sight, features can be perceived simultaneously, more features can be perceived, and these through more dimensions, than through any other sense. In contrast, autocentric senses, and even touch in its active allocentric mode, brings the object to the perceiver successively. The superiority of sight is further emphasized as the size of objects or features increases, for now many objects which are open to vision are not accessible to touch, or even if they are accessible, do not reveal their structure and shape if they exceed a certain size. Schactel therefore believes that a tree, a house, a mountain or a landscape could not be grasped as a unified whole without vision. In the developing geography of a child, sight provides a far more comprehensive perception of distance and spatial relations than is provided by touch. Sight can however also function in an autocentric manner. This, as discussed above, is particularly so in the infant, but to a lesser degree it alternates with allocentric functioning in children and adults. The experience of form and structure tend to be more allocentric compared to the experiences of seeing light and color and of what Schactel calls "the total insistence of the visual field." In allocentric sight the perceiver turns towards the object actively and selectively and in this way, out of the total visual field grasps its form and structure. In autocentric sight, color and light impinge upon the eye, which reacts to them, rather than actively and selectively seeking them out. And so it is, that in recognizing and orienting in a landscape

we usually perceive form and structure in an emotionally neutral way, whereas the "pleasure and charm or the dissonance and gaudiness of color pervade everything man sees" (p. 110). He recognizes that the grasp of form and structure in the environment can provide a deep feeling of joyful satisfaction, but claims this is a qualitatively different feeling from that of color perception which always stimulates, excites, calms, or soothes. Nevertheless, most of the time seeing has the neutral quality of everyday recognition and orientation and, according to Schactel, many people lose their capacity to enjoy seeing after childhood. The important principle to note for this study is that children do extract from the unity of sight, just as the impressionist painters for example, saw primarily color in the landscape.

The passive experience of visual impingement may occur with the "total visual field":

The total visual field impresses itself on the eye; it seems to come toward one and to lose the qualities of distance and spatial structure if one gazes at it without trying to see any particular object. At the same time, light and color and indistinct multitude become the outstanding qualities seen. The passive eye, especially on a bright day or even more, on a day with the intense diffuse light from a slightly overcast sky or from a not too heavy fog, feels assailed as it were by this impinging field. But as soon as one focuses on an object, the rest of the visual field, which just before seemed to come towards the eye, now recedes into the background and periphery; the impinging field is changed into a structured one. (Schactel, 1959, p. 113)

Schactel believes that something similar to this impingement of the total visual field may be an important part of the visual experience of earliest infancy. How the experience of environmental perception develops in children from there on and how it might vary as a function of culture-specific training or even different environmental experiences, remain matters for speculation, but Schactel has given us some useful concepts to manipulate and explore.

The Role of Place in Supporting Emotional Development

Many writers from diverse disciplines stress the important role of the physical environment in supporting a child's emotional well-being and developing sense of identity, but there is remarkably little supporting evidence. The most valuable writings are by those who have attempted to report either their own experiences or those of others. Under this category are a small group of psychoanalysts (Bettelheim, 1960; Schactel, 1959; Searles, 1959) and social scientists writing specifically for the urban design profession (Mead, 1966; Jacobs, 1961; Jephcott, 1971).

The most direct attempt to address the question of place in the psychoanalytic profession is that of Searles (1959). In a book entitled The Contribution of the Non-human Environment to Normal Development and Schizophrenia, he writes that the non-human environment:

. . . apparently provides, in the life of the normal infant and child, a significant contribution to his emotional security, his sense of stability and continuity of experience, and his developing sense of personal identity (p. 78).

Searles writes that a child's relatedness to animal pets, to plants and to inanimate objects provides a context which facilitates his or her becoming aware of feeling capacities and personality traits. One role of the landscape in normal ego development, which he discovered from his work with schizophrenic patients, is as a kind of "shock absorber" upon which a child can project various parts of him or herself until his or her ego is sufficiently strong to integrate them into a developing sense of self. This concept of displaced affect has been well recognized in the psychoanalytic literature. Searles does not give it special emphasis. His book is designed to demonstrate that the non-human environment has more importance beyond that of a collection of objects for this function.

A number of writers have pointed to the stability or continuity of the physical environment as opposed to that of the human environment as an important fact to be considered in the emotional development of a child and his or her need for security. Searles writes of his work with schizophrenic patients:

. . . the considerable percentage of these persons who as children have had the experience of numerous changes in residence, have been deprived thereby of what is, in normal living, an important source of security for the child--the security of dwelling, year after year, in familiar surroundings. I have repeatedly seen these patients struggling to remember where they lived, at what age, struggling in a way which indicated that it was very important for their own sense of personal identity, of personal integration, to be able to establish such a continuity of experience in their memory. (Searles, pp. 82-83, 1959).

Such evidence strongly suggests to Searles that a young child's relationship with, for example, "his toys, his clothing, the furniture of the home, the house itself, and so on", (presumably to the neighborhood and school) has much greater importance for development in adult life than is presently recognized in psychoanalytic theory. Bruno Bettelheim came to a similar conclusion in his study of kibbutz child-rearing where family life as we know it has been replaced by communal child-rearing (Bettelheim, 1969). Bettelheim believes that the example of the kibbutz reveals that our view of what ingredients go into love and care of infants may be parochial and not universal. A child needs love and tender care because it creates in him or her a sense of trust. Bettelheim believes that the inner experience of the infant which leads to trust is that of security. The two components of this security are physical security and companionship, but this companionship need not be that of the sameness and continuity of the outer provider (usually the mother) as in our society; it may be built up of other ingredients (pp. 81-83). In the kibbutz, a child's visits to

the parents' room are limited to two hours after each work day. Bettelheim believes that a place that offers a haven of closeness for a few discreet hours a day is not much of a physical or emotional haven and hence cannot offer much security. Furthermore, in most kibbutzim the infant is confined to the nursery under the care of the metapelet (nurse maid). The result of this is that the infant's house becomes his or her true home. In this way, says Bettelheim, a child develops a stronger attachment to peers than to parents or adults in general, and more directly to the concern of this review:

. . . the children become attached to their infant's and children's houses because these do not rebuff their emotional attachment, do not disappoint them. These at least, stay put, and were at one time truly "theirs". (Bettelheim, 1969, p. 285)

Bettelheim goes on to stress even further the importance of the physical environment. He writes of the kibbutz-born:

They seem not to expect to be intimate with others; only with nature can they commune in the deepest sense. (Those who feel otherwise will form part of the group who will leave.)

Theirs is not a farmer's love for his land; it is a true love relation with nature. Since nature does not disappoint them in relation to it they can let themselves feel deeply. (Bettelheim, 1969, p. 287)

This attachment is, not surprisingly, to a particular tract of land:

Usually it was not nature in general a Kibbutznik would speak of, but a particular feature of his kibbutz that he alone had embraced or so he thought: a place by the lake; the view from (or at) a hill; a glen or some other small place which, by loving, he had made his own. (Bettelheim, 1969, p. 286)

Bettelheim found this deep attachment to the "Mother Earth" in both sexes, but it seemed to him much more marked in the males. Because several women expressed a desire to leave the kibbutz in order to have their children with them (a move prevented by their husband's love of nature), Bettelheim surmised that women look to their children instead of to nature to satisfy their longing for intimacy.

Although most suggestive, Bettelheim himself recognizes these ideas must be tempered by the nature of his sample. Firstly, he spent sufficient time at only one kibbutz to gain some "fuller understanding of how the children are raised; at the remainder of the kibbutzim he visited, he could only grasp these matters "in part". Secondly, he points out that the kibbutz and its educational methods and even the place of the kibbutz in Israeli society are still very much in flux.

In a paper prepared for the environmental design profession on the planning and design of neighborhoods, the anthropologist Margaret Mead, identified continuity in human relationships as one of the few really basic human needs (Mead, 1966). Like Bettelheim, she recognizes that this need does not necessarily have to be provided by its biological mother or even a single person. A child reared from birth to be accustomed to eight different persons can be given a sense of continuity by any one of them. The physical environment can be a support in this:

And where the immediate environment--the shape of its bed and the smell of its room--is part of what is continuous, the child can stand a greater variety of persons close to it. (Mead, 1966, p. 247)

Mead claims "there is considerable evidence that failure to take this 'basic need' for continuity into account may lead to severe conflict in young children." She does not say what her evidence is but her statements sound self-supporting:

A familiar and trustworthy environment is necessary for the child to learn that things will be here tomorrow that are here today and that its hand, reaching out, will find out what it is seeking for. (Mead, 1966, p. 247)

Mead notes that in recognizing this need there are still many possibilities open to us in the planning of future neighborhoods. The family car can become a house so that in moving to a strange place the car still will be a familiar home, or children can be brought up in the same place every summer but in a different place each winter. Mead believes that we must not carry the need for continuity to an extreme; familiarity with the strange is also important. If children are to live in a changing world, they must become acquainted with strangeness "almost from the time of their birth" (Mead, 1966, p. 248). This has implications for the size of the "basic neighborhood". There are those planners she notes who would like to keep everything within a safe, closed environment with no cars or strangers, thereby creating a grass plot neighborhood where all the children can run. While Mead agrees that there must be places where children can walk and run and where they can be safe, she believes that we also need places which enable them to live dangerously part of the time. If a family moves into an area where there are no play spaces and front yards, parents may be so frightened that children who have had no preparation for dealing with traffic will run under vehicles, that they give the children no freedom of movement at all. As a parallel she notes that one tribe she knows of (she does not say in what culture) experienced a great environmental change in the form of a large river which changed its course, passing close to the village. The children fell in, for they and their parents did not know how to deal with the situation. She contrasted this with another tribe that had lived on the same river for a long time. In this village, the parents knew how to teach their children to deal with the danger and the children were safe (Mead, 1966). These ideas are paralleled in another book for the planning profession, this time by the sociologist, Jane Jacobs (Jacobs, 1961). In a chapter entitled "The Uses of Sidewalks: Assimilating Children," she notes that children "need a variety of places to play and learn" and they "need an unspecialized home base from which to play, to hang around in, and help form their notions

of the world" (p. 80). She recommends the sidewalks. On sidewalks, children can learn the fundamentals of successful city life. She believes that when this home-based play is transferred to playgrounds and parks it becomes not only expensive and unsafe but less rich for a child's social development:

Play on lively diversified sidewalks differs from virtually all other daily incidental play offered American children today: it is play not conducted in a matriarchy (Jacobs, 1961, p. 83).

Jane Jacobs writes insightfully from her own observations. An observational study by a psychiatrist interested in children's play in the city of Baltimore seems to support her ideas (Cohen, 1973). Cohen describes convincingly the understanding which develops between children and local adults as to the dual function of the street for play and for cars and some of the social learning that occurs in this situation.

The Importance of Nature to Children

In a remarkable article entitled The Ecology of Imagination in Childhood, Edith Cobb (1959) argues that a major clue to mental health lies in the spontaneously creative imagination of childhood (1). She argues that the ultimate satisfaction of perceptual expectancy and perceptual exploration is the organization of the perceptual world into "good gestalt", into forms which are rich in meaning: "the need to make a world is intricately related to the sense of identity" (Cobb, 1959, p. 542). Using various forms of projective methods and play techniques, particularly the Lowenfeld World-Play Technique and the Thematic Appreciation Test, she had concluded that "what a child wanted to do most of all was to make a world in which to find a place to discover a self" (p. 539). She focusses in her writing upon childhood from five or six to 11 or 12 years of age.

There is a special period, the little understood, pre-pubertal, halycon, middle age of childhood, approximately from five or six to 11 or 12, between the stirrings of animal infancy and the storms of adolescence when the natural world is experienced in some highly evocative way, producing in the child a sense of some profound continuity with natural processes and presenting overt evidence of a biological basis of intuition. (Cobb, 1959, p. 538)

She arrived at this conclusion after reviewing some 300 volumes of autobiographical recollections of the childhood of creative thinkers and discovering that it is largely to this middle period of childhood that the writers return to in memory in order to renew their creative impulse at its source. This source she argues, from their accounts, is their early experience of emerging,

1 An extended version of this paper is to be published as a book with the same title by Columbia University Press (New York) in 1977.

with consciousness, into "a living sense of a dynamic relationship with the outer world." She seems to argue that experience with the natural world is important in the development of a "biological basis of intuition" because it permits a child to see and think in terms of process. No doubt almost all of the autobiographies in Edith Cobb's collection are written by members of intellectual classes who did experience nature in childhood for there are very few recognized geniuses who grew up solely in inner city areas devoid of perceptual access to nature's processes. This makes her arguments less powerful and calls for someone to attempt to pull together a similar analysis of city childhood memories. The idea of nature's importance as a wellspring for creativity is not new of course; Wordsworth's poetry of childhood is perhaps the best example. But Edith Cobb manages to transcend the criticisms of naive romanticism through the breadth of her thinking and by drawing from psychological and ecological theory. She is certainly touching upon something which very many adults recognize when she writes:

It is significant that adult memories of childhood, even when nostalgic and romantic, seldom suggest the need to be a child but refer to a deep desire to renew the ability to perceive as a child and to participate with the whole bodily self in the forms, colors, and motions, the sights and sounds of the external world of nature and artifact.
(Cobb, 1959, p. 546)

Perhaps it is this which explains the great willingness adults have to talk to investigators about their early childhood environments (e.g. Lukashok and Lynch, 1956, discussed below).

Land-Use Preferences

Remarkably few attempts have been made to ask children directly or to ask adults to remember what qualities of the childhood physical environment are important to them (studies of children's evaluations of playground equipment and toys are considered too narrowly focussed for consideration in this review). However, one modest and relatively informal piece of research carried out twenty years ago by two planners on adults' memories of their childhoods offers some valuable insights (Lukashok and Lynch, 1956). The authors quite rightly preface their findings with the warning that memory is likely to be inaccurate and colored (see Bachelard, 1962, for a discussion of childhood memory). The authors conclude that while their summary lists may not be complete or totally representative nevertheless it is highly likely that those places which were recalled, and with such vivid detail, were significant in childhood because of their frequency of use, strong emotional ties, or their relation to the child's needs.

Forty persons, half students and the other half drawn from a wide range of occupations, responded to a battery of open questions on their childhood neighborhood, their city as a whole and on traffic, etc. The taped responses were analyzed by breaking them down into arbitrary topics and ranked according to their frequency of mention. The summary of findings was expressed succinctly;

The feelings and key elements that run through all the interviews on childhood memories have strong similarities. The remembered children were sharply aware of lawns and floor surfaces; they delighted in foliage, woods, and green. There is a strong and pleasant memory for hills and for water in the landscape. A somewhat ambiguous fascination with the big transportation vehicles is equally clear. There was conscious alertness to spatial qualities, a definite preference for openness and spaciousness, and distaste for crowdedness. Even in childhood, perception is strongly colored by associations of social status: by "niceness," by cleanliness, by upkeep, and by money . . . The child wants variety with a chance for some adventure; he has a strong need to act upon the physical environment, to be stimulated by it, and to realize his imaginative fantasies through it. (Lukashok and Lynch, 1956, p. 52)

The value of these findings only becomes clear when one contrasts them with the reports of observational studies of children's land-use. These purely 'distant' surveys offer objective comparative data but fail to capture places or even what particular qualities of places are being attended to by the children under observation. By contrast Lukashok and Lynch received vivid records of the values of particular places, especially places free from adult authority, not specially planned for children, and suitable for modification both physically and imaginatively:

We would rather play in the foliage. I think it represented a certain amount of mystery and imagination. You could invent things.

Our idea when I was nine or 10 years old was not to play on the playground but to find some place where there were rocks and broken bottles . . . a lot of trees and holes to fall into.

I really liked to play most of all in the back alleys. I'd feel like an adventurer . . . it was a wonderful place to hide, you see, because of all kinds of doors and passageways.

These examples carry the powerful message that freedom to make one's own play environment is important to children, a concept brought together most effectively in a later article entitled The Theory of Loose Parts by Simon Nicholson (1971).

Also under-recognized in most accounts of children's play environments was the great emphasis placed upon the surfaces of the landscape, not in terms of their aesthetic merits but in terms of their suitability for playing: grass

was first, followed by dirt that can be dug or molded, and any smooth surface suitable for roller skating and cycling was ranked third in frequency of mention.

The childhood memories described by Lukashok and Lynch gave considerable emphasis upon social status as expressed through the landscape. The relative density of population living on a street was one of the first things mentioned. Closely related to this were comments concerning cleanliness, order and maintenance. A particularly revealing indicator of status to these city children was the presence, and quality of upkeep, of the lawns. It is no doubt partly from the landscape clues that children learn to discriminate one neighborhood from another and, in some cases, thereby mentally create hard boundaries around areas which they will not cross (see for e.g. Ladd, 1970).

Interviews with adults about their childhood, particularly in combination with interviews of their children, remain an untapped, potentially valuable, source of information on children's place values and feelings and how they change.

Place Fears

No studies have been carried out specifically on children's fears of places. However, all of the general studies of children's fear to date have found distinct patterns of fear to particular kinds and qualities of place. Those discovered by Gesell in his normative developmental studies are summarized as part of Figure A-1 (Gesell, 1940; Gesell, Ilg, and Ames, 1946). The largest and most comprehensive studies on children's fears were carried out by Jersild beginning 40 years ago (Jersild et al., 1933; Jersild, 1943). Most of the more recent works have included fear as just one part of larger longitudinal studies and have failed to focus in on the situations that arouse fear. (See review by Bowlby, 1975). They have also relied entirely upon information from mothers: a source which is too unreliable to be adequate by itself (1). Jersild used a variety of methods: detailed daily records by parents, simple experiments, interviews with children about current fears, and completion of questionnaires by adults about their fears as children. More studies have been carried out which deal with infants (during the first two years of life). Some of the findings are described here for their value in illuminating what appears to be a genetically given tendency to respond to certain fears.

