

SPACE AND SOCIETY

A Study in Socio-Spatial Dialectics  
with Particular Reference  
to Korean Villages

VOLUME I

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DECLARATION

This thesis has been composed by myself  
and is my own original work.

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## ABSTRACT

It seems to be the collective dimension that we most lack in the understanding of our living environment. The environment that houses a community may be regarded as a transformed space organised through the cultural ideology collectively held by the people living in it. The material fabric of their life space conveys no meaning detached from the contents of the lives of the inhabitants as social individuals and a society can only be sustained through the medium of space organised in one way or another. In this respect, space and society together constitute a single socio-spatial phenomenon.

In this thesis, dialectical reasoning is adopted as a method of discourse for the investigation of the socio-spatial phenomenon. Before some surveyed Korean villages are analysed as working examples of the manifestation of this phenomenon, a set of conceptual frameworks is proposed. The backbone of these is the complementarity of structure and process. The dialectical interaction between nature and culture is introduced to account for the transformation of space in the domain of nature into living space ; and the part-whole relation provides an epistemological basis for building models for the investigation of real communities. A community is regarded as a socio-spatial field where people differentiate their living space into individual regions and reintegrate them as a whole to regulate the energy-information transactions between individuals or between groups. Measures are introduced to convert the living space of a community into analysable objects. Using these, the house compounds of the surveyed villages are turned into graphs and derived graphs representing the topological relations of the individual regions. A cultural understanding of the community is crucial not only for this conversion process but also for the interpretation of the results of the analyses.

Mathematical models are established to measure structural parameters for each house compound based upon the graphs representing it. Emphasis is given especially to those parameters which reflect the differentiation and connection of individual regions, the segregation of and integration between interior and exterior regions, and the rigidity and flexibility of space organisations. Statistical inferences from the individual values thus produced are then used to reveal the nature of the interaction between the dominating cultural ideology(the Yang-Ban) and its complementary opposite(the Sang-Min) in moulding the living space of the villages.

Finally, there is a discussion of the two cultural ideologies seen as complementary poles of the socio-spatial field. It is argued that it is the interaction of these that results in the diverse manifestations of the socio-spatial dialectic which may be observed in different communities.

## CONTENTS

### VOLUME I

ACKNOWLEDGEMENTS	1
ABSTRACT	3
TABLE OF CONTENTS	5
LIST OF FIGURES	11
LIST OF TABLES	14
LIST OF SYMBOLS	15
CHAPTER 1. INTRODUCTION : THE SOCIO-SPATIAL PHENOMENON	17
1.1. THE SOCIO-SPATIAL PHENOMENON	18
1.1.1. Two Traditions	18
1.1.2. Collective Representation	20
1.1.3. The Socio-Spatial Phenomenon	23
1.2. PROBLEMS OF LANGUAGE : POSITIVISM AND PHENOMENOLOGY	24
1.2.1. The Lack of Conceptual Framework	24
1.2.2. Positivism and Phenomenology in the Socio-Spatial Study	28
1.3. THESIS STRUCTURE	34
CHAPTER 2. THE SOCIO-SPATIAL DIALECTIC	42
2.0. INTRODUCTION	42
2.1. SOCIO-SPATIAL STRUCTURE	43
2.1.1. The Concept of Structure	43
2.1.2. The Structuralist Approach in Linguistics	45
2.1.3. The Structuralist Approach in Anthropology	47

2.1.4.	The concept of Structure of Lévi-Strauss and Chomsky	49
2.1.5.	Socio-Spatial Structure	51
2.2.	SOCIO-SPATIAL PROCESS	56
2.2.1.	The Notion of Change in Structure	56
2.2.2.	The Meaning of Process	58
2.2.3.	Dialectical Process	61
2.2.4.	Yin-Yang Dialectic	63
2.2.5.	Socio-Spatial Process	68
2.3.	CONCLUSION	70
CHAPTER 3.	NATURE AND CULTURE IN THE SOCIO-SPATIAL DIALECTIC	72
3.0.	INTRODUCTION	72
3.1.	NATURE AND CULTURE	73
3.1.1.	Lévi-Strauss' Binary Distinctions	73
3.1.2.	Nature and Culture in Lao Tzu, Rousseau, and the Materialists' Views	77
3.1.3.	Nature and Culture in the Socio-Spatial Dialectic	82
3.2.	THE PRINCIPLE OF LEAST EFFORT IN NATURE AND CULTURE	86
3.3.	THE SOCIO-SPATIAL ENTITY	94
3.4.	CONCLUSION	99
CHAPTER 4.	THE SOCIO-SPATIAL FIELD OF COMMUNICATION	101
4.0.	INTRODUCTION	101
4.1.	THE SOCIO-SPATIAL FIELD OF COMMUNICATION	102
4.2.	THE DIFFERENTIATION OF SPACE	109
4.2.1.	Universals of Spatial Differentiation	110
4.2.2.	Individual Regions of Space	118



4.3. THE LOGIC OF PARTS AND WHOLES	129
4.3.1. Individuality and Part-Whole Relations	129
4.3.2. Part-Whole Relation as an Epistemological Schema	131
4.3.3. The Logic of Parts and Wholes	142
4.4. CONCLUSION	147
 CHAPTER 5. TWO POLES OF THE SOCIO-SPATIAL FIELD OF COMMUNICATION	 149
5.0. INTRODUCTION	149
5.1. A GENERAL DESCRIPTION OF KOREAN TRADITIONAL VILLAGES	150
5.2. TWO POLES OF SOCIAL COHESION	156
5.2.1. Two Social Spaces	156
5.2.2. Social Cohesion	161
5.3. THE CULTURAL IDEOLOGIES OF KOREAN TRADITIONAL VILLAGES	166
5.3.1. Shamanism	166
5.3.2. Confucianism	169
5.3.3. Feng-sui	172
5.4. CONCLUSION	176
 CHAPTER 6. THE NETWORK OF TOPOLOGICAL RELATIONS	 179
6.0. INTRODUCTION	179
6.1. FOUR VILLAGES	180
6.2. THE NETWORK OF TOPOLOGICAL RELATIONS	193
6.3. ENERGY-INFORMATION AS THE SUBSTANCE OF THE SOCIO-SPATIAL DIALECTIC	199
6.4. CONCLUSION	208

CHAPTER 7. THE GRAPH-THEORETIC REPRESENTATION OF THE SOCIO-SPATIAL FIELD OF COMMUNICATION	209
7.0. INTRODUCTION	209
7.1. THE NETWORK OF INDIVIDUAL REGIONS	209
7.2. THE INDIVIDUAL REGION GRAPH	214
7.3. CONCLUSION	232
CHAPTER 8. THE TOPOLOGICAL STRUCTURE OF THE SOCIO-SPATIAL FIELD OF COMMUNICATION	234
8.0. INTRODUCTION	234
8.1. DIFFERENTIATION AND CONNECTION	235
8.1.1. The Intensity of Differentiation	236
8.1.2. The Degree of Connection	247
8.2. SEGREGATION AND INTEGRATION	253
8.2.1. The Degree of Segregation	255
8.2.2. The Degree of Integration	264
8.3. THE MERIDIAN STRUCTURES	268
8.3.1. The Rigidity/Flexibility Index	270
8.3.2. The Organicity Index	276
8.4. COLLECTIVE PROPERTIES OF THE STRUCTURAL PARAMETERS	286
8.4.1. Spreads of the Structural Parameters	291
8.4.2. Correlations of the Structural parameters	310
8.5. CONCLUSION	317

CHAPTER 9. CONCLUSION	322
APPENDIX M. MATHEMATICAL NOTES	326
NOTES AND REFERENCES	331

VOLUME II

APPENDICES

APPENDIX I. Plans of House Compounds

APPENDIX II. Individual Region Maps

APPENDIX III. Individual Region Graphs

APPENDIX IV. Interior-Exterior Structure Graphs

APPENDIX V. Tree Structure Graphs

APPENDIX VI. Polygon Structure Graphs

APPENDIX VII. Morphism Structure Graphs

APPENDIX T. Tables of Structural Parameters

- T-1. The intensity of differentiation( $\alpha$ ) and the degree of connection( $\beta$ )
- T-2. The degree of segregation( $\delta$ ) and the degree of integration( $\sigma$ )
- T-3. The rigidity/flexibility index( $r$ ) and the organicity index( $\lambda$ )

## LIST OF FIGURES

### Figures

4-1.	Plan of Mongolian Yurt.	126
6-1.	The location map of Euin and Seommaeul.	182
6-2.	The site map of Euin and Seommaeul.	183
6-3.	The location map of Yangdong and Sopyung.	185
6-4.	The site map of Yangdong.	186
6-5.	The contour map of Yangdong.	187
6-6.	The site map of Sopyung.	188
6-7.	The process of experimentation.	201
6-8.	Intermediary spaces and interior spaces in which shoes are worn.	203
7-1.	House compound plan.	211
7-2.	Individual region map.	211
7-3.	Individual region graph.	211
7-4.	Three distinctive regions of space within a house compound.	216
7-5.	Built-in storage spaces(closets).	216
7-6-1.	Differentiation of Ma-ru space(I).	218
7-6-2.	Differentiation of Ma-ru space(II).	218
7-6-3.	Differentiation of Ma-ru space(III).	219
7-7.	Differentiation of the semi-outdoor space.	221
7-8.	The differentiation of space by the dualistic division of right/left and front/back.	223
7-9.	Differentiation of a space having out-of proportion dimensions.	223
7-10.	Varied types of openings.	225
7-11.	Sections of openings.	225

7-12.	The examples in which the origin of the link is from the inside of the house compound.	227
7-13.	The example which has no permanent walls.	228
7-14.	Walls which have remained damaged and walls with gaps.	230
8-1.	The measure of the intensity of differentiation( $\alpha$ ).	237-8
8-2.	Two directions of solution for the increased degree of differentiation.	241
8-3.	The differentiation of space under the minimum-energy principle.	243
8-4.	The plan and individual region map of Y1.	245
8-5.	The plan and individual region map of Y43.	246
8-6.	The range of values for the degree of connection( $\beta$ ) and the valency( $2E/V$ ) for space organisations with four individual regions.	249
8-7.	The range of values for the degree of connection( $\beta$ ) and the valency( $2E/V$ ) for space organisations with five individual regions.	250
8-8.	The individual region graphs of Y1 and Y43.	252
8-9.	The degree of segregation between interior and exterior regions( $\zeta$ ).	257-8
8-10.	Segregation and integration between interior and exterior regions.	260-2
8-11.	The degree of integration between interior and exterior regions( $\sigma$ ).	265
8-12.	Variations in the clustering and connection of interior regions.	267
8-13.	The tree structure graph and polygon structure graph.	271
8-14.	Tree structure graphs( $G_T$ ) and polygon structure graphs( $G_P$ ) of five house compounds.	273-4
8-15.	Component subgraphs and bridges.	278
8-16.	The process of the reduction of network to morphism structure graph.	279

8-17.	Variations of morphism structure graphs of a space organisation with 16 individual regions.	281
8-18.	The morphism structure graphs of five house compounds.	284
8-19.	A house compound whose morphism structure graph is a single vertex.	287
8-20.	An example of house compound with an organic network and its value of the organicity index under 0.25.	288
8-21,		
(a).	Box-and-whisker plot of values of the intensity of differentiation( $\alpha$ ).	295
(b).	Box-and-whisker plot of values of the degree of connection( $\beta$ ).	296
(c).	Box-and-whisker plot of values of the degree of segregation( $\zeta$ ).	297
(d).	Box-and-whisker plot of values of the degree of integration( $\sigma$ ).	298
(e).	Box-and-whisker plot of values of the rigidity/flexibility index( $r$ ).	299
(f).	Box-and-whisker plot of values of the organicity index( $\lambda$ ).	300
M-1.	$J_I$ and $J_E$ subgraphs.	328

## LIST OF TABLES

### Tables

8-1.	The intensity of differentiation( $\alpha$ ) of Y1 and Y43.	244
8-2.	The degree of connection( $\beta$ ) of Y1 and Y43.	251
8-3.	The degree of segregation( $\zeta$ ) of five house compounds.	263
8-4.	The degree of integration( $\sigma$ ) of five house compounds.	268
8-5.	The rigidity/flexibility index( $r$ ) of five house compounds.	275
8-6.	The organicity index( $\lambda$ ) of five house compounds.	283
8-7.	The H and F collections of house compounds.	290
8-8.	Summary statistics of the structural parameters.	292-4
8-9.	The means of the building coverage(B/S) and the density of individual regions(V/S) for each village.	301
8-10.	Correlation coefficients and related statistics for pairs of parameters.	311-2



LIST OF SYMBOLS

EU	Euin village
En	The house compound No. n of Euin village
SE	Seommaeul village
SEn	The house compound No. n of Seommaeul village
Y	Yangdong village
Yn	The house compound No. n of Yangdong village
SO	Sopyung village
SO <sub>n</sub>	The house compound No. n of Sopyung village
H	A hypothetical collection of house compounds of the Yang-Ban
F	A hypothetical collection of house compounds of the Sang-Min
$\alpha$	The intensity of differentiation
$\beta$	The degree of connection
$\delta$	The degree of segregation (between interior and exterior regions)
$\sigma$	The degree of integration (between interior and exterior regions)
$\rho$	The rigidity/flexibility index
$\lambda$	The organicity index
V	Number of individual regions
E	Number of connections between individual regions
S	Site area of a house compound (m <sup>2</sup> )
B	Building area of a house compound (m <sup>2</sup> )
B/S	Building coverage ratio
V/S	The density of individual regions of a house compound (m <sup>-2</sup> )
C <sub>i</sub>	Number of clusters of interior regions
C <sub>e</sub>	Number of clusters of exterior regions
E <sub>A</sub>	Number of connections <sup>between</sup> interior and exterior clusters

- $E_T$  Number of edges of the tree structure graph  
 $E_P$  Number of edges of the polygon structure graph  
 $V_M$  Number of vertices of the morphism structure graph (Number of individual regions in the organic network)  
 $H_M$  Number of components of the morphism structure graph (Number of separate organic networks of a house compound)  
 $G_R$  Individual region graph  
 $G_P$  Polygon structure graph  
 $G_T$  Tree structure graph  
 $G_S$  Interior-Exterior structure graph  
 $G_M$  Morphism structure graph  
 $V_M$  The set of vertices of the morphism structure graph  
 $V_T$  The set of vertices of the tree structure graph  
 $V_P$  The set of vertices of the polygon structure graph

## CHAPTER 1. INTRODUCTION : THE SOCIO-SPATIAL PHENOMENON

Later in this introductory chapter(section 1.3.) an outline is given of the structure of the thesis. There it will be seen that our ideas are eventually applied to the analysis of field data on Korean villages which we obtained some years ago. However, since the context of the thesis is as much philosophical and methodological as empirical, the first two sections of this introduction are given over to a summary of the point of view which has been adopted of socio-spatial phenomena and which are the basis of ideas developed in the main chapters of this thesis.