1 According to Bowlby: "Mothers are not expert observers, nor are they disinterested" (Bowlby, 1975, p. 124). Furthermore, a mother is often ignorant of what her child's fears are. In an interview by Lapouse and Monk (1959) with a sample of 193 children aged between eight and 12 years and their mothers, disagreement between the two parties varied between just seven per cent in regard to some fear inducing situations to 59 per cent in regard to others. Most frequently the reason was that a child described situations which the mother said did not produce fears.

The Fears of Infants

From about four months onwards an infant begins to distinguish the strange from the familiar and will occasionally respond to a stranger with a whimper, a cry, or a frown (Bronson, 1972, reviewed by Bowlby, 1975). By nine or ten months the sight of a stranger results in a clear fear response. A child of about the same age is also likely to be afraid at the sight of strange objects or new situations as in the jack-in-the-box experiment of Meili (1959, reviewed in Bowlby, 1975). Other situations which regularly bring fear to infants in their first year of life are perceptions similar to those which "in the wild" would bode danger to a human: the fear of falling (Gibson, 1969) and the fear of a rapidly approaching object (Bower et al, 1970). Bowlby argues that all of these situations to which infants show fear in the first year of life are "natural clues" to potential danger which an infant inherits genetically in order to increase the chances of survival (Bowlby, 1975).

The Fears of Children Over Two Years of Age

During the second and third years further fears are revealed, particularly fear of the presence of animals and the fear of the dark, both of which Bowlby argues are rational derivatives of the natural clues described above. Some children develop a fear of animals because of bad experiences with them but Bowlby believes that the reason for its extremely high occurrence in children (e.g. 27% of five and six year olds in one of Jersild's studies) is that animals exhibit at least three of the natural cues that arouse fear simultaneously: rapid approach, sudden movement, and sudden noise. Perhaps it is the unpredictability of the movement which makes snakes the most fearsome of animals to them. Of equal fear in children of all ages (and in adults) is the fear of the dark. Again there is a combination of natural clues: strangeness and being alone. Commonly, familiar forms in the environment become ambiguous and open to wide interpretation at night, such as car headlights on a bedroom wall, trees in the wind, and the dark interiors of sheds or cellars.

From their second year on children are much influenced by observing the behavior of adults and by imitating them, learning to fear certain situations. These new situations are termed "cultural clues" to distinguish them from the inherited "natural clues." Only gradually do children learn to distinguish these natural and cultural clues from what Bowlby a little misleadingly calls "real danger", and to learn how to calculate risk themselves (1). But it is wrong to conclude that fear behavior based on natural clues or cultural clues of observation only are "childish" and "irrational" and that only fear based on truly learnt clues are mature or rational. Children's fears of the natural clues --strangeness, sudden change of stimulation (especially noise), rapid approach, height, and being alone--have commonly been wrongly interpreted as irrational by

1 Elsewhere Bowlby makes it clear that what he means is culturally defined danger not "real" danger" "It is indeed easy to forget that what is held to be permanently real is never more than some schematic representation of the world that happens to be favoured by a particular social group at a particular time in history" (Bowlby, 1975, p. 186).

clinicians and theorists in the past. According to Bowlby (1975), these persons failed to recognize that each of these clues is simply a genetically given signal of potential danger. A genetic bias to respond to these with withdrawal have, through evolution, become characteristic of human behavior because of their survival value (Bowlby, 1975). While more apparent in childhood, these biases remain with us throughout adult life. The result is that in modern Western environments, fear can be aroused about situations which are not at all dangerous. We must understand that it is not rash or irrational of children (or adults) to rely on a system of clues to danger and safety that have been effective to human survival for millions of years.

The focus of Bowlby's interest is children's fear of being alone, a basic natural clue to increased risk of danger. Statistically, being alone is less safe than being with a companion. It is this, together with the rational clue of strangeness, which Bowlby argues leads to a marked tendency throughout life for us to be drawn towards familiar people and places and to be repelled by places and situations which exhibit one or more of the natural clues. In children, attachment, to a parent figure (usually the mother) is the first result of this tendency to be drawn toward the familiar (c.f. Appendix A-1 on "attachment behavior"). For children we may reasonably anticipate that there would be a series of physical objects and places which most embody the natural clues of safety perhaps beginning with a child's special object (blanket or toy) and expanding outward through their cot and bedroom, until the home becomes the best physical expression of a safe, secure base.

The Misattribution of Fears

A common approach adopted by psychoanalysts for explaining children's fears has been to claim that they are really afraid of other things than those which the children say are frightening them. Part of this theoretical tradition has been to claim that children project their fears on to otherwise non-frightening objects and places. Bowlby has an alternative explanation. Because in Western culture we are expected to be afraid of only real dangers, he argues there is a strong bias both in a frightened child, and in an observer, to attribute the fear to something other than the natural clue. A child's fear of monsters in the dark for example may be no more than a rationalization of a fear of the dark (Mark, 1970, in Bowlby, 1975). The Newsoms (1968) found in their study in Nottingham, England, what we have all observed and experienced, that such rationalizations are commonly encouraged by other children and even by adults, through teasing about what a child might meet in the dark when alone. Bowlby believes there is an even more common cause of mistaken or biased attribution of fear. When a number of fear inducing clues occur together such as when a person alone in the dark hears strange noises, the tendency is for a child to focus all fear upon only one component of the situation such as the noises in this example. It is only a small step from this for the child to claim that it is ghosts or witches which were frightening.

The Learning of Fears

In addition to fear related to natural clues, children develop particular fears as a result of specific direct experiences, stories heard, and threats

made by others. In Newson's study of four year olds for example they found a child avoided going near water because she had once fallen into a river (Newson and Newson, 1968). Mention has already been made of the cultural clues of danger learnt by children's observation of others. In addition, children learn fears from the stories of others. Perhaps it is a combination of both observation and listening to a mother's tales which explains why a number of studies have found significant correlations between the fears of children and their mothers (reviewed in Bowlby, 1975, pp. 192-197).

Some fears may be related to the recurrent themes of children's story-books because young children have difficulty distinguishing fact from fiction. It is no doubt through ancient stories and myths, and more recently books and films, that attics, caves, and abandoned buildings have become the archetypal places to fear even though darkness may be the more important underlying cause for fear of these places. In this regard, there is no need to be limited to the more obvious examples of medieval Germanic fairy tales and the tales of Grimm. Even such solidly American authors as Mark Twain recognized these archetypal place fears in his descriptions of childhood. Finally, one cultural cause of fear which is particularly difficult to identify are threats made by adults and by other children. To a young child it is difficult to discern that threats made at the height of anger may be unreal. In closely studying the adults responses to the questionnaire on childhood fears, Jersild and Holmes (1933) concluded that very often the threats were exploitations of children's tendencies to fear one of the noticed clues like darkness or being alone, such as locking children in a dark room for punishment.

In summary, the wide range of evidence pulled together by Bowlby from multiple sources suggest that a child's fears are the result of experience and learning in combination with certain understandable genetically given "natural" fears. This is a most convincing alternative to the great emphasis which has been placed in the past on "internal" explanations by clinical psychologists. As a result of the combination of these forces a child gradually learns, during the first two years of life, to fear darkness, strangeness, animals and separation. From five years of age a child steadily learns to become more discriminating in what is feared but is never entirely free from the "natural clues" to danger which we have all been handed as a basic tool of human survival.

The Fear of Being Lost

Beginning with the pioneering book on mental representation of the geographic-scale environment, The Image of the City, by Kevin Lynch, there has been a largely implicit belief that a major reason for studying environmental imaging, or "cognitive mapping" is that we all have a fundamental fear of being lost (see Lynch, 1960, particularly the Appendix). The only study known to me which deals explicitly with this fear in children is by Kaplan (1976). From past work with children and teenagers experiencing natural areas for the first time, in summer camps or nature trips, she had learnt that urban children in particular had a profound fear of being lost in the woods. As a result she designed a series of mapping methods and games to train children and teenagers about orientation in the topography of natural areas before these children explored a large arboretum. It was found that children were more confident, comfortable and adventuresome after these orientation experiences but the study

did not clearly demonstrate that it was the fear of being lost which so troubles urban children about the woods. It could equally well be fear of animals or a more general fear of the unknown. It may not of course be possible to separate a general fear of the unknown from the more specific fear of being lost. If this is true the authors should not claim that being lost or way finding was the crucial variable. Nevertheless it is encouraging that someone has dared to take the rarified field of "cognitive mapping" into the more complex realms of research dealing with the inter-relationship of place knowledge, feelings and action through an interventional research design.

Gesell's Narrative Accounts of Children's Development

Gesell's accounts of social and emotional development deal in part with some of the aspects of child development reviewed separately above. They are discussed here under a separate heading because the author used chronological age as a category for describing behavior traits, and no attempt was made to relate these observations to theories of child development. Gesell has not constructed a theory of child development and the limitations of using age as a category for drawing generalizations has been discussed in the introduction to this chapter. Nevertheless, Gesell's records of the longitudinal observational studies of children at the Yale Clinic of Child Development remain valuable as an account of observed sequences of "personal-social behavior" (Gesell, 1940; Gesell et al., 1946). The following summary is recorded in abbreviated form in Table A-1. Again, it should be noted that Gesell used the pronoun "he" in a generic sense for boys and girls.

In accord with the above review of the development of object relations and the object concept, Gesell writes that the one year old child has a "fragmentary sense of personal identity and almost no sense of personal possession" and is usually content with independent self-absorbed and spontaneous play (Gesell, 1940, p. 32).

By two years of age, a child shows an "unmistakable proprietary interest in things and persons" and begins to use the word "mine" (Gesell, 1940, p. 38). Social contacts remain few and brief and play is solitary or parallel (i.e. together with, but not cooperative with that of another child).

At three years of age, the child knows clearly that he or she is a person with a separate identity from others. Play with others begins but solitary and parallel play for cooperative play takes time to learn. Gesell sees this third year as a kind of adolescence, a coming of age. Through language the child is graduating into broader social life but:

. . . he does not always find it easy to cut from his moorings. He returns gladly to the comfort of parental protection after brief adventures in self-dependence. The outer world is full of wonders and strangeness. (Gesell, 1940, p. 46).

The four year old is described as combining independence and sociability. The child seems self-reliant, assertive, and even "bossy", but s/he prefers associative group play over parallel play. At this age, s/he is

"constantly going out to meet the environment, making his thrusts in an almost harum-scarum manner" (p. 63).

The five year old is said to be so relatively independent and self-sufficient that "one can easily imagine a self-operating Lilliputian village of five year olds, which would require only a moderate degree of external control" (p. 56). Even more than at four years of age, associative play is preferred over solitary and parallel types of play. Companions are desired and groups of four or five children enjoy "group projects, requiring construction of houses, garages, switch yards, and city planning" (Gesell, 1940, p. 57). Unlike the erratic behavior of the four year old, "he takes time to consolidate his gains before he makes deeper intrusions into the unknown" (Gesell et al, 1946, p. 63). His world is described as a "here and now world" and "if his universe has a center it is his mother" (Gesell et al, 1946, p. 63). He remains physically close to the home.

Just now, he is not in a pioneering phase of development. He has a healthy intolerance for too much magic and too much fairy tale. He has just barely discovered his actual world, and this has enough novelty and reality on its own merits. He is even something of a homebody. This is not because of abnormal dependence, but because the home is a complex institution which invites and rewards his consideration. He is happy to play house. . . He must make the familiar more familiar to himself; the familiar world is still new (Gesell et al, 1946, p. 64).

The greatest fear identified for this age is that a child will be deprived of his or her mother. Gesell notes that this may be difficult for the mother for it confines her to the home even when her child is asleep.

Six was described as a pioneering age in the section on motor development. This is also true of other aspects of development, for the six year old described in Gesell's now dated test is the "school beginner" and massive changes are introduced into his or her social and emotional life in making the transition. Children derive confidence in this strange world beyond the home from the teacher "and from the protectiveness of a partially standardized environment" (Gesell et al, 1946, p. 95). The school becomes a most important part of a child's environment:

Perhaps because he is constantly making new discoveries he craves a few fixed points in his mental universe . . . His emotional anchorage remains in the home, but he has to acquire a modified set of emotional moorings in the school. The two orientations are not interchangeable and not mixable (Gesell et al, 1946, p. 95).

The fears described for this age group are explicitly related to the development of a child's relationship to the landscape:

With the undoubted reorientation that the five and a half and six year old child is experiencing in space, he becomes more aware of upper and nether regions. Boys particularly, are frequently afraid of the cellar and occasionally of the attic. Dark is to be feared because it moves in space and destroys all spatial relationships (Gesell et al., p. 95).

Seven is described as an "assimilative age," a quieting down from the impulsive activity of the six year old. A child goes into lengthening periods of calm self-and-absorption. S/he is not, however, an isolationist, and he achieves a measure of detachment from his or her mother by developing attachments to other persons. Group play is not highly cooperative but rather loosely organized and individual ends are still prominent. Children at this age have an immature sense of property for though they can conceptualize mine and not mine, this distinction can be lost in their absorption with the idea of owning it himself. Again Gesell discusses the landscape under the category "Fears": "He may fear high places and unfamiliar visual impressions. Cellars become inhabited by strange creatures and attics by ghosts (Gesell et al, 1946, p. 146)."

At eight years of age, a child again becomes expansive but unlike the impulsive six year old, s/he has "a positive outgoing contact with his environment, including his elders (Gesell et al, 1946, p. 160)." For the first time Gesell finds it necessary to distinguish between the sexes. He writes of "spontaneous segregation" in the playground and though the children share many interests, they are becoming "vividly aware of distinctions which separate them (Gesell et al, 1946, p. 164)." In summary he writes of eight year olds:

His universe became less disconnected. He himself was less submerged by the widening world. He began to make fundamental distinctions between persons and things, between the impersonal forces of nature and the psychological forces of children and man. Above all, he began to see himself as a person among persons, acting, participating, and enjoying (Gesell et al, 1946, p. 168).

The chief distinguishing characteristic observed in nine years olds was self-motivation: "He has a growing capacity to put his mind to things, on his own initiative or on only slight cues from the environment (Gesell et al, 1946, p. 188)." The spontaneous groupings in school are nearly always unilateral: the girls with their clubs "in which some time is devoted to giggling and whispering," the boys in "rough-housing and wrestling" (p. 193). There is reciprocal disdain between the two sexes.

The distinctive characteristics of ten year olds according to Gesell are very similar to those of nine year olds. They are less urgent in their activities, however, and seem able to budget their use of time and energy. There is still little contact between the sexes though they enjoy group games of one sex against the other. The behavioral characteristics of this age are not described in The Child From Five to Ten. Gesell's accounts of their morphology, like this book, closes with the complex changes that occur with the onset of adolescence.

APPENDIX A-4

REVIEW OF RESEARCH ON CHILDREN'S PLACE-USE

There are countless numbers of environmental design and planning project descriptions which claim to have taken children into account in housing developments. One might expect then that children's use of the environment would have been the subject of carefully designed comparative investigation. As in the case of access to the environment described above (Appendix A-1), this is unfortunately not so. Most of the research has been poorly designed and is piecemeal. It is extremely difficult to extract generalities with sufficient confidence to allow for any comparisons across different studies. First, the authors themselves seem to have made a concerted effort to avoid replicating any other investigators methods or categories of observation and analysis (for an exception see Cooper, 1974 who attempted to make comparisons with the British studies). This review will not therefore, attempt to summarize the specific findings on children's use of the environment but will focus upon the methodological problems involved and upon some of the more important generalizations which were identifiable (1). An abbreviated summary of the development of children's play activities according to normative studies is included in Table A-1.

The methodological problems associated with the observational studies by the British Department of the Environment and by other similar studies have already been described under Children's Spatial Activity (Appendix A-1, above). Probably the most useful finding of these studies is that even very well equipped playgrounds attract children for only a small part of their time outdoors (e.g. Morville, 1969; Department of the Environment, 1973). It seems that the primary function of these playgrounds is a meeting place, a kind of social center for children (2). Much of children's choices for play places

1 Attempts have been made recently by members of the planning and design profession to summarize and generalize the findings on children's place-use in order to develop useful design and planning guidelines (Cooper, 1974 and Pollowy, 1973). Unfortunately, such reviews fail to include any systematic critique of the reliability or validity of findings from the different studies.

2 This is a general statement concerning the utility of fixed playgrounds in residential areas which inevitably become boring to the child residents. It is not meant as a total condemnation of such playgrounds which clearly serve a function for children, especially those under eight, for certain kinds of motoric activity--swinging, climbing and riding, etc. Neither is it meant to deny the obvious advantages of highly manipulable and changeable playgrounds especially in areas where such opportunities are otherwise limited. The qualities of these playgrounds have been the subject of some excellent documentation and description (see Moore, 1974a and 1974b; Rothenberg et al, 1974).

in urban areas are on streets, sidewalks, or access areas, irrespective of the degree of traffic (e.g. Morville, 1969). Another popular play location for children in housing developments are the "small landscaped areas outside dwellings" (c.f. Martensson, 1973). This information reveals that if planners and designers wish to improve the quality of children's outdoor experiences they must begin to pay attention to much more than the location and design of playgrounds (for an excellent insightful plea on this case see Jane Jacobs, 1961). They need to consider a child's total engagement with the physical environment and they need to carry out holistic research investigations. The best example known to me of such research is that conducted by Brower and Williamson for the Planning Department of the City of Baltimore (Brower and Williamson, 1971-1974, and 1974).