Generally, we hold the belief that facts, phenomena, or realities are less likely to be grasped through classificatory categories such as patterns, types or even structures than in a process of interactions between opposite but complementary entities. This is not out of a belief in holism but rather because there cannot be analysis without synthesis and vice versa. There exists a whole because there are parts within it ; and any individual entity cannot remain segregated without becoming a part of a whole at another level. It is along this line of thought that we will identify the socio-spatial phenomenon as a single entity consisting of two complementary domains : spatial organisation and social process.

One of the main hindrances to an understanding of the socio-spatial phenomenon has been the treatment of the interventions of cultural ideologies in man/environment interactions through a division into those of high culture(of the 'reflective few') and those of low culture(of the 'unreflective mass'). These should rather be seen as two complementary facets of culture which operate in every society. Another problem has been the inadequate appreciation of the role of collective representations in the perception and shaping of the built environment.

Furthermore, theories of space and society have inclined too much either towards positivism, by neglecting the role of human intentions, or towards phenomenology, by ignoring the autonomous domain of space organisation which lies beyond human intervention.

All of these problems, we believe, stem from the lack of a proper framework within which to conceptualise the reality which we refer to as the socio-spatial phenomenon. The present work is concerned with this problem and its implications as well as with applications of its solution. Later we present an empirical study of Korean villages, based upon materials obtained from surveys which we carried out some years ago.

## 1.1. THE SOCIO-SPATIAL PHENOMENON

### 1.1.1. Two Traditions

Although architecture is a very complex field of products and activities, discourses in architecture have tended to concentrate upon historical or aesthetic matters. This trend is well illustrated by the eminent contemporary theoretician Manfredo Tafuri when he claims that architectural criticism and research must have recourse to 'historical reason'.<sup>(1)</sup> Historians of architecture have displayed a predominant interest in the products of power. Many practitioners also seem to be dominated — whether consciously or not — by a concern to create visual splendour or at least to make a noticeable visual statement which will take its individual place in the history of architecture. Even under the disguise of rationalism, architecture has often managed to appear as art at the expense of people's other needs. If the Modern Movement was launched with a deep understanding of 'the poverty of historicism',<sup>(2)</sup> its protagonists were without blame ; but unfortunately the movement nullified its cause by retreating into monumental utopianism or falling back on machine-theoretic formalism.

Every society nurtures its own distinct culture. Even within a society, different groups or strata have distinct cultures formed in their own social conditions. The most common distinction is between the 'great tradition' and the 'little tradition'.<sup>(3)</sup> This pairing of cultures may also be represented by such terms as 'high and low', 'classical and folk' or 'learned and popular'. The former term in each case refers to the culture of the 'reflective few' and the latter to that of 'unreflective many'. Both traditions are, of course, completely interdependent in any given society — yet architectural history and criticism has treated them as being separate. Theory and history in architecture have concentrated almost exclusively on the products of high culture leaving the buildings and settlements of 'low' culture to sociologists, anthropologists or archaeologists.

This tendency has narrowed our understanding of the environment and held us in the realms of physical determinism or of dogmatic design and planning principles which tend to disguise rather than to meet the true needs of people in society.

Amos Rapoport has pointed out that the vernacular matrix — so commonly neglected — must be applied even when interpreting high style buildings and spaces. He argues that 'the folk tradition is much more closely related to the majority and life as it is lived than is the grand design tradition, which represents the culture of the elite'.<sup>(4)</sup> However, this line of thought applied to the products of a folk tradition still tends to treat it as though it were something sharply distinguished from high style.

A full understanding of the built environment, in all its social and cultural complexity, can only be reached through a theoretical framework in which the two cultural traditions are viewed as complementary parts of a whole.

### 1.1.2. Collective Representation

Through a careful study of people's life in the district of the North End, Boston, Jane Jacobs derived valuable insights into how architects, planners, and planning officials were blindly following orthodox guidelines of architectural design and city planning.<sup>(5)</sup> She inferred some underlying principles of the interaction between human behaviour and the built environment in the community from her observations ; namely that people want diversity and given diversity, by means of physical planning, the community life will generate its own vitality. Jacobs suggests some concrete physical considerations which should be applied in shaping community environment. On the one hand, her findings uncovered an important issue which had generally been neglected by architects and planners, but on the other, she returned after all to the physical determinism for which she blamed architects and planners.

As Herbert Gans has pointed out, Jacobs ignored the social and cultural factors which are supposed to contribute more than anything else to vitality or to dullness in the community. Gans discovered the crucial role of socio-cultural factors in community environment through his studies of the life and behaviour of the people of minority immigration groups in American cities and of the middle class life in suburban estates.<sup>(6)</sup> He argues that 'between the physical environment and empirically observable human behaviour, there exists a social system and cultural norms which define and evaluate portions of the physical environment relevant to the lives of people involved and structure the way people will use (and react to) this environment in their daily lives'.<sup>(7)</sup> According to him, therefore, the man-made environment is merely a 'potential environment' and by the mediation of the culture of the users it becomes the 'effective environment'. Much research work, even when it reveals acceptable insights into the relationships between the man-made environment and human behaviour, falls back on the assumption of the physical fallacy because of ignorance about the distinction between the 'potential environment' and the 'effective

environment', which are mediated by the socio-cultural dimension of collective life.

Edward Hall also argues that our culture has penetrated into the roots of our nervous system and determines how we perceive the world so that we cannot act or interact at all in any significant way except through the medium of culture.<sup>(8)</sup> Many species engage in social life, but human society is distinguished from others by the fact that it alone possesses culture. Murdock defines culture as systems of acquired and transmitted knowledge.<sup>(9)</sup> Man is born in an already existing society and from the beginning he is a social being. He learns in a society to be a member of it. The languages and culture which he learns and to which he accommodates are not his inventions. Man adds his adaptive modifications to what is acquired from society and transmits this transformed culture to other members of the society. Culture is predisposed in the notion that man inevitably lives a collective life as a social being. Culture as a social phenomenon is superindividual because it is shared by the members of the society and is perpetuated beyond an individual's life span, and because it exceeds the capacity of any individual to achieve it by himself.<sup>(10)</sup>

Durkheim draws the concept of collective representation from analogies which exist between the laws of sociology and those of psychology.<sup>(11)</sup> Just as individual representations are not inherent in neural elements, collective representations, which are formed by the action and reaction between individual minds in the society, do not derive directly from them and surpass them. So social facts are considered to be independent of individuals and exterior to individual minds just as mental facts are in relation to the cerebral cells.

Nor are collective representations mere collections of individual representations. The character of wholeness of the former is not derived from the latter but from their associated oneness. The man-made world, such as houses and settlements,

technology and language, religion and systems of laws, can be seen as the manifestation of collective life, in a cultural dimension, by the members of the society. The physical environment created by man can be understood also as the product of collective representations which manifest themselves through the associations of individual minds.

By 'collective representation' we do not mean the collective mode of human living or the aggregation of their private living spaces. The whole of the creation of the physical environment by man, however small or large in scale, is at root a representation of common beliefs regarding the nature of things, the world, and life, which are held by members of the society, and imposed on them by a power above(not of a super being but of a social collectivity), and transmitted from generation to generation. Individuals share basic assumptions about their physical environment not as individuals but as members of the society. These shared assumptions are their cultural ideologies.

Culture, which resides among the members of the group in society, is deeply related to the social milieu of the group and we can utilize the concept of ideology derived from Mannheim's sociology of knowledge. His basic premises are that every individual faces preformed patterns of thought and conduct while growing up in a society, and concretely existing modes of thought cannot be severed from the context of collective action by members of the group.<sup>(12)</sup> Men, as members of the society, confront the world not from abstract levels but rather act and think with or against one another in organised groups. This collective activity to change or to maintain the surrounding world forms the framework for their concepts and their system of thought. Their world views vary according to the particular context of collective activity in which they participate.



### 1.1.3. The Socio-Spatial Phenomenon

Man lives in a physical environment and in a socio-cultural environment. Individuals are connected by a complex network of social relations and it is impossible to conceive of social relations outside a common framework of space and time. Society is spatially meaningful and space is meaningful socially. All the features of the physical environment as it is in the raw state are originally nature itself. Once emerged from the state of nature to a social being, man can live no longer in the physical environment as it is in the state of nature. He modifies nature with his cultural ideologies which are formed and handed down through collective social life. Thus social man transforms the physical environment from a state of nature to that of cultural objects. Spatial organisation contains social process, for it confirms social process though perhaps not completely. Social process constitutes spatial organisation in that it unfolds itself through spatial means though again not completely. Spatial organisation and social process are not two separate things but the same phenomenon divided. We may call it the socio-spatial phenomenon.

This view of the socio-spatial phenomenon does not presuppose either that the spatial structure reflects wholly the social structure or the social process is molded exclusively by its physical milieu. On the contrary, the concept implies the non-deterministic principle in which the physical environment and the social process interact with each other, forming the socio-spatial process. The physical environment (built environment) remains as merely a potential environment until users adopt it. The physical environment becomes the effective environment by attaining meaning through the interpretation of users, which is intersubjective and varies from one social system and culture to another. There always remains a degree of latency in the physical environment in that its effective potential is also different from person to person for the same physical setting.<sup>(13)</sup> And the intersubjective effective

environment of a society changes in the course of time while the physical setting maintains its structure unchanged.

The fact that the man-made environment possesses its own autonomous domain beyond the intentions of man can be explained clearly by introducing Popper's concept of the 'third world'.<sup>(14)</sup> Popper distinguishes three worlds : first, the world of physical objects, second, the world of states of consciousness and third, the world of objective contents of thought. His thesis is that the third world is a natural product of the human mind and largely autonomous, even though we constantly act upon it and are acted upon by it ; it is autonomous in spite of the fact that there is a strong feed-back between it and us. Thus though the third world is a human product, a human creation, it creates in its turn its own domain of autonomy. Even if the man-made world has an autonomous character, it remains the creation of the human mind. As Popper points out, the third world cannot establish any relations to the first world without the mediation of the second world (human subjective consciousness), and feed-back of the third world to the second and first is crucial to the growth of knowledge. The autonomy is partial<sup>(15)</sup> : our creations and we ourselves exchange influences, and the second and the third worlds grow together.

## 1.2. PROBLEMS OF LANGUAGE : POSITIVISM AND PHENOMENOLOGY

### 1.2.1. The Lack of Conceptual Framework

The recognition of the significance of the fact that spatial organisation and social process are complementary dimensions of a single phenomenon, has come more from the researchers of sociological imagination than those of spatial consciousness. As for the study of the socio-spatial phenomenon, in which spatial organisation and social process interact continuously with each other, the great obstacle is the fact that there is no common language to conceptualise spatial organisation and social process simultaneously.<sup>(16)</sup> The two domains have been explained in

separate languages within their own self-contained conceptual frameworks. This raises the question of whether it is possible to develop a meta-language which bridges and interprets these two languages in a logically consistent manner.

The works of social scientists from anthropology(Hall, Tuan), psychology(Sommer, Canter) and sociology(Gans, Jacobs) have contributed to<sup>a</sup> better understanding of the relation between man and his physical environment.<sup>(17)</sup> Most studies on socio-spatial phenomena carried out by social scientists lack spatially structured concepts and models, even though they contribute valuable insights into often ignored socio-spatial phenomena. On the other hand, geographers and urban planners tend to regard space as a thing in itself by searching for spatial structure in a systems-theoretic vein.<sup>(18)</sup> One of the main streams in the study of socio-spatial phenomena has its origin in the analysis of vernacular settlements, which has been influenced by anthropological works during the last two decades. Launched as an antithesis to monumental historicism and to an authoritarian approach to planning and design of environment, these works show an inclination towards structural-functional methods and concentrate on socio-cultural factors in analysing the built environment.<sup>(19)</sup> Although these arguments opened a new perspective to architectural thinking, they still remain in the ethnocentric domain.<sup>(20)</sup>

The next tide was towards structural approaches with the supposition that the articulation of culture is similar to that of language.<sup>(21)</sup> This movement, with its consideration of cultures as systems of symbols and meanings, extended to analysing architecture and settlement forms.<sup>(22)</sup> In architecture, two general theories of sign systems which have separate origins and share the same aims(Peirce's semiotics and Saussurean semiology) have been adopted simultaneously as analytical tools.<sup>(23)</sup> As Gandelsonas<sup>(24)</sup> puts it, this approach has not led to positive results in architecture because it is precisely in this field that the difference between theory and ideology has not been acknowledged

and so most of these works may be considered as a mere terminological substitution that maintained and sometimes even reinforced existing ideologies.

Hillier et al. have been developing a morphic language in which space (the man-made physical environment) is defined as a preliminary social object and upon which pattern similarities between spatial and social syntaxes may be drawn.<sup>(25)</sup> Here, the differentiation and distinction of space, each of which is caused through the demarcation of a carrier space by continuous and discontinuous spatial objects, generate in a topological mode the distributed or nondistributed syntactic objects. The syntactic structure of this language carries no meaning at all but realises itself through the generation of spatial patterns. Through the syntactic analysis of settlements, the correspondence between spatial syntaxes and spatial patterns of the societies has been sought and social meanings are attributed to the components of the syntax model. It is difficult to find clear cut criteria for the correspondence of a component of the syntax model with a spatial pattern of a society and accordingly with its social structure. There is no guarantee that a predetermined logical structure, which is constructed from its own axioms and assumptions introduced at a purely abstract level, would parallel the counterparts of a society and its spatial deployment.

When Alexander, in his earlier work, strongly contrasts unselfconscious and selfconscious cultures by the ways ~~now~~ people perceive, shape, and respond to their built environment,<sup>(26)</sup> he unwittingly distinguishes the two cultural ideologies of high and low which we argue constitute the complementary facets of culture in every society. Alexander drew the model of mental picture, requirements diagram, and form diagram from Wittgenstein's atomism and afterwards developed this concept to the Pattern Language.<sup>(27)</sup> For Wittgenstein, every statement about complexes can be resolved into a statement about their atomic constituents and propositions, or pictures or models of reality, that describe the complexes completely.<sup>(28)</sup> Such pictures are facts, and as a picture agrees

with reality or fails to agree, it is correct or incorrect, true or false. Pattern Languages are atoms of environmental structure. The truth of any structure follows from the truth of its atomic Pattern Languages. The relations in which pattern languages stand to one another are internals. There is no need to set up relations between them. Their existence is an immediate result of the existence of the atomic Pattern Languages. For Alexander, people are only agents in the form-making process in the unselfconscious culture. They react only to environmental stimuli and have no value-orientated subjectivity. The form-making process goes through the circuit of a homeostatic mechanism. The process is a time-less repetition of input-output and has no goal. Alexander is trapped in mechanical determinism, whereas he argues against environmental determinism. We must wonder if people in an 'unselfconscious' culture, from whose form-making process Alexander draws his conceptual scheme, have really been quite so unselfconscious.

There are an increasing number of studies which concentrate on the purely configurational and formal characters of the built environment without becoming involved in any questions of values and socio-cultural factors. These algorithmic languages, in particular the studies carried out at Cambridge and those published in *Environment and Planning B*,<sup>(29)</sup> are committed to the exclusively autonomous domain of the 'third world' to deal with possible spatial organisation in its abstract formal aspects with the implication of possible computer application. These works pose a threat to the genuine understanding of socio-spatial phenomenon not in the negative sense that these efforts are misguided but in the positive sense that there have not been developed enough complementary works to counter-balance this extra-value language to contain it within a total understanding of the socio-spatial phenomenon.