The work of Brower and Williamson is particularly commendable because of the attempt made to use a variety of methods which supplement, cross-validate and enrich each other. In three contiguous urban renewal projects, two of low income and one of middle income population, five methods were used: a driving census, a walking census, playground observations, resident diaries and interviews, and time-lapse photography. The research was conducted between May and September and its conclusions should be considered in the light of this seasonal limitation.

In the driving census, a route was followed which passed by "most of" the neighborhood parks and playgrounds. The purpose was to make comparisons between recreational uses within playgrounds with uses outside of playgrounds, but unfortunately the criteria for determining the route was not explained. Sex and age were recorded as accurately as the observers were able and their activity was recorded as one of eight activity categories. This method undoubtedly holds promise for planning departments with limited time and financing but two aspects of it could be improved. First, and by their own admission, it was difficult to record age accurately; in my estimation, the danger of making false statements would be lessened by recording broad age-categories rather than trying to record specific ages. Secondly, the activity categories were no doubt designed to speed the process of recording but the derivation of this set of eight categories is not explained at all; a most frequent practice in such research. It is difficult to know in such cases what the importance of the categories are to the children. Thirty-eight driving censuses were made in all, balanced between mornings, afternoons and evenings, weekdays and weekends. Five sites were selected for more detailed observation by walking, each included a park or playground. The rationale for selecting these areas rather than others was, like the driving route, not explained. This weakens any generalizations that might be made about children's environmental behavior in urban areas for it is not clear, at least to the reader, how the investigator effected the study by making such arbitrary selections of routes and areas. The same age, sex, and activity categories were used as with the driving census and they are subject to the same limitations stated above. Walking censuses were made for two months at each site between May and September for four times per day, three days per week including weekdays and weekends.

Other research, very similar to that of the Department of Environmental studies, has been carried out, but most of it is of such relatively poor quality, usually because of an inadequate sample size (e.g. Coates and

Sanoff, 1973; Sanoff and Dickerson, 1971; Damer, 1970; Cozzens, 1971) that their findings are not revealed here. One interesting aspect of the observational sampling technique of Coates and Sanoff (1973) and Sanoff and Dickerson (1971) is that they made their observations from a car, "except when visual access was inadequate" (Sanoff and Dickerson, 1971, p. 99). The reason given was "to preserve the desired unobtrusiveness." Two explanations of this desire seem plausible. The first is that they were frightened of attacks from the community (in which case they could not have previously acquired the support or informed the residents of their research activities) which makes the research ethically questionable. An alternative explanation is that the investigators wished to avoid effecting the children's play behavior: this would demonstrate a limited understanding of children's play for personal experience I have learnt that children will soon lose interest in any acting out for investigators; this concept is, I believe, a conceit which child researchers have used as an excuse for avoiding close contact with children.

Four brief papers on the geography of children in Detroit illustrate the insights into children's environmental behavior that can be achieved by interviewing as well as observing children (Colvard, 1971). But these papers present little more than anecdotal information. The research is not presented at all clearly. If research is to be anything more than newspaper style reporting, it needs to state fully the details of the population involved, the methods used and the data before it is graphically reduced and presented. Part of the interest of the present research is to discover how children's use of the landscape varies with place, age, sex and the seasons. To this end, the land-use observational sampling procedures used above, best exemplified by the English studies, provide a suitable model. But this approach is not alone sufficient to suit the needs of this research. None of the studies recorded in their observations the individual identity of the child, only the sex, approximate age, location, and type of activity. This meant that the studies could only provide aggregate data on the use of the environment. It would be impossible using this methodology, to describe either children's ranges from their home, or the use of different places by the same child. Furthermore, by not working with individual children, observational data cannot be compared with interview data in the direct manner required in order to see the relationships between spatial activity, place experience and place-use.

There has been one in-depth study carried out closely with individual children in the field; an unpublished dissertation produced in the Department of City Planning of the Massachusetts Institute of Technology (Southworth, 1970). This study is limited to boys aged ten to 12 years in Cambridgeport, a physically, socially and culturally diverse inner city neighborhood of Cambridge, Massachusetts. This study was based on the recognition that learning is most likely to happen in places that attract children. It attempted to identify the types of places that were known and valued by children and how they were used. This was done in order to better conceptualise a new kind of "urban service for children" which would facilitate their learning from the city, in the manner described by Carr and Lynch (1968). The methods used in this study were diverse and in some cases original. Of particular value to this discussion of place is the use of "city diaries" in which the children kept a log of their activities. This served as a check upon place values

discovered through interviews, maps, and photo surveys made by the children. From other different sources Southworth was able to discover the importance to children not only of such well known qualities as the love of motion, but also of food, climbing, water use, bike-riding places and games and automated devices which provided opportunities for manipulation. The study remains the only comprehensive field account of children in the most important immediate pre-teen age group in the United States. The recently completed, but also unpublished study, coordinated for UNESCO by Kevin Lynch offers similar information for urban children of Poland, Australia, Argentina and Mexico (UNESCO, 1975).

A common weakness of the observational studies of children's use of housing areas is that they have been conducted in the warmer months only, thereby providing a most slanted view of children's place-use in the northern hemisphere. One exception to this is a Swedish study which studied the relationship between use of the out-of-doors in direct relationship to the weather (reported in Morville, 1969). Children's outdoor play was found to be dependent on the wind and the temperature especially in the high blocks where wind is most hampering. A graphical representation of children's outdoor activities in the course of the day shows almost the same course as a combined graphical representation of wind and temperature during the same period. According to the Swedish study the number of children playing out of doors is lowest in January and February, reaches a maximum in May and subsequently decreases during the months of the summer holidays. Outdoor activities are said to reach a maximum again during September-October and diminish from there on.

There is a growing literature on the influence of toys in socializing children, particularly in the different sex-role development of girls and boys (see review in Saegert and Hart, 1978). Unfortunately, because of the tendency in child-studies, already described, to rely upon observations of children in institutional settings such as day-care centers, or upon simple questions, very little has been written on the subject of parental influence on children's use of the environment. One extremely valuable exception to this rule is the most thorough study on child-rearing with four year olds in Nottingham, England by Newson and Newson (1968). This research illustrates the important role toys play, through the intermediation of parents as "tools" of socialization, as for example in the development of generosity through the encouragement of giving toys away. Through a series of questions on cleanliness and tidiness it was learnt that there is a significantly different pattern of restriction amongst the professional and managerial classes as opposed to the poorer social classes: the former class has fewer mothers who are highly restrictive. The relative liberality of the kind described by one mother undoubtedly has an effect on the development of children's sense of self and environment:

"She can paint and splash and make pastry to her heart's content in the kitchen and the bathroom; the bunks were bought because we thought they'd be nice for climbing and jumping on, and the kitchen table is very solid because I liked to sit on the kitchen table when I was young . . ."

(Newson and Newson, 1968, p. 155)

Newson and Newson explain this difference in terms of differences in educational background (the idea that messy play is natural and valuable) and differences in economic and material circumstance. But this rule is not hard and fast as revealed by a window-cleaner's wife who accepts the ravages of children because they need to enjoy themselves:

"Dianne, the one at school, says, "I'm going to make a den (a "house")," and she takes me clothes-horse up and coats up, pillows, and ooh, they don't half make a mess! Everything's upside-down. They're den-mad. Aren't you Tina?" (Newson and Newson, 1968, p. 158)

Newson and Newson did not focus in their study upon differences in equipment and toy use and restrictions of boys and girls but they did note a greater willingness by the mothers to accept boys being dirty:

"I think lads look rather attractive with a bit of dirt on them."

and:

"If he kept clean I should think there was something wrong with him." (Newson and Newson, 1968, p. 162)

In summary, Newson and Newson have made a good start in demonstrating that parents carry, either explicitly or implicitly, a philosophy of child-rearing which has a demonstrable effect upon children's development. Parents attitudes must clearly be recognized as an important element in any future studies of children's environmental behavior.

TABLE A-1
SUMMARY OF THE LITERATURE ON CHILDREN'S EXPERIENCE OF PLACE

THE FIRST YEAR OF LIFE		
Physical Growth, Play and Spatial Activity	Place Perception and Knowledge	Social and Emotional Development
<p>When awake and comfortable, babies spend their time looking and listening--"hungry for stimuli" even within the first two weeks. Touching and handling of objects cannot occur until the coordination of hand and eye in the third to fourth months (Piaget, Millar).</p> <p>The movements leading to sitting, standing, and crawling become the objects of games. As soon as crawling begins, will crawl most of the time; the same with walking (Millar).</p> <p>By 7 months, the child is a sitter; so well adjusted in growth and posture that it can spend much time in active manipulation, and exploration of the physical world (Gesell). Clearly recognizable play now begins--"the pleasure of being a cause" as in knocking toys against the cot to make a noise, and the "pleasure of function" when it involves the baby's own body, as in repeating a sound it has just learnt to make. Doing something repeatedly when the skill is already within the child's capacity and serves no purpose is play according to Piaget (Piaget).</p> <p>At 10 months, creeps on hands and knees (Gesell).</p>	<p>First exploration of world is visual (Fantz). Newborn baby can see and discriminate patterns as the basis for form perception. Can also focus on a moving object within the line of vision (Kidd and Rivoire, and Bower).</p> <p>Can visually follow an object by 16 weeks (Gesell); rapid development of perceptual discrimination, e.g. by 6 months shows fear at a visual cliff (i.e. a drop-off in front of a child) (Gibson).</p> <p>After 7-8 months--distinguishes mother's face from others and cries in presence of stranger (Bowlby).</p> <p>By end of first year, evidence of many of the perceptual constancies (constancy--the tendency to see things as we know them to be rather than as they may be presented to our senses) (Wermer & Elkind).</p> <p>The auditory mechanism is well developed at birth. Children respond to auditory stimuli after the first few days of life. Localization of sound direction usually established during the second half of the first year. Some localization of the distance away of the sound source occurs within the first year.</p>	<p>Gradual development of awareness of self and an object world separate from self throughout this first year. To sense toys or parts of crib as relatively constant parts of environment in 2nd or 3rd month is a pleasurable event (Decarie, Escalona, and Schactel (1960)).</p> <p>Seemingly, not influenced by other children (Cratty).</p> <p>Attachment to adults at first unselective (smiles at most adults). About 6-7 months special attachment to mother becomes noticeable. Proximity--maintaining behavior (crying or following when mother leaves room) begins at this time. Crawling begins at about 10 months in USA; infant makes excursions away from mother and if allowed may even go out of her sight, but he/she returns from time to time. Will explore more readily if mother is there--this difference especially marked with strange persons or in strange place. By end of first year, expresses positive attitude only toward adults who have been familiar figures; to others the child often exhibits fear and withdrawal (Bowlby).</p> <p>Symbolic language begins, but individual words for entire phrases.</p>

<p>At one year, stands momentarily alone; walks with one hand held (Gesell).</p>	<p>Unable to abstract the essential qualities which characterize the identity of objects and to classify those which are similar but not identical within the first year (Vernon).</p> <p>Infant acts in a series of separate spaces based on different personal needs and body parts, e.g. postural space, auditory space, mouth-related space and visual perceptual space (Piaget).</p> <p>In the first months the child does not differentiate self from the environment. In the third to seventh months there is considerable development in differentiating self from the environment: recognition that objects have permanence develops gradually. During eighth to tenth month, "object permanence" is further developed; begins to search for objects that have been hidden from view but still thinks of them as having only a single position (Piaget and Decarie).</p>	
<p>THE SECOND YEAR OF LIFE</p> <p>Enjoys gross motor activity. By 1½ years: walks and seldom falls; runs stiffly; likes moving large toys, explores house. By 2 years of age, runs without falling. Squats in play (Gesell).</p> <p>Any game which makes use of recently acquired skills, or involves changes of touch, sound and sight, will amuse once the baby can move around, e.g., the contents of drawers, shelves, etc., will amuse for relatively long periods of time. Much play is imitative at this time (Willard).</p>	<p>Capable of matching colors and forms. By age two, has a large passive vocabulary--can differentiate and identify a wide range of sounds e.g. father's car, family pet. Displays perceptual preferences--tastes, colors and sounds (Weiner & Elkind).</p> <p>The process of learning to classify objects in accordance with their appearance, behavior and use is greatly facilitated by development of speech and language. Naming is useful to the child in obtaining its wants but though they can often name specific objects, they do not generalize to other similar</p>	<p>Has difficulty tolerating separation from mother or mother figure even for brief periods. Separation is the major source of anxiety in the first two years and prolonged separation may result in serious developmental abnormalities. A sense of trust or mistrust with the world during these first two years have lifelong effects on social orientation (Weiner & Elkind).</p> <p>Games still mainly restricted to the child himself. Still largely presocial (Sandstrom). Contacts playmates physically, but social contacts are few and brief; play is solitary or parallel (i.e. inde-</p>

<p>Make believe play (at its height between 18 months and seven years)-- begins with fragmentary, disjointed bits of pretence. These sequences of actions are symbolic allusions to some newly experienced object; they become assimilated into the child's know-how and form the basis of child thought even before the child can speak (Piaget).</p>	<p>objects or even to the same object in a different setting at this age (Vernon).</p> <p>By end of "sensori-motor period" (approx. 2 years of age) the child has developed from acting in a series of separate spaces to a single coordinated space within which all objects are interrelated. Can now move freely and confidently through a limited spatial terrain. But this is a space of action--a child only gradually develops the ability to form mental representations ("images") of the larger environment. Orientation to the environment is egocentric (Piaget).</p>	<p>pendent from the play of others even when proximate to them) (Fischer and Fischer).</p>
<p>THE THIRD YEAR OF LIFE</p>		
<p>Walks erect, sure, and nimble. Runs more smoothly, but usually walks rather than runs. Can throw ball without losing balance. Enjoys motor activity, but less exclusively so. Can ride a kiddy-car with primitive propulsion. Runs ahead or lags when walking on street (Gesell).</p> <p>Area of free movement increases gradually; until 3-4 years this may be only a few yards adjoining the house or yard. Extent of play away from home is controlled in part by the physical environment (some environments more dangerous) and by social environment (some kids live greater distances from friends whom they might visit) (Fischer and Fischer).</p> <p>By 3 years, can ride a tricycle (Gesell).</p>	<p>During the "pre-operational period" as defined by Piaget (2-7 years) a child begins to form mental representations of the environment, e.g. can recall familiar routes, but the child cannot reverse these routes in thought. Therefore, beyond a small familiar home area, a child cannot return to the house without assistance (Hart & Moore).</p> <p>Perceptual discrimination develops further in all domains. Visually, can learn to recognize and label letters and numbers. In many ways, more perceptually sensitive than older children or adults, e.g. knows all scratches and missing parts of toys and the geography of household furniture in minute detail. But, they "center" their perceptual attention, i.e. they tend to restrict their attention to what immediately catches their eye and give short shrift to the less obvious aspects of perceptual configuration (Weiner & Elkind).</p>	<p>Almost any new situation may frighten two year olds. These fears are general reactions to somewhat undifferentiated situations. Only slight changes in a situation, such as starting up of an electric fan, or entrance of a visitor are enough (Bridges).</p> <p>"parallel play" is prevalent. "Associative play" (i.e. when children engage in a game with others, but each one is intent only on his own bit of it) may occur, but truly "cooperative play", in which children join to make something, or play houses and shops, is rare for this age. In "free play", a play-group usually consists of three children at most, and the group does not last long (Miller).</p>

	<p>During the "intuitive period", as defined by Piaget (between the ages of two and seven) children gradually develop a knowledge of the spatial properties of only those areas which they have experienced through their own locomotion. Their's is an "action space" i.e. even though they may not be able to draw a map or describe how to navigate an area, they may be able to find their way around within it. But this is still a very partial ability and their representation of their neighborhood does not form a coordinated whole (Hart & Moore).</p>	
<p>THE FOURTH YEAR OF LIFE</p>	<p>Become more aware of such relations as inside-outside, top-bottom, front-back, on top of, underneath, etc. One reason for young child's penchant for getting into closets, tables, card boxes, etc. is the need to expand and solidify a growing sense of spatial relations (Weiner & Elkind).</p> <p>Still cannot perceive a unity at the same time as discriminating the separate parts of a situation. A cross road for example overwhelms a child of this age (Sandels).</p>	<p>Spends much time "going places" with tricycle or wagon, although these places are within a strictly delimited area close to the home (Fischer and Fischer).</p> <p>When they have a sandbox or sandpit --spends much time making roads, bridges, tunnels, over which toy trucks and cars are run (Fischer and Fischer).</p> <p>Is occupied by sedentary play for longer periods. Crayons enjoyed and finer manipulation of play materials, not just motor activity at gross level, like ball play, as in the 2 year olds (Gesell).</p>
		<p>Much better able to accept mother's temporary absence and to engage in/play other children. Many children show almost abrupt change--suggests some maturational threshold. Increasingly able to accept surrogate attachment--figures e.g. school teacher; they must be familiar people preferably known through mother, still needs to be aware of where mother is and confident that contact can be resumed with her at short notice (Bowlby). This continues as an important dynamic throughout childhood which is only gradually reduced in strength.</p> <p>Increased interaction with, and affection for, the father (Weiner & Elkind).</p> <p>At 3, a child is able to use words as symbols and to fit words to actions, and actions to words: very important socially--likes to make new friends (Sandstrom).</p> <p>Playmates become important for children. Co-operative play is now more possible due to improved communication, and ability to attend to more than one person at a time.</p>