We cannot grasp the whole picture either by inclining to one approach — positivism or phenomenism — or by going a middle way

as a compromise, but only by building a scheme of thought in which the opposites interact continuously in dialectical manner.

But, after all, we cannot but communicate our message in the framework of existing language and there is no way of developing a new language at once to convey a new concept. A new language as a container only must emerge from silence step by step following a process of refining the conceptual scheme which is to be contained in it. The core philosophical base of structuralism, mainly as used in structural anthropology and linguistics, will guide us towards a way of refining our conceptual scheme for socio-spatial study. Such conceptual frameworks maintain consistency in the analysis of their subject matter and in return the result of analysis vindicates and strengthens them, thus leading to rigorous theory or model building. Further, these are specially suggestive for socio-spatial study for they deal with the social phenomenon in terms of nature/culture oppositions and individual/collective representations.

#### 1.2.2. Positivism and Phenomenology in the Socio-Spatial Study

Theories in architecture generally tend to adopt a position between the two extreme approaches of positivism and phenomenology. Positivists take the view that our sensory experiences are the exclusive source of valid knowledge about the world,<sup>(30)</sup> and that legitimate concepts are reducible to elements of sense-experience. Logical positivists, later, went so far as to regard science not as a system of concepts but as a system of statements, which are reducible to elementary propositions. Positivists are preoccupied with objective reality, natural things, inductive logic, and the abstract formal construction of concepts derived from empirical data. By contrast, phenomenologists seek to gain valid knowledge through introspective or intuitive reasoning.<sup>(31)</sup> While positivism has no place for metaphysics, phenomenologists attempt to situate philosophy in the domain of 'rigorous science' by focusing on conscious experience to reach to the root of reality.

Phenomenology concentrates on intentions of consciousness within which objective being and subjective consciousness meet. Phenomenology reveals the transcendental meaning of our experience in reality, going back to the 'things themselves' through the adventure of consciousness towards the limit of subjectivity and beyond the foundation of the objective world.

As a matter of principle the positivistic approach to science abstracts from the given empirical data to arrive at objective knowledge. With quantitative and analytic concepts, it builds simplified models to grasp the structure of the complex nature of reality in a manageable way. But, from the point of view of phenomenology, the positivistic approach misses the qualitative totality of real phenomena which cannot be reduced to any of its properties. Phenomenology attempts to return to things of the 'life-world' which are concrete to man.<sup>(32)</sup> For the positivists, the phenomenologists' urge towards lived space and time, which tunes in with <sup>the</sup> subjective concept of 'here-now-and-me' as opposed to abstract mental constructions, looks like cloud-gathering.

As for theories of architecture in general, the phenomenological approach depends on descriptions by natural language with minimum abstract reduction. On the other hand, the positivistic method usually adopts abstract mathematical terms and applies models based on an analogy with concepts of the natural sciences. At the extreme ends of the scale, we can place the works of Norberg-Schulz for the former case and the research carried out at Martin Center, Cambridge School of Architecture for the latter.<sup>(33)</sup> Alexander's works show a shift of approach from an earlier positivistic trend to a phenomenological one in recent years.<sup>(34)</sup> It almost looks as if it is inevitable to adopt one approach or the other when we consider the subject matter which is dealt with. If we follow the line of phenomenology, we do not lose the concrete totality of phenomena in the study of the interaction between man and environment ; but we never reach the level of systematic understanding while we remain in a realm of poetic images or of

subjective penetration into phenomena. Relying exclusively on the method of positivism, we save the clearer picture of the phenomena at an abstract level through the use of simplified models but only at the price of losing the common ground with reality. The choice of the 'excluded middle' between these two extreme approaches turns out to be a paradox as we always make a sacrifice in our understanding of the interaction between man and environment in one way or the other.

What really matters in the study of socio-spatial phenomena is not the choice of an approach but, whatever the subject matter may be, to maintain two co-existing basic assumptions on the relations between man and environment. These seemingly mutually exclusive assumptions are : first, all kinds of artificial environments are fundamentally the products of the human mind and so are cultural objects ; and second, once created, these cultural objects possess, at a certain level, autonomous rules governing their organisation. We build houses, cultivate gardens, lay roads, decorate rooms, shape villages and towns. The provision of the human habitat is the result of the action of our consciousness. The projection of human intention converts a part of nature(physical object) into an inhabitable space(cultural object) which is meaningful to man. Once established, the built environment(man-made product) creates its own domain of autonomy, even if this is only partial. It is partial in that the human mind always mediates between the world of physical states and the man-made world of objective contents of thought.<sup>(35)</sup> There is always the important feed-back effect from our creations both upon ourselves and upon the world of physical objects. This view uncovers the illusion of environmental determinism which asserts that we can control human life for the good of all by physical planning.

The collective dimension of the built environment is outside individual intentions and beyond human control to a substantial degree. Human conventions of culture, which are the product of collective life and so are social, exist largely in the domain of



the unconscious for individuals and are external to them.<sup>(36)</sup>

The unconscious and invariant character of collective phenomena in society implies the level at which the rules of autonomy of man-made products operate. Despite frequent arguments of other linguistic schools, Chomsky's idea<sup>(37)</sup> of the autonomy of grammar seems to support our argument for the partial autonomy of cultural objects, in this case, the built environment. For him, grammar is autonomous and independent of meaning. The grammaticalness of a language cannot be derived from an appeal to its meaning. Chomsky resorts, for this, to the intuitive knowledge of their language by native speakers. When we assume that there are grammatical rules governing the organisation of space which is created by a society, i.e. 'space syntax',<sup>(38)</sup> these may not correspond to the explicit intentions of the society which produced it.<sup>(39)</sup> Only by recourse to the intentions of the makers of the space, can the grammaticalness of 'space syntax' be justified. We can expose the deep universals of socio-spatial phenomena, which underlie the diversity and particularity of spatial organisations in each society, through insights into how the basic assumptions of space organisation manifest in a particular culture or society.

During the past centuries, all sciences have become more abstract. As an evolutionary process, abstraction is clearly not peculiar to the natural sciences.<sup>(40)</sup> The social sciences have been increasing their level of abstraction by adopting analogies of the principles of the natural sciences or by applying mathematical concepts.<sup>(41)</sup> As the level of abstraction gets deeper, yesterday's abstract form becomes the concrete contents of the subject matter of a discipline today. As for the theory of architecture : as a science of the artificial, it seems inevitable to pursue a more systematic understanding of the interaction between man and his built environment by adopting abstract concepts from other disciplines. Once we believe in 'the parsimonious world', it is not difficult to accept that a law established for one order of facts may apply to any diversified phase and level of other phenomena in the world as a whole. Phenomenologists argue against

the positivists' preoccupation with abstract forms at the price of losing the concrete totality of reality, but it is not abstraction itself which is to be blamed but a narrow naturalistic interpretation of the criteria of science. If a certain level of abstraction is adopted in socio-spatial study, not as an end, but as a means to achieve a logically consistent understanding of the phenomena, the clear picture achieved will counter-balance the supposed lost ground of the concrete reality.

The phenomenological interpretation of socio-spatial phenomena often treats man as the passive receptor of the outer world. Furthermore, it sometimes falls back upon that psychologism which identifies socio-spatial phenomena with the projection of subjective mental processes.<sup>(42)</sup> This approach, more often than not, goes so far towards anthropocentrism as to wholly dismiss the domain of autonomy of spatial organisation.

By contrast, the positivistic approach, for example, in the works of Hillier and coworkers, relies on purely formal interpretations which give no considerations to human drives, intentions, or choices in the process of spatial organisation.<sup>(43)</sup> Within the scope of this approach, spatial objects operate according to the presumed axiomatic rules of elaboration to generate certain categories of spatial patterns. The syntactic characters of the spatial patterns are supposed to correspond to the social structure of which they are constituted. The process of space organisation in a society has an autonomous domain of elaboration many aspects of which are outside the control of human intentions. But it is also true that in the course of the formation of the artificial environment, the intervention of human intention is crucial. Even in the so-called 'primitive' societies man never acts as a mere unselfconscious agent in the process of space organisation. His cultural ideologies modify the natural course of space organisation. And, more often than not, the enterprise of individual free will further disturbs the course of events.

By the 'natural course' in the creation of the artificial environment, we mean a process in which man interacts with environment only according to immediate physical necessities. This is the space organisation process which Alexander tried to characterise as the typical one that people in 'unselfconscious' cultures have practiced.<sup>(44)</sup> But his ill-founded dichotomy between unselfconscious and selfconscious cultures limits the legitimacy of his theory. Human culture, of whatever types or at whatever level, can never be formed or maintained unselfconsciously. If the people in 'unselfconscious' cultures really reacted to physical necessities without any deliberation, intention, and creative strength, we could not distinguish their state from that of animals. When we deprive human beings of even Lévy-Bruhl's much criticised 'prelogical mentality',<sup>(45)</sup> there will remain a true animal. If man is a part of nature and so phylogenetically inherits certain attributes of an animal, these belong to people not of a particular category but of every society and culture. If as Alexander suggested, the form-making process in an 'unselfconscious' culture is isomorphic to the binary mechanism of a digital computer, modern men of 'selfconscious' cultures seem to be better prepared to adapt to that process. We would argue that the natural course of space organisation is only a facet of the whole process, which exists in every society and culture. Certain societies sustain a stagnated culture due to the lack of communication with other cultures, because the development of culture cannot totally depend on autogenesis. The lack of propagation may limit the incentive to imitation and creation. But this fact does not suggest that people in those cultures carry on their life on a purely instinctive basis.

To sum up the argument : whereas the phenomenological interpretation of socio-spatial phenomena excludes the autonomous domain of the physical dimension, the positivistic approach does not take into account the fact that the physical dimension of the built environment always includes the domain of human conscious intentions. Either purely phenomenological or positivistic

approaches cannot therefore secure a comprehensive understanding of the interaction between man and environment. A socio-spatial study based on one or the other of these approaches could hardly be justified except in a very limited sense, recognising the co-existing basic assumptions underlying socio-spatial phenomena. These hold that the artificial environment is pre-eminently the creation of human intentions and at the same time it consists a domain of autonomous rules beyond human consciousness. The artificial environment results from the interaction between the natural course of space organisation and human culture. Again, in the domain of culture, the spatial organisation process undergoes the interaction between the internal forces of individual representation and the external forces of collective representation. The collective force pulls the structure centripetally to keep it invariant while the force of individual representation pushes the internal potential towards its limit to deviate from the invariant totality. The mutual interaction between the external collective representation and the internal individual representation is the prime feature in the process of spatial organisation in society.

### 1.3. THESIS STRUCTURE

This study sets out to investigate how spatial organisation and social process are structurally dependent, forming two facets of an inseparable socio-spatial phenomenon (the manifestation of socio-spatial dialectic). The practice of classifying the diversities of socio-spatial phenomenon into morphological categories only from the consideration of these at surface level must be questioned. Many ambiguous explanations of the socially meaningful systems of socio-spatial phenomenon caused by the arbitrary acceptance of the cause-effect relationship between social process and spatial organisation must be disputed.

We hope this study adds a stepping stone towards the better understanding of the interaction between space and society. For this purpose, we do not employ any special brand of method but try

to reach the core of the subject matter through the process of sharpening our conceptual scheme which we hope will lead to a genuine interpretation in the examination of survey materials.

The surveys of four Korean villages were carried out, during 1975-76 and 1977-78. The gap of <sup>the</sup> intervening years inevitably exposes some limits in the use of the material in the sense that the conceptual scheme has developed to a stage which could not be foreseen at the beginning. This defect is to a degree counter-balanced by the fact that the core of the concept has remained intact. But, in any case, the formation of a conceptual scheme cannot be pursued to fit the examination of some particular examples. It must be oriented towards uncovering the general principle underlying the subject matter at an abstract level without abandoning its link to intuitive understanding at a concrete level.

We have already defined the concept of socio-spatial phenomenon and argued why we had to understand it properly. We cannot see the socio-spatial phenomenon without a conceptual framework. The socio-spatial phenomenon is not an imaginary construction but the real event taking place in our life space. As we cannot see anything without focusing from a point of view, we cannot see a reality without preparing a conceptual framework. Here, a paradox creeps in, because we cannot see a phenomenon from any other points of view once we occupy a particular standpoint. Therefore the question arises whether the entity which we regard as a socio-spatial phenomenon is really real or whether we are merely gazing at an illusion, imprisoned within the prepared conceptual framework. We might try to escape from this trap by arguing that as far as the conceptual framework consists of an objective system of knowledge created by the collective efforts of human wisdom, the reality we see through the conceptual framework is objective knowledge which can be commonly accepted. But still, this justification is not so easily defensible because, whether the conceptual framework is a work of collective mind or not, the fact that we have a conceptual

framework means that at least we choose one point of view among many possible ones.

Moreover, the reality is not objects separated from the knowing subject by a vacuum. However untouchable or veiled from direct sight, we live with it or within it. The conceptual framework is not a creation of the knowing subject in the absence of objects but a result constructed by the interaction between the knowing subject and objective data. In this sense, the socio-spatial phenomenon as a reality seen through a conceptual framework is not an object standing aloof outside our life space but the process of events within which we live. The fact that we constructed a conceptual framework, ~~in a way,~~ means <sup>in a way,</sup> that we are conditioned at the same time to lose other possible information instead of attaining a level of certainty for getting information organised in a specific way. As far as one is determined to see anything real by providing a conceptual framework, one is at the same time destined to be prejudiced in facing reality. Imitating Lao Tzu's phraseology, seeing is not-seeing and not-seeing is seeing. Or, one who really sees anything sees as if he sees nothing. Lao Tzu's teaching does not tell us to do nothing but reminds us not to take the conceptual framework for granted and to regard it as one among many possibilities.

As we have already cleared ground for the building of a conceptual framework, we allocate chapters 2 and 3 to the construction of skeletal frames of the conceptual scheme and then move, in the following two chapters, to provide practical frameworks for the investigation of real examples, interactively reflecting the skeletal schemes developed up to this stage. Then there follow two chapters(6 and 7) in which the necessary procedures to convert plans of house compounds into analysable objects are introduced. The networks thus produced are analysed and interpreted, in chapter 8, through the measurement of structural parameters for each house compound and the use of statistical inference. This leads to the

explanation of a number of socio-spatial phenomena in the surveyed villages.

In the final chapter, a brief discussion is given of the general problems of the study of the interaction between space and society in the light of arguments which have been developed in the thesis. Appendices include the plans of house compounds of the surveyed villages, diagrams and networks constructed by graph-theoretic representations through reading plans, tables, and graphs produced in the process of analysis, and some mathematical notes. All Appendices except the mathematical notes are bound in volume II.

In chapter 2, we define the concept of the socio-spatial dialectic as the structure/process duality which underlies and is synthesised into socio-spatial phenomena. The concepts of structure and process are thoroughly examined insofar as they are relevant to the socio-spatial dialectic, leading to the explanation of how the socio-spatial structure and the socio-spatial process are posed and opposed to each other to be resolved in the socio-spatial dialectic.