<p>A nursery-school setting may become a particularly valuable supplement for play with peers, particularly if there are few children in the immediate neighborhood. Two-thirds of play companions are of same sex (Millar, Cratty).</p>		
<p>THE FIFTH YEAR OF LIFE</p>		
<p>Assertive and expansive but emotionally as well as intellectually will return to home base--does not get detached from his or her moorings. Constantly going out to meet the environment in a harm-scarum manner. (Gesell). Likes to hold parent's hand when walking (Bowlby)</p> <p>Shows less enjoyment in solitary or purely parallel types of play, and there is a preference for a group of 2 or 3 children. Shares possessions brought from home (Gesell).</p> <p>When attending nursery school, during school hours, plays with the same age children, but after school or in vacation will tag behind school kids "who descend to pay them some attention if they are not too busy" (Fischer and Fischer).</p> <p>Three and four year olds show more specific fears than 2 year olds. May avoid dogs or certain children, refuse to climb the jungle gym but only gross changes, especially those affecting the child's person such as heavy falls, commonly arouse fear in these older children (Bridges).</p> <p>By age 5, a play group may consist of four or five children but not yet well adapted socially (Millar)</p> <p>Two sexes play together more frequently but uni-sex groups are still dominant.</p>	<p>During school years, perceptual organization is most thoroughly developed. Moves away from simple discrimination and figure-ground patterning to complex organizations which the child imposes on a visual figuration. Perception is also much more rapid than in pre-school years (Weiner & Elkind).</p> <p>Only half of children of this age master the concepts of left and right, so important in the understanding of traffic rules for example (Sandels).</p>	<p>Assertive and expansive, very active, covering more ground--dashes on tri-cycle. Enjoys balancing activities. Prefers large blocks--makes more complicated structures. Throws ball overhand (Gesell).</p> <p>Most are allowed to cross a quiet stretch to play but mostly stay in own or neighbour's yard till they begin school. Crossing streets which have been forbidden and going long distances from home without permission are severely punished (Fischer and Fischer).</p>

THE SIXTH YEAR OF LIFE

Is poised and self controlled; well-oriented to himself. Gross motor activity is well-developed. At beginning of period, loves tricycle and is fast and adept at it. Later desires to discard tricycle for bicycle. Climbs with sureness. Loves to help around the house. At 5½ restless at home, indoors or outdoors--not sure where he wants to be (Gesell).

Active, vigorous games preferred more by boys than by girls from this age on (Willar).

Enjoys group projects--construction of houses, garages, and city planning. Blocks--highly favored by boys and girls. Boys build houses and roads, trucks, bridges, tunnels, and use houses for trucks, cars, etc. Girls build big houses or tents. Likes to finish what has been started. Dolls liked by boys and girls. Also, tricycle, blocks, train (Gesell).

Self-contained; on friendly and familiar terms with environment.

Consolidates gains before making deeper incursions into unknown. Mother center of universe, if it has a center. Not pioneering--the familiar world is still new (Gesell).

Clearly differentiated from earlier years. Now has more self-confidence, trust in others, and is socially more adaptive (Sandström).

Plays in groups of 2-5 with a new sociability. Enjoys group projects, e.g. construction of houses, garages, city planning (Gesell).

Not fearsome age except fear of being deprived of mother--this keeps her at home even when child sleeps (Gesell).

THE SEVENTH YEAR OF LIFE

Active age--almost constant activity. Seems to be consciously balancing the body in space. Much boisterous play. Swings with more freedom. Over extends in much motor behavior (Gesell).

A return to earlier interest in earth and water. Boys especially like digging fox holes, and tunnels with roofs of board. May begin garden (Gesell).

Sex differences in choice of play becoming more clear, but in gross motor and imaginative play very similar; tear around in running games like tag and hide and seek, roller skates, swim. Both like ball play; girls apt to bounce them and boys begin baseball. Girls--jump rope (Gesell).

Not until approximately 7 years of age, do children develop a visual acuity of 20/20 (Kidd and Rivoire).

Not until 7-8 years that they have a demand for common rules in their play; these rules are indistinct and easy to change (Piaget). We may expect the same with children in traffic (Sandels).

A 7 or 8 year old child recognizes that the same landscape may appear different to people in different positions.

In this period, the child surrenders much of the previous dependence on parents and home. Peer groups develop. These are informal play groups with few (if any) rules, little hierarchy, and a shifting membership (Weiner & Elkind). This is a transitional age prior to the "gang-age".

At 6, socially brusque and conflict with peers is common (Sandström).

Teacher strengthens sense of security in "strange world beyond the home". Gains confidence from protectiveness of a partially standardized environment. Because he or she is making discoveries, a few fixed points are important--has to acquire emotional attachment to school (Gesell).

<p>Pretend play enriches play life. Doll play at peak. Playing house. Boys more likely to play wars, cops and robbers and transportation play, but some may also show interest in games using blocks. Collections begin (Gesell).</p>		<p>Aware of upper and lower regions. Boys particularly frequently afraid of cellars and attics. Afraid of dark, because it destroys all spatial relationships (Gesell). Animals are the most commonly mentioned fear of children when asked. One third of children under seven admit to fear of the dark. Very few report fears of the type which parents try to teach--traffic, germs, and kidnappers, etc. (Maurer). May fear high places and unfamiliar impressions--cellars and attics, ghosts and creatures (Gesell).</p>
<p>THE EIGHTH YEAR OF LIFE</p>		
<p>Appears less brisk but has sudden spurts of high activity. More continuous in new performances, e.g. climbing. Repeats performances to master skills. Has "runs" on one type of activity and shows extremes in outdoors play, either tearing about or hanging around. Boys are especially interested in acquiring ball skills (Weiner & Eikind).</p>	<p>A child's representations of the physical environment become more coordinated with the onset of Piaget's period of "concrete operations" (approx. 8-12 years); the child develops the ability to think of environments in a map-like manner and to orient using a coordinated system of reference (Hart & Moore).</p>	<p>Calm periods and longer periods of self-absorption (Gesell). At 7, a certain tranquility is achieved--a developing sense of ethical conduct--rules of the game (Sandström).</p>
<p>Expert tree climber. Many ride bikes but not off sidewalk--can ride for some distance. Winter stamina better: skiing, sliding in group play. There is less pretence and more "things" in the play. Great individual differences. Indoors--shows obsessive tendency in play manias for guns, funny books and coloring. Can spend hours at one thing. Has more capacity for play alone. Fewer novel adventures but better planning. Boys: model and blue print comprehension and therefore inventing and making things from odds and ends. Girls may invent dresses for dolls (Gesell).</p>		

THE NINTH YEAR OF LIFE

The 8 year old is graceful and often poised, with fluid movements of the body. Very much "on the go"--runs, jumps, wrestles, is courageous and daring. Likes doing many things and has some idea of a finished product but does not yet have the sustaining power of a 9 year old; leaving many things uncompleted (Gesell).

Abhors playing alone. Action is the key characteristic. Gross motor activity is characteristic of group play--gets out of bounds, running, jumping, wrestling, climbing. Capable of organizing simple war games or hide and seek. Responds well to some supervised control, is now a good spectator as well as performer. Boys and girls like baseball and soccer, skating, jumping and swimming. Hut play which may have begun earlier, persists longer--may be secret passwords. Enjoys seasonal sports e.g. marbles in spring. Urge to collect, classify, arrange and organize e.g. dolls for girls, stamps and box tops for boys (Gesell).

From 8 years on, toys become less important than tools and realistic implements. All forms of sports are favorites. Organized games with simple rules are preferred, i.e. cowboys and Indians, ball games and roller skating (Millar).

Due to children's inferior size, vision, hearing, intellect and ability to concentrate we cannot expect traffic maturity equivalent to adults--until 9-12 years. Traffic maturity sufficient for cycling appears at an even later age (Sandels).

Expansive again but on higher level of maturity. Has an outgoing contact with his environment (Gesell).

Very active in groups of friends but these groups keep together for only a short time. Not yet ready for complicated social rules and conventions (Gesell).

8 to 12 year olds dislike playing on their own. This is the "gang age". Boys and girls segregate. Differences between boys and girls in the desire for active vigorous games more noticeable than before 8 years of age (Millar).

Space fears (i.e. cellars and attics, etc.) at home now under control (Gesell).

THE TENTH YEAR OF LIFE

The 9 year old works and plays hard. Is more skillful in motor performance and is apt to overdo--e.g. rides bike too far or mows lawn till exhaustion. Wants to do endlessly what is enjoyed and spends much time in solitary

Self motivation the chief characteristic-- capacity to budget time and energy (Gesell).

No fears but a great worrier (Gesell).

activities. Tries to improve skills more purposefully now e.g. some pore over maps and draw them. Has a great interest in competitive sports--baseball is a favorite for boys and girls. Skating, swimming, sliding also enjoyed (Gesell).

At 9, is more stable and has a better integrated social behavior. Demands independence in the home, hence often called a "difficult" age by parents. Sometimes friends mean more than parents e.g. Cubs and Brownies may be more appealing than family trips (Weiner & Elkind).

Segregation of sexes continues--attitude of contempt may develop between the two groups (Weiner & Elkind). As girls approach puberty they become more poised and socially informal (Gesell).

APPENDIX B

Table B-1

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF GRADE LEVEL AND MOORE'S SCORE OF SPATIAL ORGANIZATION (χ^2)

	LEVEL OF SPATIAL ORGANIZATION			
	Level 1	Level 2	Level 3	Total
Grades P-1	5	12	2	19
	3	13	6	22
Grades 3-4	1	8	13	22
Total	9	33	21	63
$\chi^2 = 12.672$	df = 4		p = < .01	

Table B-2

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF SEX AND MOORE'S SCORE OF SPATIAL ORGANIZATION (χ^2)

	LEVEL OF SPATIAL ORGANIZATION			
	Level 1	Level 2	Level 3	Total
Boys	3	17	14	34
Girls	6	16	7	29
Total	9	23	21	63
$\chi^2 = 7.368$	df = 4		p = < .05	

Table B-3

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF GRADE LEVEL AND
LEVEL OF SPATIAL ORGANIZATION (χ^2)

A LEVEL OF SPATIAL ORGANIZATION WITHIN CLUSTERS						
	Level of Spatial Organization					Total
	1	2	3	4	5	
Grades P-1	0	4	8	4	3	19
Grade 2	0	3	3	7	9	22
Grades 3-4	0	1	2	7	12	22
Total	8	31	24			
$\chi^2 = 7.424$ $df = 4$ $p = < .05$						

B LEVEL OF SPATIAL ORGANIZATION BETWEEN CLUSTERS						
	Level of Spatial Organization					Total
	1	2	3	4	5	
Grades P-1	1	9	0	5	6	19
Grade 2	3	0	8	1	18	22
Grades 3-4	1	1	3	3	16	22
Total	15	20	63			
$\chi^2 = 14.656$ $df = 4$ $p = < .01$						

C INTEGRATED SCORE OF SPATIAL ORGANIZATION				
	Level of Spatial Organization			Total
	1	2	3	
Grades P-1	10	7	2	19
Grade 2	6	8	8	22
Grades 3-4	2	7	13	22
Total	18	22	23	63
$\chi^2 = 13.465$ $df = 4$ $p = < .01$				

Table B-4

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF GRADE LEVEL AND
COMPOSITE SCORE OF SPATIAL ORGANIZATION AND EXTENT (x^2)

	SCORE OF SPATIAL ORGANIZATION AND EXTENT			Total
	0-50	50.01-100	100.01	
Grades P-1	16	2	1	19
Grade 2	7	13	2	22
Grades 3-4	5	7	10	22
Total	28	22	13	63
$x^2 = 20.587$ $df = 4$ $p = < .001$				

Table B-5

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF GRADE LEVEL AND
LEVEL OF SPATIAL ORGANIZATION OF EACH CHILD'S "HOME CLUSTER" (x^2)

	LEVEL OF SPATIAL ORGANIZATION			Total
	Levels 1-2	Levels 3-4	Level 5	
Grades P-1	4	3	12	19
Grade 2	0	6	16	22
Grades 3-4	0	5	17	22
Total	4	14	45	63
$x^2 = .0.169$ $df = 4$ $p = < .05$				

Table B-6

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF GRADE LEVEL AND
EXTENT OF AREA MAPPED IN CLUSTERS (x^2)

	EXTENT OF AREA MAPPED				Total
	Level 1	Level 2	Level 3	Level 4	
Grades P-1	14	4	1	0	19
Grade 2	3	15	4	0	22
Grades 3-4	1	11	4	6	22
Total	17	25	8	5	63
$x^2 = 43.157$ $df = 6$ $p = < .01$					

Table B-7
 LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF SEX AND
 LEVEL OF SPATIAL ORGANIZATION (χ^2)

A AVERAGE LEVEL OF SPATIAL ORGANIZATION WITHIN CLUSTERS						
	1	2	3	4	5	Total
Boys	0	1	8	7	18	34
Girls	0	7	5	11	6	39
Total	8		31		24	63
$\chi^2 = 11.118$ $df = 2$ $p = < .005$						

B LEVEL OF SPATIAL ORGANIZATION BETWEEN CLUSTERS						
	1	2	3	4	5	Total
Boys	1	4	7	3	19	34
Girls	4	6	4	6	9	29
Total	15		20		28	63
$\chi^2 = 4.870$ $df = 2$ $p = < .10$						

C INTEGRATED SCORE OF SPATIAL ORGANIZATION				
	0-50	50.01-100	100	Total
Boys	7	11	16	34
Girls	11	11	7	29
Total	18	22	23	63
$\chi^2 = 4.038$ $df = 2$ $p = < .25$				

D COMPOSITE SCORE OF SPATIAL ORGANIZATION AND EXTENT				
	0-50	50.01-100	100	Total
Boys	10	15	9	34
Girls	16	9	4	29
Total	26	24	13	63
$\chi^2 = 4.436$ $df = 2$ $p = < .25$				

Table B-8

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF SEX AND LEVEL OF SPATIAL ORGANIZATION OF EACH CHILD'S "HOME CLUSTER"

	LEVEL OF SPATIAL ORGANIZATION			Total
	Levels 1-2	Levels 3-4	Level 5	
Boys	1	4	29	34
Girls	3	10	16	29
Total	4	14	45	63
$\chi^2 = 6.975$		df = 2	p = < .05	

Table B-9

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF SEX AND EXTENT OF AREA MAPPED IN CLUSTERS (χ^2)

	EXTENT OF AREA MAPPED				Total
	1	2	3	4	
Boys	6	18	7	3	34
Girls	12	12	2	3	29
Total	18	30	9	6	63
$\chi^2 = 5.616$		df = 3	p = < .25		

Table B-10

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF I.Q. AND
INTEGRATED SCORE OF SPATIAL ORGANIZATION (χ^2)

SCORE OF SPATIAL ORGANIZATION

I.Q.	Level 1	Level 2	Level 3	Total
70-85	1	2	0	3
86-100	4	4	5	13
101-115	3	5	8	16
116-130	1	3	4	8
131-145	0	0	2	2
Total	9	14	19	42

$\chi^2 = 6.195$

df = 8

p = < .75

Table B-11

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF SPATIAL RANGE
AND MOORE'S SCORE OF SPATIAL ORGANIZATION (χ^2)

A

LEVEL OF SPATIAL ORGANIZATION

Range with permission	Level 1	Level 2	Level 3	Total
0-400 yds.	5	8	1	14
401-800 yds.	1	10	7	18
801 yds.	1	6	12	19
Total	7	24	20	51

$\chi^2 = 14.791$ $df = 4$ $p = < .01$

B

LEVEL OF SPATIAL ORGANIZATION

Range with others	Level 1	Level 2	Level 3	Total
0-400 yds.	2	2	1	5
401-800 yds.	2	14	2	18
801 yds.	3	8	17	28
Total	7	24	10	51

$\chi^2 = 15.878$ $df = 4$ $p = < .005$

Table B-12

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF RANGE AND
INTEGRATED SCORE OF SPATIAL ORGANIZATION (x^2)

A.

FREE RANGE	SCORE OF SPATIAL ORGANIZATION			Total
	1	2	3	
0-400 yds.	12	16	13	41
401-800 yds.	0	2	4	6
\geq 801 yds.	0	0	4	4
Total	12	18	21	51

$$x^2 = 9.709 \quad df = 4 \quad p = < .05$$

B.

RANGE WITH PERMISSION	SCORE OF SPATIAL ORGANIZATION			Total
	1	2	3	
0-400 yds.	6	6	2	14
401-800 yds.	4	7	7	18
\geq 801 yds.	1	5	13	19
Total	11	18	22	51

$$x^2 = 11.606 \quad df = 4 \quad p = < .025$$

C.

RANGE WITH OTHERS	SCORE OR SPATIAL ORGANIZATION			Total
	1	2	3	
0-400 yds.	3	1	1	5
401-800 yds.	5	9	4	18
\geq 801 yds.	3	8	17	28
Total	11	18	22	51

$$x^2 = 11.525 \quad df = 4 \quad p = < .025$$

Table B-13

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF RANGE WITH
PERMISSION AND EXTENT OF AREA MAPPED IN CLUSTERS (χ^2)

RANGE	EXTENT OF AREA MAPPED				
	Level 1	Level 2	Level 3	Level 4	Total
0-400 yds.	10	3	1	0	14
401-800 yds.	2	13	2	1	18
\geq 801 yds.	1	9	4	5	19
Total	13	25	7	6	51
$\chi^2 = 27.191$	df = 6		p = $< .001$		

Table B-14

LANDSCAPE MODEL TEST: CONTINGENCY TABLE OF INTEGRATED
SCORE OF SPATIAL ORGANIZATION AND EXTENT OF AREA MAPPED IN CLUSTERS (χ^2)

INTEGRATED SCORE	EXTENT OF AREA MAPPED IN CLUSTERS				
	1	2	3	4	Total
LEVEL 1	13	5	0	0	18
LEVEL 2	5	14	3	0	22
LEVEL 3	0	11	6	6	23
TOTAL	18	30	9	6	63
$\chi^2 = 36.77$	df = 6		p = $< .001$		

Table B-15 (A)

DETAILED ACCOUNT: PLACE PREFERENCE - INTERVIEWS
 LAND-USE GRADE LEVEL

	K-3		4-7			K-7	
	G	B	G	B	G	B	
TOWN CENTER BALL FIELD % of total =	4	12	12	13	16	25	
FORTS AND HOUSES % of total =	4	15	13	1	17	16	
RIVERS % of total =	6	8	8	5	14	13	
FIELDS (Exploring, etc.) % of total =	6	4	8	3	14	7	
LAKES % of total =	3	4	8	5	11	9	
WOODS % of total =	0	8	4	5	4	13	
CHILD'S BALL FIELD % of total =	2	3	4	4	6	7	
ANIMAL BARN/FIELD % of total =	0	7	5	0	5	7	
INSIDE HOME % of total =	7	0	3	1	10	1	
BROOK-FROG POND % of total =	0	2	5	2	5	4	
STREETS (Cycling) % of total =	2	0	2	5	4	5	
POOL % of total =	2	1	2	2	4	3	
LAWNS % of total =	2	2	3	0	5	2	
SLIDING PLACES % of total =	1	1	2	2	3	3	
PARKING LOTS/DRIVES % of total =	0	1	2	3	2	4	
SAND PILES (Dirt play) % of total =	2	3	0	1	2	4	
TREES (Climbing) % of total =	2	2	0	0	2	2	
SNOWMOBILE-FIELD/TRAIL % of total =	0	1	2	0	2	1	
FRUIT-TREES/BUSHES % of total =	0	2	1	0	1	2	

Table B-15 (A) (cont'd)

JUMPING PLACES % of total =	1	1	0	1	1	2
CLIMBING PLACES % of total =	0	1	0	1	0	2
PATHS % of total =	0	0	2	0	2	0
GRAVEYARD % of total =	0	0	1	1	1	1
ROPESWING % of total =	1	1	0	0	1	1
SCARY-HAUNTED HOUSES % of total =	0	1	1	0	1	1
ROCK % of total =	1	1	0	0	1	1
BACKYARD (Equipment) % of total =	1	1	0	0	1	1
MINIBIKE TRAIL % of total =	0	1	0	1	0	2
FIELD (Snow play) % of total =	1	1	0	0	1	1
LOOK-OUT PLACES % of total =	0	1	0	0	0	1
STREET GAMES % of total =	0	0	0	1	0	1
FAIRGROUND % of total =	0	1	0	0	0	1
ROAD (Walking) % of total =	0	0	1	0	1	0
TENNIS COURT % of total	0	0	0	1	0	1
HAYSTACK % of total =	1	0	0	0	1	0
ROLLING PLACE % of total	0	1	0	0	0	1
TOTAL % of total =	49	86	89	58	138	145
NUMBER OF PLACE PREFERENCE INTERVIEWS	12	21	17	15	19	36

Table B-15 (B)
 DETAILED ACCOUNT: PLACE PREFERENCE - INTERVIEWS
 COMMERCIAL PLACES

	GRADE LEVEL										
	G	K-3	B	G	4-7	B	G	K-7	B		
STORES IN TOWN	12		9	6		8	18		17	37.50	28.91
ICE CREAM STAND	7		8	8		7	15		15	31.25	25.42
UNIVERSAL SUPERMARKET	2		2	5		6	7		8	14.58	13.56
RESTAURANTS	2		4	2		1	4		5	8.33	8.56
STORES OUT OF TOWN	0		4	0		2	0		6	0.00	10.77
GAS STATIONS	0		3	0		1	0		4	0.00	6.78
LIBRARY	0		1	1		0	1		1	2.08	1.69
POST OFFICE	1		1	0		0	1		1	2.08	1.69
FIRE STATION	0		1	0		1	0		2	0.00	3.39
BANK	1		0	0		0	1		0	2.08	0.00
DOCTOR	1		0	0		0	1		0	2.08	0.00
TOTAL	26		33	22		26	48		59	100%	100%
NUMBER OF PLACE PREFERENCE INTERVIEWS	12		21	17		15	29		36		

Table B-15 (C)

DETAILED ACCOUNT: PLACE PREFERENCE - INTERVIEWS
SOCIAL

	GRADE LEVEL					
	K-3		4-7		K-7	
	G	B	G	B	G	B
CHILD'S HOME	27	41	30	32	57	73
					57	67
ADULT'S HOME	8	7	10	3	18	10
					18	9
ELEMENTARY SCHOOL	4	4	1	1	5	5
					5	4.5
PARENTS' WORK PLACE	0	5	1	4	1	9
					1	8
HIGH SCHOOL	3	4	0	1	3	5
					3	4.5
RECREATION PROGRAMS	2	0	4	1	6	1
					6	1
BOWLING ALLEY	1	1	2	2	3	3
					3	3
CHURCHES	4	1	3	2	7	3
					7	3
TOTAL	49	63	51	46	100	109
NUMBER OF PLACE PREFERENCE INTERVIEWS	12	21	17	15	19	36

Table B-16 (A)

DETAILED ACCOUNT: PLACE PREFERENCE - EXPEDITIONS
LAND-USE

	* K/1-3/4		* 4/5-6/7		* K/1-6/7	
	G	B	G	B	G	B
RIVERS	2	8	4	5	6	13
FIELD/LAWN	1	5	2	8	3	13
FORTS (BUILDINGS BY CHILDREN	2	4	10	2	12	6
TOWN CENTER BALLFIELD	1	5	1	4	2	9
LAKES	1	1	3	4	4	5
SLIDING PLACES	0	2	4	1	4	3
TREES (CLIMBING)	2	3	3	1	5	4
FROG POND	1	2	1	1	2	3
LOOK-OUT PLACES	1	4	0	0	1	4
SWINGSET (ETC.)	0	3	2	0	2	3
WOODS	0	3	0	1	0	4
ROCK	1	1	2	0	3	1
FAIRGROUND	2	0	2	0	4	0
HIDING PLACES	1	1	2	0	4	0
FRUIT TREES/BUSHES	0	3	1	0	1	3
ANIMAL PLACES	1	1	0	0	1	1
UNDERNEATH TREES	0	0	3	0	3	0
TOTAL	16	46	40	27	56	73

Table B-16 (B)

DETAILED ACCOUNT: PLACE PREFERENCE - EXPEDITIONS
COMMERCIAL PLACES

	GRADE LEVEL					
	K [*] /1-3 [*] /4		4 [*] /5-6 [*] /7		K [*] /1-6 [*] /7	
	G	B	G	B	G	B
ICE CREAM STAND	3	5	3	2	6	7
TOWN CENTER STORES	2	2	2	3	4	5
RESTAURANTS	0	1	1	2	1	3
OTHER STORES	1	1	0	1	1	2
TOTAL	6	9	6	8	12	17

Table B-16 (C)

DETAILED ACCOUNT: PLACE PREFERENCE - EXPEDITIONS
SOCIAL PLACES

	GRADE LEVEL					
	K [*] /1-3 [*] /4		4 [*] /5-6 [*] /7		K [*] /1-6 [*] /7	
	G	B	G	B	G	B
CHILD'S HOME	5	12	5	4	10	16
HIGH SCHOOL	1	2	0	1	1	3
ELEMENTARY SCHOOL	2	1	2	0	4	0
ADULT'S HOME	2	0	2	0	4	0
PARENT'S WORK	0	1	1	1	1	2
TOTAL	10	16	8	6	18	22

Table B-17 (A)

DETAILED ACCOUNT: WEEK DIARIES - PLACES MENTIONED
LAND-USE

	* K/1-2/3		* 3/4-6/7		TOTAL	
	G (N=4)	B (N=6)	G (N=9)	B (N=6)	G (N=13)	B (N=17)
STREETS, ETC. FOR CYCLING	2	6	11	38	13	44
"OUTSIDE HOME"	9	15	3	6	12	21
CHILD'S BALLFIELD	1	7	10	5	11	12
DRIVEWAY (FRONT OF HOME)	9	9	0	2	9	11
RIVERS	0	7	12	0	12	7
SANDPILES	7	7	4	0	11	7
FORTS	1	10	4	1	5	11
TOWN CENTER BALLFIELD	1	1	4	8	5	9
LAKES	2	4	2	4	4	8
GARDEN	0	2	6	1	6	3
CLIMBING TREES	2	2	0	3	2	5
PAPER ROUTE	0	0	0	6	0	6
STREET GAMES	0	4	0	1	0	5
FRUIT TREES AND BUSHES	1	3	2	0	3	3
SWING SETS	2	1	0	0	2	1
WALKING THE DOG	0	0	3	0	3	0
LIBRARY LAWN	0	0	0	2	0	2
ANIMAL PLACE	0	0	1	1	0	1
BUILDING SOMETHING	1	0	0	1	0	1
WALKING ON ROAD	0	0	0	1	0	1
PLAYING IN A CAR	0	1	0	0	0	1
SPRINKLER	0	1	0	0	0	1

Table B-17 (A) (cont'd)

LOOK-OUT PLACE	0	1	0	0	0	1
PATH	0	1	0	0	0	1
WOODS	0	0	1	0	1	0
UNDERNEATH TREES	0	0	0	1	0	1
POOL	0	0	0	1	0	1
TOTAL	38	83	63	81	99	164

Table B-17 (B)

DETAILED ACCOUNT: WEEK DIARIES - PLACES MENTIONED
COMMERCIAL

	K [*] /1-2/3		3 [*] /4-6/7		TOTAL	
	G (N=4)	B (N=6)	G (N=9)	B (N=6)	G (N=13)	B (N=17)
STORES IN TOWN	3	0	24	18	27	18
POST OFFICE	6	0	18	5	24	5
SUPERMARKET	5	0	8	6	13	6
RESTAURANTS	4	3	7	3	11	6
HEALTH CENTER	2	0	4	1	6	1
DUMP	2	1	1	1	3	2
GAS STATIONS	0	1	2	2	2	3
FIRE STATIONS	0	0	0	4	0	4
BANK	2	0	0	2	2	2
"DOWNSTREET"	0	0	1	2	1	2
LAUNDROMAT	1	0	1	0	2	0
POLICE STATION	0	0	0	1	0	1
TOTAL	25	5	66	45	91	50

Table B-17 (C)

DETAILED ACCOUNT: WEEK DIARIES - PLACES MENTIONED
SOCIAL

	K [*] /1-2/3 [*]		3 [*] /4-6/7 [*]		TOTAL	
	G (N=4)	B (N=6)	G (N=9)	B (N=6)	G (N=13)	B (N=17)
HOME (CHILD)	19	19	24	25	43	44
HOME (ADULT)	17	8	10	4	27	12
PARENTS' WORKPLACE	2	0	5	6	7	6
CHURCH	4	2	3	1	7	3
OWN PORCH	4	0	0	0	4	0
HIGH SCHOOL	1	0	2	0	3	0
BOWLING ALLEY	0	1	1	0	1	1
ELEMENTARY SCHOOL	0	0	1	0	1	0
MEMORIAL HALL	1	0	0	0	1	0
TOTAL	48	30	46	36	94	66

Table B-18 (A)

DETAILED ACCOUNT: WEEKEND DIARIES - PLACES MENTIONED
LAND-USE

	K [*] 1-2/3		3 [*] /4-6/7		TOTAL	
	G (N=10)	B (N=9)	G (N=13)	B (N=11)	G (N=23)	B(N=20)
"OUTSIDE HOME"	7	7	12	6	19	13
DRIVEWAY - FRONT OF HOME	1	8	6	2	7	10
YARD/FIELD/LAWN	3	1	4	8	7	9
LAKES	2	2	8	4	10	6
SANDPIT	3	1	1	1	4	2
TOWN CENTER BALLFIELD	0	3	1	2	1	5
RIVERS	1	0	3	1	4	1
POOL	0	1	2	0	2	1
BARN	0	2	0	0	0	2
POND	0	0	0	1	0	1
GARAGE	0	0	0	1	0	1
TOTAL	17	25	37	26	54	51

Table B-18 (B)

DETAILED ACCOUNT: WEEKEND DIARIES - PLACES MENTIONED
COMMERCIAL

	K [*] /1-2 [*] /3		3 [*] /4-6 [*] /7		TOTAL	
	G (N=10)	B (N=9)	G (N=13)	B (N=11)	G (N=23)	B (N=20)
RESTAURANTS	4	1	4	0	8	1
STORES (IN TOWN)	0	1	1	2	1	3
HEALTH CENTER	1	0	1	0	2	0
SUPERMARKET AND LAUNDROMAT	1	0	0	0	1	0
POST OFFICE	1	0	0	0	1	0
TOTAL	7	2	6	2	13	4

Table B-18 (C)

DETAILED ACCOUNT: WEEKEND DIARIES - PLACES MENTIONED
SOCIAL

	K [*] /1-2 [*] /3		2 [*] /3-6 [*] /7		TOTAL	
	G (N=10)	B (N=9)	G (N=13)	B (N=11)	G (N=23)	B (N=20)
HOME (CHILD)	6	1	7	10	13	11
HOME (ADULT)	1	7	0	1	1	8
CHURCH	1	0	0	0	1	0
PARENTS' WORKPLACE	0	1	0	0	0	1
TOTAL	8	9	7	11	15	20

APPENDIX C

CHILD-ENVIRONMENT SURVEY: CONFIDENTIAL

- 1a. Are there any places your child considers his/her own? (include places in or around the home and more distant places).
- 1b. What does s(he) do there?
- 1c. How does s(he) let other people know s(he) thinks it his/her own place?
- 1d. Does s(he) let other people go there? Who?
- 2. Are there any other places your child is especially attached to, or which are precious to him/her?
- 3. Are there any places s(he) goes to when s(he) wants to be alone?
- 4. Are there any places that your child is frightened or afraid of?
- 5a. What places do you allow your child to go alone without asking permission each time from you? (Use the same words you use with your children please). NB: At this point the interviewer will introduce the aerial photograph and use it as a guide with the mother in answering this question.
- 5b. Any different on a bicycle?
- 6a. What places do you allow your child to go to alone but with permission from you?
- 6b. Any different on a bicycle?
- 7a. What places do you allow your child to go to with children of the same age?
- 7b. Any different on a bicycle?
- 8. What places do you allow your child to go to with older children?

place	who with	age

- 9. Are these rules followed by your child?
- 10. Why do you limit the child's range?
- 11. Would your husband have answered any of these questions differently (if administered to the mother only)?
- 12a. Do you ever worry about your child getting lost?
- 12b. Does this influence the limits you place on how far your child can go?
- 12c. What areas do you believe s(he) knows well enough to be able to return home by him/herself without getting lost?
- 13. Are there any places in Inavale which you consider dangerous or unsafe for your children?
- 14. What places does your child play at the most? (include places outside of the village where they must be taken by you).

	where	how often	usual activities	who with
Summer				
Winter				

- 15a. Which of these (above) places do you most like him/her to play at? (check)
- 15b. Which of these (above) places do you least like him/her to play at? (cross)

16. What places does the child frequently visit with you?

where	how	how often	purpose	childs activity

17a. Do you ever take your child to play with other children?

where	who with	how often	do you stay

17b. Do other parents ever bring children here to play with your child?

where from	who	how often	do they stay

17c. Do you ever collect other children to come here to play?

where from	who	how often

18. What places outside of Inavale has your child visited with you or with others?

place	how many times	purpose	who with

19. At what age did your child receive:

3 wheel bicycle? _____
2 wheel bicycle? _____
mini-bike? _____
ski-mobile? _____

20. How long have you lived in Inavale?

21. Have you lived anywhere else in Inavale?

22. Where did you live before Inavale?

23. Is there anything about this place and the surrounding area which is not suitable in your mind for children?

24. What changes would you like to see made to improve this environment for your children if there were no financial difficulty, either by your family or by the town?

25. Where would you most like to live in town if you had the ability to move anywhere you wished:

a. For your child(ren) only? b. For yourself only?

APPENDIX D

INSTRUCTIONS TO JUDGES

I would like you to make some judgements about the accompanying sketch maps of Inavale. The judgements involve sorting the maps into categories on the basis of the degree of coordination of spatial relations within each map.