Chapter 3 deals with the essences of the socio-spatial dialectic of which the interaction between nature and culture is crucial. This gives birth to cultural objects, whereby cultural ideologies are involved in the way that collective and individual representations interact. Here, the Principle of Least Effort is presented as the medium which connects and distinguishes the two domains of nature and culture. In the domain of culture, the interpretation of which would be the most economic way to reach a goal with minimum energy expenditure is different from society to society whereas in nature, the Principle applies equally to every physical phenomenon. Before we concentrate on how this dialectic interaction between nature and culture manifests in the real life space, we finally define the 'socio-spatial entity' in which all the arguments on the socio-spatial dialectic converge. The 'socio-spatial entity' is not a new invention but a discovery marked

through the process of refining a conceptual framework for the explanation of man/environment interactions, or specifically, the interface of space and society.

In chapter 4, we bring the conceptual scheme into the life space defined as the socio-spatial field of communication where space organisation is considered to be ordered by built-in measures corresponding to the rule structures of the flow of energy-information between individuals and between groups in that society. Here, also, the term energy-information is explained. Space organisation is one medium for the effective exchange of energy-information in social processes. For the amorphous space in the state of nature to be ordered, the first step is to differentiate it into individual regions of space and to connect them under the maxim of part-whole relations. The differentiation of space takes place along the axis of a dialectic in which complementary opposites are resolved into another whole. The part-whole relation is regarded as an epistemological schema through which we can understand the process of interaction between space and society in the socio-spatial field of communication. We continue by investigating the logic of parts and wholes as they are implied in the explanation of subject matter in various fields and infer that the logic of parts and wholes is the relational structure which underlies all phenomena from nature to culture, notwithstanding the world of human thought. Naturally, this logic pervades all aspects of the socio-spatial dialectic.

In chapter 5, before we introduce measures for converting real examples of the socio-spatial field of communication (four Korean villages) into analysable objects and then analyse and interpret them in the following three chapters, a general description of Korean traditional villages is presented with a particular reference to the surveyed ones. In so far as the pre-modern Korean society largely had no urban character and had been mainly based on farming village communities, this description may generally be extended to that of traditional Korean society. Here, two complementary but



opposite social spaces which consist of the two social strata, Yang-Ban and Sang-Min, are regarded as two poles of the socio-spatial field of communication. People of a community who are bound to these poles retain their characteristic modes of social cohesion and cultural ideologies. By exposing these aspects of Korean traditional village communities, we are able to make the conversion of real examples into analysable objects and the interpretation of the result of the analysis on a firm basis of concrete reality.

In chapter 6, we present a brief account of the surveyed villages and clarify the concepts needed in the following chapter for converting real living spaces into analysable objects. The description of the four surveyed villages follows the framework set out in chapter 5, concentrating mainly on the two complementary social spaces which exert strong influences on the shape of the living environment of the villages. The implications and limitations of adopting the abstract measures of graph theory are then considered. These arise when converting the topological relations of differentiated individual regions of each house compound into networks. Here, emphasis is given to the importance of socio-cultural understanding even when — or particularly when — abstract mathematical language is introduced. This point of view prevails in the arguments which follow concerning the concepts of energy-information and experimentation. The examples which are given of identifying individual regions and the connections between them, show the meaning of these concepts within the socio-spatial dialectic.

In chapter 7, a method is introduced of converting real examples of the socio-spatial field of communication into individual region graphs by applying graph-theoretic representations. This is carried out on the assumption that any socio-spatial field of communication constitutes a network of individual regions which the people of that community differentiate and connect into an organised whole. To represent individual regions by vertices and their connections by edges, criteria for the identification of individual

regions and their connections are established. The spatial grammar is too subtle to be categorised within fixed criteria for identifying individual regions of space and their connections when reading the house compound plans. This means that it is crucial to use a method of analysis in which the data are arranged and interpreted in a logically coherent manner through an understanding of the spatial grammar of the community in question. This understanding is enhanced by the observation of how the people use their living space in terms of its physical and social characters.

In chapter 8, individual region graphs of the surveyed villages are analysed and interpreted. Since the distinction between the two poles of the socio-spatial field of communication is rather blurred in the real life space, we choose a set of typical Yang-Ban (high culture) and another of Sang-Min (low culture) house compounds to constitute artificial collections of households each of which represents, though in an idealised way, a single social stratum. A comparison of these helps towards understanding the interaction of the two poles in the real Korean villages. To analyse the individual region graphs, we set up some mathematical models using which the necessary measures can be established. Once these measures are applied to each house compound, the statistical analysis of the values of parameters for each village as a whole is essential insofar as a village community as a socio-spatial field of communication is represented by the collection of these values representing individual house compounds. The statistics of the spread of values of parameters in each village and the regression coefficient indicating the general trend of related parameters is examined. From this analysis a clearer picture of the socio-spatial field of communication emerges by referring back, for interpretation, to the conceptual frameworks so far developed. All of the arguments converge within discussion of the general implications of the socio-spatial dialectic with a focus on the results of the analysis of the Korean villages.

Finally, in chapter 9, general problems and issues concerning the socio-spatial dialectic are discussed and suggestions are made for further research. This discussion, we hope, will clarify the limitations of the arguments developed in the thesis as a basis for the study of the interaction between space and society. Also the generalisability of the interaction of two poles to quite different societies is argued.

## CHAPTER 2. THE SOCIO-SPATIAL DIALECTIC

### 2.0. INTRODUCTION

In the previous chapter, we introduced some basic ideas concerning the study of the interaction between space and society. This led us to the concept of the socio-spatial phenomenon which consists of the two complementary interacting domains of social process and space organisation. It was also pointed out that we needed a proper conceptual framework if we are to be able to understand the socio-spatial phenomenon. To grasp how social process and spatial organisation interact to manifest socio-spatial phenomena, we introduce in this chapter the conceptual tool of the socio-spatial dialectic.

The socio-spatial dialectic might be referred to as the structure/process duality which underlies and is synthesised into socio-spatial phenomena. This implies that it is crucial to consider both a fixed framework(structure) through which to look into the phenomena and at the same time the changing nature(process) of the phenomena for the understanding of the interaction between spatial organisation and social process. We cannot gain this understanding without studying the fundamental ideas of structure and process. This invites us to consider the fields of anthropology, linguistics, and philosophy in which these concepts have been cultivated. Among others, we examine the key structuralist ideas of Lévi-Strauss and Chomsky because they put them into a coherent scheme with which to build rigorous theory. In particular, their approaches to the study of the social phenomena provide us with insights not only into the basic concepts of structure and transformation but also into the approach of the study.

However, the concept of change ingrained in these structuralist ideas is not comprehensive enough with which to conceptualise and

investigate socio-spatial phenomena. To illuminate the nature of change in reality, we turn to some metaphysical arguments, mainly those of Hegel and Whitehead. Apart from in the tradition of Western philosophy, the nature of change has long played a central role in the discourses of every faction of Eastern philosophy. Among all the metaphysical reflections on the nature of change from East to West, the concept of Yin-Yang is most pervasive in explaining every phase of reality according to which every entity interacts with its own complementary opposite to be resolved into another whole.

Once a clearer idea is attained about structure and process, we can build the concepts of socio-spatial structure and socio-spatial process and their relations. This leads to an understanding of how the interaction between spatial organisation and social process is structure/process dependent in order to be manifested as socio-spatial phenomena.