The maps are copies of models built by elementary school children. Each child was asked to "Build all the places you know, beginning with your home, and including your school." Each child was encouraged to include as many different places as possible.

Occasionally subjects mentioned that distortions were present in their models (e.g., shortening a long street or making an angle too big in relation to other things), and they were not interested in changing it. In such cases I indicated this fact by written notes on the outline maps of the model. Similarly, if things were squeezed onto the edge of the sheet or roads were bent, notes to this effect were likewise made. These changes should be considered part of the final map and the distortions or inaccuracies not so noted should be considered errors.

Your task is the following. Each map is to be sorted into one of several categories in accordance with the criteria and instructions which follow. There are four different things to be done (A to D of the instructions). Please do not go on to any succeeding part until you have completed the preceding ones and recorded your decisions on the forms provided. Do not pay attention to any knowledge you may have about the child external to the model maps they each created or to any other factors not mentioned explicitly in the criteria. Please use this detailed map of Inavale showing the locations of all buildings should you not be sure of anything. Please read the criteria carefully and refer to them as often as necessary in making your judgements.

PLEASE READ THE SET OF PAGES ON CRITERIA BEFORE CONTINUING TO THE NEXT PAGE.

Instructions and Scoring Sheets

Judge's Name: _____

A. Initial Sort

Instructions: Please read the criteria for sorting the maps. Look through all maps before making any judgements. Then sort the maps into four piles. The piles do not need to contain any particular number of maps; indeed, a pile may be empty. When you are finished, please review each pile and make any necessary changes. Then record your decisions below, along with any specific remarks. Record any general comments or observations on the separate

sheets provided (for example, if you see other properties which seem to vary across the maps which are different from the properties to which the criteria refer).

Recording: Please record the code numbers appearing on the bottom right corner of each map in the appropriate column.

LEVEL I TRANSITIONAL LEVEL II TRANSITIONAL LEVEL III

Remarks:

PLEASE DO NOT READ OR GO ON TO THE NEXT PAGE UNTIL YOU HAVE COMPLETED THIS SORT AND RECORDED YOUR DECISIONS.

B. Ordered Sort

Instructions: Now, please order the maps within each pile sequentially from highest to lowest degree of organization. The lowest degree of organization within each pile would be that map most like the next lower level and, conversely, the highest would be that map most like the next higher level, for example, a low order Level II might have only one cluster or two completely unrelated clusters, a low order Transitional might have several clusters which are relatively poorly interrelated, a high order Transitional might be very well coordinated like Level III but with a few distortions, and the highest Level III would be the most accurate, most extensive map.

Recording: Please record sequentially the code numbers for each map within its initial level, and number the final ordering from 1 through 63, where 1 is the poorest organized member of Level I and 63 is the best organized of Level III (again, some categories may not have any maps).

LEVEL I TRANSITIONAL LEVEL II TRANSITIONAL LEVEL III

Remarks:

PLEASE DO NOT READ OR GO ON TO THE NEXT PAGE UNTIL YOU HAVE COMPLETED THIS PAGE.

C. Revised Sort--Elimination of Transitional Levels

Instructions: Next, considering only the maps you initially placed in the Transitional piles, please sort each one into either Level I, Level II, or

Level III, which ever is more appropriate. Refer back to the criteria as necessary.

Recording: For those maps initially in the Transitional categories, please list the code numbers in the appropriate column.

LEVEL I TRANSITIONAL LEVEL II TRANSITIONAL LEVEL III

Remarks:

PLEASE DO NOT READ OR GO ON TO THE NEXT PAGE UNTIL YOU HAVE COMPLETED THIS PAGE.

D. Final Groupings

Instructions: Finally, consider your three remaining groups and please make any changes you now feel are necessary either in level or in order, that is, you may move any map into another pile and/or change the order within piles (of course, you will have to order the former transitional maps with their new levels also).

Recording: Please record your final groupings and order, from lowest to highest, and number from 1 through 51.

LEVEL I TRANSITIONAL LEVEL II TRANSITIONAL LEVEL III

Remarks:

Thank you so very much for your time and effort--without your help I could not have completed this project.

APPENDIX E

SAMPLE TRANSCRIPT FROM THE PLACE RECOGNITION TEST (DAVY ROBINSON)

In the following transcript, D refers to Davy Robinson and R to the author/interviewer. Whenever a reference to the particular color transparency is not clear, explanation is provided in parentheses. Those transparencies for which no identifications of place were made by the child are indicated by parentheses which read "not recognized."

1. The elementary school.

D: "Oh, that's pretty."
R: "You know where that is, right?"
D: "Yeah. The place we're in."
R: "Yes."
D: "See down this end? That's Jo's room."
R: "Is that your sister, Jo?"
D: "Yeah."
R: "You can point with this (pointer) if you want."
D: "Okay."

2. Looking up Greenlawns Hill Road from Snowdon Road.

D: "Oh, I know that. That's Greenlawns Hill."
R: "Greenlawns Hill, uh-huh."
D: "Yep. My father and I went up there one day."
R: "You go around in his truck quite a lot, don't you?"
D: "Yeah."
R: "What were you doing up there?"
D: "We were taking these prickly trees to the dump, to clean it up."

3. Snowdon - Main Street.

D: (No response)
R: "Now, that's outside of Inavale I think so you probably wouldn't know that one."

4. Down Wood Lane from North Hill Road.

D: "I recognize that white dog." (Not recognized)

5. Bear Hill Road from Snowdon Road.

R: "Did you ever see that before do you think?"
D: "I don't know, I think I have. I know where that is."
R: "You do?"
D: "That's going to the lake road?"
R: "To a lake?"
D: "Yeah." (The road leads to Indian Lake.)

6. Snowdon - General Store.

R: "How about that one?"

D: "That's Snowdon General Store. I was with Jean there once and we got some candy and stuff."

7. Plum Hill Road - looking up from the big bend.

D: "I know that! Plum Hill Road!" (The road of his home.)

R: "Yup. Do you know any of these places? What are they?"

D: "I know the um---that one, that one, and that one. We even went to that one and that one when we were trick or treating."

R: "Oh, "trick or treating." Do you know who lives there in any of them?"

D: "Yeah, I think that's Newson's house, right?"

R: "I don't know. I don't know the names of these places, that's why I'm asking you to tell me as much as you can about these pictures."

D: "I know that one and that one. I know but I can't remember the names."

R: "Uh-huh."

D: "That's the Finn's house that blue one up there. (Friend's house.)

R: "Okay, yeah. I knew that one (house) 'cuz Sam Finn told me, but I didn't know the other one."

D: "Yeah."

8. The High School.

D: "I know where that is. The High School."

9. Lake Inavale from Grandville Road.

D: "I know where that is. It's on, going to Grandville. Because that's where they do the (ski) jumping with the boats."

R: "Oh, really?"

D: "Yeah, we watched that. And it's way up high. There used to be a railroad track across (the lake). My father said there used to be a factory across it."

R: "A factory?"

D: "See, there's the train track? And they used to go across it. Then there was a factory."

R: "Oh! I didn't know that."

10. Junction of Lake Road and North Hill Road from the southwest on North Hill Road.

D: "That's going to the Lake Road and I know where this road goes to."

R: "Where?"

D: "Out to Youngton."

R: "The left one, Wood Lane, goes up to Youngton, I see."

11. Plum Hill Road from the farm looking up.

D: "Yeah. There's our house and then you go through the woods and there's

Big Mountain right there and I can even see all of the airplanes 'cuz they put on skis and they take off."

R: "You can see them from near your house?"

D: "Yeah. You look out the back window. We watch them take off; we can't see them take off but when they come out from the trees you can see them."

R: "Oh!"

D: "And you know what? Richard Chancellor lives right near us, and you know what? There's Walter's and oh, I can't remember the other girl's name."

R: "Do you know whose houses those are?"

D: "Yeah, I know that one, that's Elenore's house. And I know that one back there. That's reddish (color). I know them 'cuz he drives trucks. I know whose house that is 'cuz we went down to their house one day and they had a snow mobile and everything. And right here's where Richard Chancellor's is. And see, this is our field. It's really Richard's, but he let's us use it and man, you go in the winter and you can see the grader go right up the hill and it makes these big banks and we go sliding right off there with our 'slide-a-boggans.' "

R: "Oh, that's fun."

D: "We do that in winter, and then you go whoosh about a mile."

R: "Yeah?"

D: "Away from the snow banks, you know what? You get out, and you know what? There's this big swamp and you know what I did? I went right out on it."

R: "On the swamp?"

D: "Yeah, and oh, I got out of there fast."

R: "You were wet, huh?"

D: "I know who lives right there, across it. And then you go over and there's May's. See that? Some of that blue house? That's Smith's."

R: "Uh-huh. Smith's there, and Sam's there, and your field there you said."

D: "Yeah."

R: "Okay."

12. The Middleton Road/Northville Road junction from Middleton Road to the east.

D: "And that's where the Sugar House is. You know what? There's a house down there and my father works with some of those guys, and Jo (sister) loves (giggle) Rick. I know which one this is, it's Middleton Road."

R: "Do you know where this other road leads to?"

D: "Middleton."

R: "This one too?"

D: "This one goes to Middleton and that one goes somewhere."

R: "Somewhere else, huh?"

D: "And you know what? It goes to our friend's barn. You know what? You go down there and there's a road that goes up into this big place where there's some woods. My father's working up there."

Big Mountain right there and I can even see all of the airplanes 'cuz they put on skis and they take off."

R: "You can see them from near your house?"

D: "Yeah. You look out the back window. We watch them take off; we can't see them take off but when they come out from the trees you can see them."

R: "Oh!"

D: "And you know what? Richard Chancellor lives right near us, and you know what? There's Walter's and oh, I can't remember the other girl's name."

R: "Do you know whose houses those are?"

D: "Yeah, I know that one, that's Elenore's house. And I know that one back there. That's reddish (color). I know them 'cuz he drives trucks. I know whose house that is 'cuz we went down to their house one day and they had a snow mobile and everything. And right here's where Richard Chancellor's is. And see, this is our field. It's really Richard's, but he let's us use it and man, you go in the winter and you can see the grader go right up the hill and it makes these big banks and we go sliding right off there with our 'slide-a-boggans.' "

R: "Oh, that's fun."

D: "We do that in winter, and then you go whoosh about a mile."

R: "Yeah?"

D: "Away from the snow banks, you know what? You get out, and you know what? There's this big swamp and you know what I did? I went right out on it."

R: "On the swamp?"

D: "Yeah, and oh, I got out of there fast."

R: "You were wet, huh?"

D: "I know who lives right there, across it. And then you go over and there's May's. See that? Some of that blue house? That's Smith's."

R: "Uh-huh. Smith's there, and Sam's there, and your field there you said."

D: "Yeah."

R: "Okay."

12. The Middleton Road/Northville Road junction from Middleton Road to the east.

D: "And that's where the Sugar House is. You know what? There's a house down there and my father works with some of those guys, and Jo (sister) loves (giggle) Rick. I know which one this is, it's Middleton Road."

R: "Do you know where this other road leads to?"

D: "Middleton."

R: "This one too?"

D: "This one goes to Middleton and that one goes somewhere."

R: "Somewhere else, huh?"

D: "And you know what? It goes to our friend's barn. You know what? You go down there and there's a road that goes up into this big place where there's some woods. My father's working up there."

- D: "That goes to school."
R: "Okay, anything else?"
D: "No, you can go on."
R: "Okay."
18. Townview Drive from junction with North Hill Road.
- D: "Oh, uh, I know where that is. You see, you go that way and that's the Lake Road."
19. Snowdon Road bridge near the Elementary School.
- D: "I know where that is. That's going along to the school."
R: "The school."
D: "Yeah, and that's the river and the bridge. Go on."
R: "Okay."
20. West Main Street near the Post Office.
- D: "Uh, that's going into the Post Office right?"
R: "Uh-huh, I think so. Do you know anything apart from the post office on the picture?"
D: "Um...I know you go down there, then there's a gas station and there's the Universal Supermarket. And that's where Tom Cochrane lives. Okay, you can turn now."
21. East Main Street east of the commercial strip.
- D: "Hey! See that factory? That's where some of it burned."
R: "Oh, that's the one you told me about."
D: "You can go on."
22. East Main Street from the town center.
- D: "That's where we live, 'cuz you go over there, if you go down back there you can go up (the hill) the backway (to his home). And you know what?"
R: "What?"
D: "See, you go down there and see you go over there and that's where the River Restaurant is. And that burned."
R: "Did it?"
D: "Yeah, my father had to go work down there and work on the roof."
R: "Okay. Do you know what any of these other places are?"
D: "Oh, I know something. See that place (Marsden's, the old hotel)? Daddy was working in it one time. It's got a big elevator and I went on it. That was fun, 'cuz I think I went alone on it and then well, you just go and you stand in there like this and all of a sudden, BOING! -- and you think you're going up."
R: "Anything else?"
D: "Um...that's the Bridge Diner."
R: "Uh-huh."
D: "And you go down the road there and then you'll find that there's the

- 'Old Trader's' store."
 R: "Oh."
 D: "Then there's the place right near the 'Old Trader' store. Oh man! They got kites and there's these little airplanes for 69 cents."
 R: "Oh, I'll have to take a look at those kites. I would like a kite."
23. White Mountain Road/Snowdon Road junction from north on Snowdon Road.
- D: "Yeah. Uh...that road I know where it's going to. See, 'cuz that's the back way to go to the Lake Road. See, you go that way and then that's the back way to go to the Lake Road."
 R: "The Lake Road."
 D: "Yeah. And see you go up that way and then you can go to John Wright's house."
24. North Hill Road - looking up from junction with Townview Drive.
- D: "Now that's the road to go to the dump, too."
 R: "The dump, huh?"
 D: "Yeah, you can turn."
25. The library and surrounding buildings from School Lane.
- D: "Um, see, you can see part of the library right there."
 R: "Uh-huh."
 D: "See, there's the statue. And there's a church, and there's the same place over there (Marsden's, the old hotel)."
 R: "The big brown place again with the elevator?"
 D: "Yeah. You can turn now."
26. Snowdon Road half a mile from the town center.
- D: "Um...that's, I remember that. I remember that small house, and then you go down that way and right there's the River Restaurant. You can catch a lot of fish there. And you know what my father did? He went swimming down there."
27. Snowdon Road after the first bend near the town center.
- D: "Um...I know one thing. Right near that thing there's um...oh, the 'Big Time' Dance Hall. I worked there one time."
 R: "Oh."
28. Bottom of Plum Hill Road from East Main Street.
- D: "That's going up to our house and you know what? See, right near there, up there, a little ways, the Collie's live there, and if you go down here to the Bridge Diner, you go through the woods and you know what? There's the river and then you go through the woods. And you come out right near the Bridge."
 R: "Oh, a short-cut."
 D: "Yeah. You can turn."

29. Middleton Road between Brook Lane and Northville Road.

D: "Oh, now can you see where I told you about, that's where I saw the horses, and you know what? There's a bunch of rocks. When it rained and then it freezes, there's green icicles and blue and all different colors."

R: "Do you know where this is then? Or where it's near?"

D: "Now, you go up that road and there's the sugar house. You go up this road and there's the farm where there's the barn."

R: "Oh. Do you know the names of any of these places?"

D: "Well, I can't remember."

R: "Oh."

D: "You can turn."

30. Snowdon Road between the Elementary School and White Mountain Road.

D: "Um...that I know. 'Cuz that's the river, and, oh, the gas station there, where there's cars and wrecks. Okay, you can turn."

31. West Main Street near the two churches.

D: "Oh, I know where that is 'cuz if you go down here there's the ice cream stand. In the summer. It's not up there now. And that's the Catholic Church. And you go over here and that's where Lucy lives. My mother used to work there, and I think the name of it was Snow Hill Inn, but I don't know. You can turn."

32. Top of Plum Hill Road.

D: "Oh, I know where that is. 'Cuz see you go down there and there's our house."

R: "Down where?"

D: "You go down here, see (points back towards us, away from the street) and there's our house. This is a short-cut to go to Henry Morgan's house."

33. West Main Street and the junction with Brook Lane.

D: "Yeah. Now I, I think that's by. . . I don't know. But I know where that is. See there's the ice cream stand right there. And you go up, where Middleton Road goes. Yeah. That's the way to go to the Medical Center, too."

R: "Medical Center, okay."

34. Lake Road between junction with North Hill Road and the town's sanitary landfill.

D: "Um...that's, I know where that is 'cuz Daddy used to work there, he was working on a lawn mower. A riding one. I think it was Dr. Jeffrey's."

R: "What road is that, do you know?"

D: "I don't know the name of the road, but it's the road with the dump on it. If you go up there, you can see our hill and our house."

R: "Really, you can?"
D: "Yeah. You know whose dog I think that is?"
R: "No."
D: "It's Wiggles. That's Finn's dog and he had it for awhile there."
R: "Oh, you know what house that is?"

35. Bottom of Bear Hill Road from near its junction with Snowdon Road.

D: "Uh, yeah. 'Cuz that's the road that, see, I think that is Wiggles 'cuz that's Tom's house now."
R: "Do you know what road that is?"
D: "That's Bear Hill Road 'cuz you can go up that way and there's the Lake Road."
R: "Uh-huh."

36. East Main Street on the edge of the town.

D: "Right there, see that white house?"
R: "Yeah."
D: "Well, that's where I used to get some money from but she lives in Northville now."
R: "Really, from that white house?"
D: "Yeah. Anything I wanted I could get. Apples, bananas."
R: "You lucky guy."
D: "And there was cheese and I think she gave me a Canadian dollar. You can turn."
R: "Okay, do you know where that road goes to?"
D: "It goes to Northville I think, yeah."
R: "Which way to Northville?"
D: "You go that way."
R: "Straight down."
D: "There's this road you got to go off and there's a bridge. You can turn."

37. East Main Street from the bridge.

D: "I know where that is. That's where there are the traffic lights. If you go up there, then you go near the Drug Store and then there's the appliance store. That's the road to the dump and you go straight and that's where the Universal Supermarket is. And if you go right near the Appliance Store that's where the River Restaurant is."
R: "Okay. Oh, that's not on this picture though, huh? Is there anything on this picture you know?"
D: "Yeah, that's the Bridge Diner there. You see you could see some horses up in the window up there. Okay, you can turn."

38. Snowdon Road from the town center.

D: "Hey, you can see some of the River Restaurant, see? That's where my father used to work and you can see some of Smith's Store. Some of that, um, like, I don't know what it is; something like a bank. There's the church."
R: "Uh-huh."

- D: "You can turn."
R: "Okay."
39. Snow Peak Road near its junction with Plum Hill Road.
- D: "Um... I know where that is. On Snow Peak Road."
R: "Snow Peak."
40. Northville - Main Street.
- D: "Yeah. Ah-hah! That's in Northville."
R: "Yeah, how did you know that?"
D: "'Cuz, see, 'cuz I know it. 'Cuz there's that house right there and if you go over here, there's a place that there's new cars."
R: "Sells cars? What's that over there you say?"
D: "Yeah. You can turn."
41. Plum Hill Road viewed from Greenlawns Hill Road.
- D: "Hey, I think you can see my house from here. Oh, I know that place 'cuz that's where we got our maple syrup from up that road."
R: "Really."
D: "Mommy got it. And see, this is part of Plum Hill maybe."
R: "In the distance?"
D: "You could see our house. I don't know. Maybe that's some of our house, there. No. But, it's up in the trees."
R: "That's a shame. What about this road here? Do you know what that is?"
42. Greenlawns Hill Avenue from its junction with Pleasantview Lane.
- D: "Oh, this is Greenlawns Hill."
R: "You know any other places there?"
D: "No, but, you know what? My mother wants to live right near there. So you could look right down on everything. That's a pretty place."
43. The "cut-off" road from its junction with Pleasantview Lane.
- D: "I can't remember it but I know it."
44. Lake Road past the town's sanitary landfill with mountains in the distance.
- D: "Um...that's on Snow Peak Road. No, I think that's somewhere in Inavale. I don't know. You can turn."
45. Lake Road near the lake.
- D: "I don't know but oh, now I think that's the same hill that we saw. I don't know but I think that's White Mountain. And that's Big Mountain (both are on the horizon). You could turn. . . . That I don't know . . . um." (Not recognized)

46. Town Center viewed from Factory Lane.
- D: "Oh, I know that one - the church."
R: "The church, uh-huh."
D: "And that's the place that ... "
R: "The place that what?"
D: "I think that was Marsden's; that big brown place, but I don't know what it was used for. And I think that's some of 'The Trader's' store but I don't know. You can turn."
47. The town quarry viewed from the Universal Supermarket.
- D: "I think that's behind the supermarket."
R: "How on earth did you recognize that?"
D: " 'Cuz see, there's a big sand-pile and you know what?"
R: "What?"
D: "They practice there; the firemen practice."
48. Meadow Farm from Snowdon Road.
- D: "That place I don't know." (Not recognized)
49. The town's sanitary landfill from Lake Road.
- D: "I can't remember." (Not recognized)
50. Meadow Farm from the Elementary School.
- R: "Do you recognize what this place might be?"
D: "I don't know."
R: "That's Meadow Farm, don't you think?"
D: "Oh yeah, 'cuz I see the barn."
R: "Yeah."
D: "And, oh, I don't know."
R: "And this is the school playing field here. Taken from right out of the school." (Not recognized)
51. Indian Lake from Indian Lake Road.
- D: "That's on the lake road."
R: "Which lake?"
D: "On our lake road. I think. Yeah, 'cuz that's some of the lake. I think. Right there."
R: "Which lake is this? Do you know?"
D: "Our lake."
R: "Your lake?"
D: "Yeah."
R: "Yeah."
52. The town's treatment plant from East Main Street across the river.
- D: "I know where that is, that's the Smith's house and you know what? That's on the Lake Road."

- R: "On the Lake road."
D: "And then you go down this way and there you are at the lake. You go down that little road. Have you ever been there?"
R: "I've never been down there, no. Do you know where this picture is taken from? That's kind of hard to say isn't it?"
D: "Across the river?"
R: "Yeah."
53. Factory Lane from East Main Street.
- D: "Yeah, I know where that is, 'cuz that's near the factory, over here I think. Yeah. And then you can walk down to the river. And off over here there's a dam. It flooded over one time. You can turn."
54. Lake Inavale from the end of Lake Road.
- D: "Oh, that's a picnic place, um. . . I've been there I think. Yeah. 'Cuz I think I've been on that rock. I don't know."
55. Baseball field from School Lane.
- D: "Oh, that's down...that's near the High School. 'Cuz that's where they play baseball. I want to be a baseball player when I grow up. Today we got Little League."
56. The commercial strip on East Main Street.
- D: "Hey, you can see. See, that's where the thing is. . . um, the 'Old Trader' store. You see, like that place right here, where there's pretzels and they got these Christmas trees lighted up. And you know what? If you go down a little, see that place and then you go over in there somewhere, there's where you can get some doughnuts. Turn."
57. The Town Common at the top of Pleasantview Lane.
- D: "That I think I know. Yeah! 'Cuz that's the place that we were workin' at cuttin' down those things."
R: "Really? What hill is that, do you know?"
D: "Greenlawns Hill. 'Cuz you can see (on Plum Hill) if you're standin' on it. And yeah, you know what? We saw behind Smith's when we were working up there? And the fox! Right behind Smith's."
R: "Boy!"
58. The town cemetery from School Lane.
- D: "That's right near the bridge. Fire house, I think it is."
R: "Do you know what that place is called?"
D: "That's the town, oh, cemetery. That's where people get, um...oh, buried."

59. The town's reservoir and private airport viewed from Plum Hill Road.
- D: "Hey, this is on my hill. See, 'cuz this is part of Smith's. Then there's see, that's Richard's airport. You see, he comes down here and he turns around and takes off."
60. West Main Street near the Universal Supermarket.
- D: "Oh, that's looking, um ... from Greenlawns Hill?"
R: "What can you see, see if you look real close up?"
D: "You see if you go over here see, you can see that and that's our hill (in the distance). Okay, turn."
62. The factory, viewed from East Main Street.
- D: "Hey, that's the factory. You see we could see that, where we are. See, 'cuz this is where Alice lives."
63. West Main Street area viewed from Townview Drive.
- D: "I don't know, but I think I know. I know 'cuz see you can see the town. See, that's the High School and there's the town garage. There you see, there's the telephone company. And there's one of our cars there I think it is. Yeah. That's looking off of Greenlawns Hill again. 'Cuz you can look right down on everything. You can turn."
R: "Do you recognize any of the places on that?"
D: "Yeah. The town garage again and the High School. I recognize that 'cuz that's near that, well, it's right near the building near the statue. Okay."
64. Town center area viewed from Townview Drive.
- D: "Um...that's taken from the same hil 'cuz you can see all the town trucks and the town garage."
65. Big Mountain Lodge and resort development.
- D: "Oh, that's some of Big Mountain. You know why I can recognize it?"
R: "No."
D: "'Cuz see, there's a duck on the lake."
R: "Oh, yeah. That's the last one I'm afraid. Time for lunch anyway. We finished just about in time I think."
D: "Yeah, that was good."

APPENDIX F

SOME INSIGHTS FROM MY OWN CHILDHOOD GEOGRAPHY

The remembered past is not simply a past of perception. Since one is remembering, the past is already being designated in a reverie (dream) as an image value. From their very origin, the imagination colors the paintings it will want to see again (Bachelard, 1969 p. 105).

It is a beautiful sunny spring day and I see a green open meadow bounded by clumps of deciduous trees. A young boy and somewhat older girl are running excitedly out of the woods towards a white mansion of a house, clutching bunches of yellow primroses. They run across my mind--always from left to right--passing down stone hallways to the room in which my mother is resting. Dancing with excitement, they present the flowers to her. This is my earliest image--it is the day of my birth; the children are my brother and sister bringing spring's first primroses for my mother! I have numerous other images of the environment of my infancy. None, however, reveals more dramatically than this how many of my images of the past have been reconstructed from the accounts of others. It was gleaned entirely from tea-time discussions with my family. So many of our memories are constructed in this way. Memory, in fact, is always colored by one's imagination, one's dreams and the recountings of others (Bachelard, 1969, pp. 96-141). The image of the primrose scene is actually--my sister tells me--totally inaccurate as far as environmental specifics are concerned, yet captures the spirit of the occasion. Through memory, one creates the landscapes of a past and so reveals the web of feelings involved in childhood experiences of place more richly than in any other way.

Exploring my mind for memories of places, I find that following a series of rapid yet amorphous associations, singularly powerful images fill my brain. They arise in no discernible chronological sequence and there seems to be no systematic mental strategy by which I can move onward from one image to others of the same period. Instead, no sooner have I begun to search for an immediately subsequent image or a particular scene than another place looms out of the past, replacing the world of present objects and sounds with its own contours. The images are not of independent objects, but of landscapes through which I can mentally travel. It is rarely possible to date them accurately. Although I may have experienced a place hundreds of times, it always appears as a single composite image, incorporating events I have myself witnessed, together with those described by others, dreams, and fantasies. Although these images are commonly built from dozens of separate experiences, they are usually recalled in conjunction with one particular event. The laws which govern this process appear far beyond my grasp. I recall some scenes from apparently insignificant vantage points such as my earliest memory of shops, remembered from a spot where my mother told me to pull up my long grey socks which were constantly falling down my legs. But, as is commonly noted, others of apparently striking significance are a complete blank to me.

to insert myself into the life of the family that I had not consciously shared during these earliest years of my life and from which I felt excluded.

I wonder how whether in recalling these events my family actually concentrated on setting the physical stage, leaving aside descriptions of personalities and social relationships, or did I myself find it more to my liking to focus on physical details rather than the complicated abstract relations of the people involved. I know, for example, that the third step of the stairs inside our "mansion" was a superb place for emptying tea leaves from the teapot, but I have no memory of the reactions that this strange behavior provoked. Never are these scenes remembered bereft of props like a Shakespearean stage set.

The move to Long Eaton in the industrial Midlands meant a complete turnabout of staging. It was a shock for Geoff and Audrey, at eight and eleven, to find themselves in a land of concrete, dense houses and strange accents. I was too young to reflect upon these changes and their meaning for myself (1). Today I can remember nothing of my first home in the industrial landscape although, in my later childhood, in Toton, upon occasionally hearing trains at night, I would recognize a certain familiarity of sound. This I was told dated back to my time in the Long Eaton house which stood next to the railway sidings, the source of these domino-like sounds of dozens of shunting train trucks.

It was at Beeston that I started my own store of visual images. What I recall are my four and five year old impressions of events, but events existing as islands rather than sequenced. It is difficult for me to know exactly when I gave the order that I have to my memories of those years. I assume that I worked it up gradually through repeated exposure to the place, subsequent reflection with accumulated information, and the other processes of mental reconstruction that provide a sense of order. There exist, however, certain events which I recall as of an image in a crystal ball. These can sometimes be dated accurately in that they comprise certain externally validated occasions. My first day at school is the earliest of this type. I see a large green gate and a coarse orange coconut-hair mat. These objects are there without spatial relatedness to each other or to anything else in my memory. Numerous other images that I had held in a similarly disjunctive fashion I was later able to place when I returned to the area and became involved in locating and relating my floating objects.

My routine movements at that age were strictly limited to the area of the house and its gardens. The front gate of our small terrace home, which opened onto the main highway, was not to be passed alone under any circumstances. Both my girlfriend's house, a few houses down the road, and the golf course, which lay in the opposite direction, could be seen from the gate and so I had no cause to map-image them. To the left and right lived friendly neighbors who could be visited only by invitation. I keep only a general impression of their faces and the fact that one had a small greenhouse. The trees and bushes lining the rear of the backyard formed a thick impenetrable

1 See Schactel (1959) for a lengthy discussion of "Childhood Amnesia", i.e., the difficulty of remembering one's early childhood.

wall beyond which I know nothing except for the voices I often overheard. Also, there was a dirt bank which, for some reason I no longer understand, was always the chosen spot for my play with the two girls from next door.

I remember the interior of my home in the same discrete and partial manner. Of my room, all that remains for me are images of nighttime. Lights move on the curtain as traffic continuously passes along the busy highway beyond our gate. I was often frightened by the patterns thrown onto the printed wallpaper by my bed and I can remember a terrible nightmare I had of two dogs fighting. Rover, my closest companion, was always getting into fights with other dogs after he was moved from his free-ranging days in Sussex and it is very likely, my sister tells me, that my dreams and memories are related.

My memory of the journey to school has, on the contrary, a distinct order. I see a series of looming features and abrupt images as I turn corners along the half-mile route. My five-year old friend, Virginia, and I walked along this by ourselves. I can remember the sense of confidence I felt travelling along a well-known stretch, seeing a corner up ahead without being sure exactly what lay beyond, then discovering with surprise and satisfaction that I had come to another scene through which I knew I could competently navigate. This was my earliest experience of ordering information into a form resembling the phenomenon of mapping.

The sense of journey was not limited to the walk to and from school. I can see myself walking across the kindergarten yard towards the awesomely large green gate leading to my brother's schoolyard. I had been sent with a message to the world of the "big kids" and while I found my own school environment strange and confusing, going across my own yard, through the huge gate, then across a much larger yard meant I would have to leave familiar ground. It was only the greater fear of disobeying my teacher--a large old lady with white hair, a pink face, shiny glasses, and a long smock--that kept me going. She is the only memory I have of a person in the midst of a set of disconnected places: my classroom with high windows pouring sunlight into a gray atmosphere thick with smells of the dryness of chalk mixed with the heaviness of clumpy gray clay kept in large dustbins; newspaper-topped desks covered with jam jars full of brightly colored powder paints; and, in the corridor, the magical tropical fish aquarium that drew me to stop at every opportunity.

I do have memories of the move to Toton. The place still preoccupies me as a mental museum and as one I return to in my mind when I need to calm myself in the midst of confusion. I loved growing up there although the first few days, as I hid behind the curtains staring at the children outside in the street, I was not sure. My determination was stronger than my fright, however, and gradually I was accepted into the tight gang of children from the twenty houses of Old Mill Close. I remember a lovely girl, daughter of the family who swapped houses with us, dropping sticky brown aniseed candies from her wet hand into mine on the day of the move and my excitement at the thought of being able to play in the center of our largely traffic-free street. Here cricket, soccer, tennis, hide-and-seek, and various forms of dramatic play could be carried out undisturbed. If a ball went over a fence, it could easily be retrieved except from the one closed-off garden behind a high hedge and a locked gate. We spent a lot of time in the extremely

large area of empty fields just 400 yards away and in hunting, tracking, and chasing games in the neighboring streets. All this freedom was different from the strict boundaries of Beeston. I knew few parental restrictions as the area was relatively safe from traffic, crime, or dangerous physical features.

My mum asked only that I avoid following certain children whom she did not trust and this was true for the others in our gang as well. Almost all of the children seven years or older were free to play in the fields so long as they let their parents know first. At mealtimes we could rely on our collective stomachs or upon the calls of one particularly vocal mother of a large family. Given this lack of parental restrictiveness, something else must be called in to account for the definite sense of boundaries I established and seldom ventured beyond; my own fears of the unknown worked against my urges to explore and curtailed the expansion of my environment.

I recall one very special moment in the spatial expansion of my known world or, perhaps I should say, in my awareness of a spatial world. It must have been around the age of eight years. I was playing a game of "tracking" with the "Old Mill Close gang" of children. This involved a two-team chasing game whereby one team runs well ahead of the other and leaves markers and symbols made of twigs or stones, and chalked arrows, etc. The second team is supposed to use these markers as guides in their pursuit. This game took my friends and me a little out of my usual range of free play, down Carfield Avenue (see Map Figure F-1). At the end of Carfield Avenue I came across a busy main street which I knew I could not cross. I knew I was out of my territory yet things seemed familiar. With fascination I looked down the road and to my amazement I saw the village library. Suddenly I realized I had mentally conquered a large area of space for I knew how to reach this library by a completely different route. I had visited the library a number of times but always by walking with one of my family along Stapleford Lane. Now I realized that these two roads formed part of a giant circle. The discovery was wildly exciting to me for it meant that I now had a mental hold upon, and confidence to travel within, a large new area: I had "discovered" space it seems.

For the years following my move to Toton, Map Figure F-1 shows my area of the village as I knew it before my entrance into a secondary school, located some distance away, when I was 11 years old. Through the description of my childhood activities--and the physical/social context in which they occurred, I will work back and forth between the environment I knew and the images I have formed in order to set into perspective the role that "place" played in my childhood.

We used the street and pavements for a set of more or less fixed activities--cycling, skipping, roller-skating, soccer, and for just sitting on the curb and talking. Combining with the private hedges, entryways, and vehicles, the street area became the place for hide-and-seek. Its location right outside our homes encouraged its frequent use, even for a few minutes, as we could always "call for" a friend if no one was around. I knew well the location of each stretch of concrete sidewalk in the surrounding streets as well as their relative merits as smooth surfaces; the horrible corrugated

surface of the road made roller-skating on it something akin to pneumatic drill work. Adults occasionally used the street while working on their cars or cutting the hedges that lined the sidewalk, but it was really ours. Except for back garden over-the-fence exchanges between neighbors, all communication of our parents occurred through, and commonly concerned, us.

Though we used it as we did, the street was definitely secondary to the fields as a chosen playspace. They had come to be called "Jeff's"--none of us knew why--and served as an ideal playground: acres of relatively flat grass cut by the local authority frequently enough for us to play football and cricket at anytime; trees and bushes of all sizes for climbing and hiding; a marshy creek and two faster flowing streams with a host of small fish and insects; a small play area with swings and slides; plus the ruins of what appeared to have been a gigantic house. Whenever three or four of us came together, regardless of whether we had plans or not and as long as we had more than a few minutes before mealtime, we would head for "Jeff's". Usually, especially when I was young, i.e., nine years old or less, we would not have any particular activity in mind and so would head for one of our two favorite areas: the line of old willows along the swampy creek or the row of hawthorn bushes along the top of a low (ten foot high) ridge. Here we created, changed, and recreated a multitude of different environments. It was clearly our territory to do with as we pleased. I knew it belonged to the Council and I somehow knew that this meant it was for us to use. We knew that it was the Council who built the playground (some time after my arrival in Toton) and none of us ever questioned the notion that the surrounding fields of long grass, bushes, and trees "belonged" to us. As far as the adults were concerned, it was outside of their own sphere except for an occasional dog-walker.

In recent years, the Council has attempted to "improve" the fields by making them into a "park". This has led them to turn more than half of it into a recreational area by flattening it; draining it; removing all trees, bushes and loose parts from it; seeding it with carpet-like grass and regularly mowing it. Fortunately some land still awaits "improvement". More and more small common lands are being systematically destroyed by planning departments in England through the expansion of housing estates and their lack of awareness of the actual nature of children's interests and activities. The wonderful versatility of fields such as "Jeff's" is being replaced by the dull uniformity of "recreational environments": flat fields for athletics and organized games; small flat grassy play areas adjacent to children's homes which are useless for almost anything but running; and the conventional steel and concrete playgrounds which are largely unoccupied except by mothers with their toddlers. No doubt this trend will continue unabated until suburban areas become so sterile that the "adventure playground" idea used presently in cities for providing "loose parts" play environments for children will be seen as necessary. It is most unfortunate that planners are unable to recognize that English children can find suitable environments for themselves if they would only stop breaking the landscape down into a completely segmented patchwork of specifically prescribed places (see Hart, 1976).

The marshy creek was our favorite spot as youngsters. We were told that there had been a stream there and an old windmill that stood in the ashen area that was built over as a playground. We assumed that the name "Old Mill Close" came from this and the linkage of our street with the willow

creek made it seem even more like "our" place. While other children might have used the area as well, we played there as a tight group and felt a sense of first priority. The willows were so old and gnarled that they could easily be climbed inside of, and on top of, even by the youngest children. Although they had been burnt many times, the trunks and main branches seemed as solid as stone. The flexible branches, which somehow survived the roughest treatment, made these trees ideal for setting up temporary camps and houses as the setting for all sorts of dramatic play. Later on, in these same places, I learned to smoke with birchwood straws and to kiss and be kissed. The most important quality of these areas was that they were "ours"; this setting, more than any other of my childhood, provided opportunities for us to explore and experiment in ways that cannot occur under the constant surveillance of adults: how to assess and risk danger (essential to this free play was the fact that even though we were not guarded over, we never had to restrict our movements or activities because of potentially serious dangers); how to construct sites and structures; how to invent and reinvent rules for the conduct and maintenance of our group activities; and how to stop or prevent fights. All of these ventures were clearly removed from our homes, yet, in fact, we were only a two or three minute run away. It is the imaginativeness and process of learning by trial-and-error, through ingenuity, and in the testing out of our own constructions that is being leveled out along with the fields. This was "our" land and it was ours because of what we could do and did do with it. Being restricted to using inflexible structures designed for us rather than by us would have reduced our play to mere amusement and not allowed it to offer the learning opportunities we enjoyed.

There were two rivers on this property: the Big Erewash and the Little Erewash. Only the first was within my range before the age of ten. Unfortunately, for most of the year, it flowed too swiftly for there to be tadpoles and other tiddlers for us to catch. For this I had to wait for those rare occasions when a visiting aunt or uncle would accompany me to the Little Erewash. The Big Erewash, however, was superb for sailing small sticks and all sorts of imaginary craft built with reeds and long grass. I did not think to ask questions about where it comes from or goes to, but I was thrilled to discover while exploring one day that it split into two branches at one point, then reformed into one stream a little lower down. Later on, while on a fishing trip, I saw this stream joined the Trent. The revelation that a part of my own world led to this large river and thence to the sea intoxicated me. While I had surely been told this before, it was not until I actually followed the course of the stream myself that I believed it.

Our street was a cul-da-sac which we all called the "frying pan" because of its form. Within this area there were some mini "common lands" available for our exploration and free use. Nigel's garden was the most impressive: it was the only one on the street which didn't conform to the adult tenets of plant-embroidered geometry or billiard table lawn. Nigel's backyard was made up of grass of many different heights, heaps of soil, and old toys which made it perfect for all kinds of make-believe. The only limitation was that Nigel was a year younger--and so clearly I only visited him when none of my older pals were around. I have often wondered about the extreme closeness that we children shared--what led us to be able to form

as tight a group as we did? I think a number of factors were contributing to this high degree of group and place identity: the primary being that we lived in a cul-de-sac with a very clear separation from the surrounding streets; the second, that our little island of a street had more than enough children of similar age to form a critical mass for any kind of game.

Most of the children were within two or three years of my own age, making a gang of about 25 possible playmates. On all but the coldest and windiest of days, all one had to do was to step out into the street to find a friend. I never knew loneliness except for those first few weeks when I hid first behind the curtain, then behind the front hedge in the entry way to the house. But we were definitely an insular group; so much so that the children living just one house around each corner never joined in our street play and rarely even when we ranged out on our frequent visits to the large park. The combination of the form of our street and the accessibility of the open fields allowed us to define ourselves as a self-sufficient group.

My sense of my home and my place within it was also formed out of a strong group/social identity. I have already mentioned how I sought to make myself a part of my family's entire life, through imagining the places and the events they had shared which lay beyond the earliest of my memories. Growing up, all of my interest and attention was centered on the family rooms downstairs. The bedroom I shared with my brother was merely a place to sleep in and to keep tidy only as my parents demanded--no part of it carried any special significance to me. It was the lounge that held importance in my eyes: a warm, soft place for playing, listening to the radio, watching the fire--always on the floor where the the carpet felt and smelt so good.

The dining room was the spiritual core of the house; the one place where my busy family could always be relied upon to come together. Later, in my teens, when first my brother and then my sister left home and married, it was often difficult for me to sit through the evening meal, occasionally fighting back tears of sadness that our group had broken up. I was never able to change my seating position at the table even when there was just my parents and myself. Nothing looked the same from any other position: the room itself, my family, the view into other rooms or through to the back garden. Continuities of experience--and the ways in which this is manifested through a sense of place--figure in our lives with varying degrees of significance.

As I look back, I see myself desiring to comprehend the extent and diversity of the world, of environments to a notable degree. This was combined with what I can only call a spiritual impulse to find unity in human existence. I wanted to know all of the places there were to know and to find in each, people living harmoniously. This was probably the same impulse that so charged my feelings about the gang of "Old Mill Close", my family, and the home and neighborhood environments in which these groups created their identities.

The garden was as important to me as the family rooms. It had three distinct sections in its 60 foot length. Closest to the house a 15 foot patch of grass and dirt served for everything from acrobatics to fixing bicycles--

this in spite of mother's persistent protests that the "lawn" be preserved as such. The second 30 foot long section comprised a formal lawn and plant border. It lay at a slightly higher level, separated from the bottom patch by a rockery, one important portion of which is mine. The lawn was successfully guarded by mother from all but the mildest uses: the tortoise grazing, and sun-bathing. Beyond this was a no-man's land of brambles, rhubarb, giant toads, and a rubbish heap. This was mine to colonize as much as I desired or dared to. It was here that I experimented on my own with the skills of growing, following upon images of my father at work in our one acre nursery business. Clearing the patch and eventually producing many weedy vegetables and flowers was extremely satisfying for me; and similarly I held much pride in watching my rockery plants grow.

The only place in the house and surrounding area that I did not feel comfortable in was my bedroom at night as I waited for my brother to come to bed. My mind concocted all sorts of frightening creatures, residing beneath my bed in particular. These I could fight away only by deciding upon and carrying out a related number of rituals. That is, they could not hurt me if I had jumped into bed before the count of ten, having placed my slippers perfectly together and in line, etc., etc. Fear of going to bed was my equivalent of fear of attic and/or cellar--those archetypically scary places.

My parents' nursery was only a couple of hundred yards from my school, both being on the other side of the village from our home. I often went there after school, working and playing until tea time. There were dozens of activities on the potting bench; using the hose to play with the soil under the bench while pretending to water the asparagus ferns; hunting and running from spiders in the box shed; caring for plants that I had personally identified with; painting a door or a gate for my dad; exploring the tall weeds growing in the compost heaps at the back of the greenhouses; and dropping stones down the well. My father slowly gave and expected more and more responsibility from me. This chance to learn through trying things out on my own and under the guidance of my father in his actual work situation was invaluable. Not only was I able to discover how things are built, how mechanical systems operate, and how things grow; I was learning about work itself and the challenges, satisfactions, and frustrations it can offer. The complete alienation of most children from their parents' places of work is surely one of the most serious failings of our urban and technological society. Unfortunately, even if arrangements could be made for children to see their parents at their jobs, the benefits would be limited; so many workers are themselves alienated from their work, carrying out clearly specified tasks, the end purpose of which they have no part in and may not even be aware of. Opportunities for children to make a comfortable transition from what is called "play" to the satisfactions of meaningful work ought to be made available as a central core of public educational policy for all children. Children should also be able to observe processes in an environment: things being constructed, plants and animals growing and being cared for in a host of different ways, all of the various elements of a school heating system, etc. Only when I left school at 15 did I discover how little most of my friends had been able to learn about the practical workings of the physical world. I realized then how much I had learned about the environment (both "natural" and human-built systems) from my participation in the workings of our nursery. Perhaps the most important aspect of my father sharing his

work with me was that not once during my childhood or youth did I resent his extraordinarily long hours of work and hence limited time with me at home. I was witness to the actual process of earning a living so never subject to the idea that money just arrived in a packet.

Smells are undoubtedly the sensations which most powerfully lead me back to early memories: the smells of newly watered plants, of steamy thick vegetation heat as in the cucumber house, the dry smell of soil being sterilized and the more subtle comforting smell of soil itself learned from hours of play and work in the potting bench. Each of these throws me back into reveries of childhood: suddenly I am alone watching water flowing from my hosepipe, pooling in the pots of geraniums on the gravel bench. How different is the compelling power of recall touched off by smells from the active reconstructive nature of most of my visual memories (1). However, the power of an odor to propel me backwards through time can become frustrating, and even annoying. There are times when it is difficult to precisely locate the source and I am left sniffing in vain, knowing only that it was a long time ago and is certainly the same as what I am smelling now.

Scanning my mind quickly for the most powerful images of my days at the nursery, a number of images of particular events arise. Prominent among these was the day I explored beyond the bounds of my parents' grounds. I spent many hours exploring the exciting wastelands of rubbish, old boxes, and tall weeds with strange flowers and seed pods at the rear of the nursery. This area drew me for my games of playing with spiders, water skates, and various aquatic insects from a safe distance with long pieces of wood. The wall of bushes on the other side of the ditch was the boundary to an unknown world which I knew must be exciting because there were no houses and gardens there. The day I remember was a special one for my brother deigned to explore with me. With some daring we ventured across the ditch and through the hedge into the fields of long grass beyond. There we discovered bushes and bushes of raspberries! Barely had we begun to consume the berries when, as I recall, we were chased off by a furious old man with a stick. My brother remembers the event merely as a mild warning, but for me the guilt associated with invading property was great. I never told my parents about this scene and it still comes powerfully to mind.

The interweaving of current references with past associations intrigues me. Green was then, as now, my favorite color and I chose it for everything. I was often laughed at for this by my friends because red and blue were indisputably the colors to choose. I can see a reason for my individual choice: that color was joined for me with the hours of play on the school field which I loved. Access to this field was controlled entirely by a one-foot diameter disc which spun from red to green whenever the teachers considered the ground sufficiently dry for us to play on. Turning it brought out all the joy of entering and so green came to symbolize all that the field had to offer for me: rolling, running, chasing, lying on your back and watching the clouds, wrestling, rounders, soccer. But, most of all, it meant grass--glorious fresh-cut grass, grass to build with, grass to throw,

1 For a stimulating discussion of memory in relation to the different senses and the different feelings associated with these, see Schactel, 1959.

and grass to bury your nose in, breathing in that incomparably beautiful smell.

Weekends often meant trips away from home in the car. Although I remember having great interest in exploring and mentally constructing a map of my village environment, I recall none whatsoever in integrating the distances covered by these family car trips into any composite spatial image. I made no attempt to identify the routes on any maps nor to construct a map of my own. If asked, however, I could produce a most vivid description of dozens of landmarks along the route to the coal mining villages where most of my relatives lived. I created a multitude of imaginary associations with these places as I filled the time during these weekly trips. One of these places carries some archetypal associations which I cannot ignore no matter how hard I try: the woods on the road from Donisthorpe to Ashby-de-la-Zouch. I would anticipate the white road signpost at the start of these woods by quite a few minutes, making its final stark appearance in our headlights even more startling. For what seemed like minutes I saw nothing but dark trees; later I realized it was only a matter of seconds. I would snuggle even further down into the lovely old cracked leather back seat between the safe warmth of my brother and sister. While I had no specific fears of animals, goblins or such in association with these woods, they were, nonetheless, solidly black and devoid of anything: my fear of them was very real. I can still offer no rational explanation for this fear other than that the dark carries no familiar forms, nothing to reassure me of the permanence and security of a known environment. Even now I know occasional moments of fear on moonless nights when alone on wooded roads in Inavale.

I remember a great deal of day-dreaming about where things come from and where they go. I remember a balloon once escaping from me. It was both a painful and an exciting experience. My mind followed it across wild and unknown lands, and I do this still. But my imagining of places was most frequently and powerfully stimulated at the oceanside through finding driftwood objects. Coming upon a jaded piece of wood on the shore, clearly from some ocean-going ship, would set courses for my imagination. These were, and occasionally still are, like smooth rapid train rides, passing in and out of tunnels into exotic scenes of foreign shores.

I have a sense that my geographical urgings--the desire to comprehend the extent and diversity of environments--were greater than those of many children. In searching my memory for motivational forces to explain why it was that I had such an exploratory drive, I can find only one. I had an almost pantheistic impulse to find unity in life on earth. Too many unanswered questions in Sunday school had forced me into my own interpretations of those aspects of my Christian lessons which did make sense to me: all living things should be cared for; love one another; we are all equal; God is within us, etc. The idealistic notion came clear to me at a very early age that there was no personality called God but that life on earth was God in the making. I think it was from this that I developed such a strong desire to explore and understand the diversity of the world.

The view from my bedroom looked out across Mr. Parson's bungalow, "Jeff's" fields, and the River Trent to the line of low wooded hills forming the edge of the Trent River Valley. This was the edge of my world; I spent

much time staring at it, imagining what those hills were like, heightened by my sense of all that lay beyond. My images of this outer world floated freely with no spatial relationships established among them. The globes and atlases I saw bore no relationship to my world of experience. I never even attempted to find my home on a map. At ten years, I was old enough to visit on a Sunday school trip the hillside demarcating that horizon. It was as exciting as any of my annual seaside holidays for it offered some fulfillment for my imagination. Standing on the top of the ridge of the hill, which had for so long been my horizon, I looked out over the town of Gotham itself the subject of a British folk tale. This was a magical experience for me: here was not the end of the world, but an ever-expanding universe. Starting with the immediately at hand, I thirstily explored all of the pathways of this wooded hillside in the few remaining hours of the afternoon.

At that age, the world was still growing larger for me. I do not remember when my expanding knowledge of new places began to make the world seem smaller and smaller. I do recall that while formally studying geography in secondary school (at 11½ years of age), I formed an objectified image of the British Isles and of the world. Now, any new landscape is integrated into that, and the aspect of exploration which had involved the "discovery" of place no longer carries the same degree of exhilarating magic. Visiting new places still excites me, but it commonly feels more like an elaboration than a revelation of the world. This has changed the focus of my explorations. In place of my extraordinarily thirsty childhood searchings for more and more scenes, as different from each other as possible, came the interest to experience people in all their differences. Reflecting upon this, it seems possible that before developing any sophisticated interest in people, I needed to comprehend the physical world and the extent and diversity of all life upon earth. I have a strong suspicion that others have a similar desire.

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