## 2.1. THE SOCIO-SPATIAL STRUCTURE

### 2.1.1. The Concept of Structure

The term structure is regarded as synonymous with form seen inside, by which it signifies the effective pattern of relationships as the antithesis of matter.<sup>(1)</sup> However, the concept of structure is unfortunately ambiguous because it has taken too many different connotations for a common denominator to be in evidence. In fact, the variety of connotations arising in different disciplines gives doubts as to the existence of a single meaning which could be attributed to it, or of a single method which could be termed the structural approach.

Structuralism has played an important role in broadening the thinking of many disciplines, since it has proved to be a successful method of model building, culminating, for instance, in the anthropological works of Lévi-Strauss. Drawing his ideas from

structural linguistics, Lévi-Strauss focussed his attention on the analysis of kinship systems and of myth. As Leach argues,<sup>(2)</sup> he replaced the Durkheim-Radcliffe-Brown metaphor by which the articulation of society is seen as 'like that of an organism' by the proposition that the articulation of culture is 'like that of language'. This notion transformed the aims, methods and subject matter of cultural anthropology and its relation to other disciplines and, during the last two decades, discussions of culture theory have shown a preoccupation with the idea that cultures are systems of symbols and meaning.<sup>(3)</sup> As the application of this method proliferated into other disciplines, the concept of structure became polysemic.

Although the meaning of structure has been heightened and diversified as it has pervaded every field as a way of thinking or as a methodology of explanation, its basic concepts are not new. The trend towards a structural way of thinking has been germinating in every discipline since the 19th century as a way of meeting various critical objections to the then current compartmentalisation of specialised fields : atomism, diachronically oriented ways of thinking, historicism, and functionalism.<sup>(4)</sup> Furthermore, the basic idea of structure has been around since Heraclitus' time as a way of looking at cosmology.<sup>(5)</sup>

Piaget enhanced our understanding of the general ideas of structuralism when he defined structure by the three concepts of wholeness, transformation, and self-regulation. These are supposed to be the common denominators underlying the structural approaches of various disciplines. But an inductive definition such as this cannot be meaningful beyond certain limits because it is impossible to find a unified meaning of structure applicable to all disciplines. Under whatever nomination or connotation the structuralist approach has been applied to a particular subject matter, the important thing is whether it is based on deep insights into the subject matter in question and has produced a coherent explanation with logical consistency. As Boudon argues,<sup>(6)</sup> there is no structural method

in the sense in which there is an experimental method. Neither Lévi-Strauss nor Chomsky achieved their results by using some mysterious isolable structuralist method. They did, however, profit by a long research tradition in which they applied a fertile scientific imagination and a series of conceptual tools more refined than those available to their predecessors.

### 2.1.2. The Structuralist Approach in Linguistics

The concepts of structure which originated from structural linguistics are given great importance in current structuralist thinking not because they had a substantial influence on that seminal piece of modern structuralism, Lévi-Strauss' method of social anthropology, but because, in their own right, they are the source from which clear concepts of structure stem. Linguistics provides the fundamental insight that socio-spatial phenomena can be seen as a manifestation of a relational structure of a certain kind of communication. Saussure proclaimed that linguistics is only a branch of the general science of signs which he named 'semiology'. He introduced structuralist ideas into linguistics with the view that systematic relations of parts of a whole are of critical importance in language.<sup>(7)</sup> The main structural relevance of Saussure's theory is that the atomic units of all levels in every language, whether it be phonemes, morphemes, or semantemes, have no identity independent of others. They exist only in terms of paradigmatic and syntagmatic relational structure, deriving word-forms and meaning from their combination with other units in the particular languages in which they are actualised. Saussure gives first priority to the synchronic aspect of language in that the 'systemness' of language comes from the relational structure at a given point in time but not from the historical development of the same language.<sup>(8)</sup> The concept of the arbitrariness of linguistic signs, which suggests that the association of the 'signified' (concept) with the 'signifier' (sound-image) in forming a sign has no intrinsic relation, also endorses, for him the synchronic perspective, because, within this perspective, forms given to

substances (concept, sound) in the same language at the different points in time belong to different language systems ('langue').

The structuralist ideas which are adopted by Lévi-Strauss mainly come from the theory of phonology of the Prague School led by Troubetzkoy and Jakobson. This school regards the Saussurian distinction between the synchronic and the diachronic as illusory and treats the arbitrary character of linguistic signs as only provisional. Its structural strategy aims at four basic operations : the study of unconscious infrastructure, the relations between terms as the basis of analysis, the introduction of the concept of system, and the discovering of general laws.<sup>(9)</sup> In this structural phonology, sound features have three main functions : culminative, delimitive, and distinctive.<sup>(10)</sup> The 'distinctive feature' of sounds is based on the oppositions which underlie the sound elements, such as vowel/consonant and compact high-energy sound/diffuse low-energy sound. The structuralist theory does not concern itself with the substance-like sound elements or phonemes but with functional features. A small number of distinctive features as language universals makes it possible to distinguish sound elements from one another in all natural languages. The unit elements of sounds cannot be attributed to any intrinsic identity of meaning in themselves outside their distinctive relations. The system of sound in language can be reduced to a formal structure in which a series of distinctive relations are ordered into 'relation between relations'. These are just the binary oppositions of distinctive features which Lévi-Strauss exploited as an analytical method in his study of myth.

Structural linguists postulate that there are deep universals in every human language, which underlie the varied superficial aspects of language. This is the kernel concept by which linguistics contributes to structuralist ideas. By analogy this concept suggests the idea that there are deep universals at the back of the surface diversity of cultural phenomena. Noam Chomsky introduces this concept as a base for his study of generative grammar with the



theory of transformation. Chomsky distinguishes between substantive and formal universals.<sup>(11)</sup> The substantive universals of syntactic, semantic, or phonological components, or the interrelations among the three components, can be identified when they are defined on the basis of a general theory, though these features manifest variously in particular languages. More emphasis is given to the formal universals : that is, to certain abstract principles which show a general property in forming rule structures and their operation in the grammar of particular languages. The syntax of a language consists of a base system that generates deep structures and a transformational system that maps these into surface structures. The deep structure is the underlying abstract structure that determines its semantic interpretation. The surface structure is the organisation of linguistic units from which phonetic interpretations are drawn and which give birth to the physical form of the actual utterance. The syntactic component generates a surface structure from a deep structure through the transformation rules. The surface structure is drawn by the application of formal operations called 'grammatical transformations' to elementary objects. The meaning of a sentence comes out of deep structure by means of semantic interpretation. The phonetic interpretation of the surface structure of sentences is derived by the application of phonological rules. The deep structure is common among particular languages but the transformation rules may differ from language to language. The surface structure seldom corresponds to the meaning relations of actual utterance. Only the deep structure conveys the semantic content of the sentence.

### 2.1.3. The Structuralist Approach in Anthropology

Lévi-Strauss is a rationalist as opposed to empiricists who regard the directly observable objective facts as their subject matter. Rationalists are more concerned with the structure of ideas as a social reality : that is, the mental construction of a logical structure which is believed to underlie the observable empirical facts. Lévi-Strauss' structuralism cannot be attributed

to either side of the opposition between subjectivist approaches (phenomenological, the rationalism of orthodox philosophy) and objectivist ones (positivism, empiricism) since Lévi-Strauss rejects both the subject's conscious experience of reality and the empirically observable objective facts of social phenomena as reliable sources of scientific knowledge.<sup>(12)</sup> He developed his own characteristic procedure, starting from the investigation of social phenomena at an empirical level, building deductive models at the supra-empirical level and then coming back to apply them to the subjective (imaginative) analysis of social phenomena at the empirical level of reality. For Lévi-Strauss, social structure has nothing to do with reality 'but with models which are built up after it'.<sup>(13)</sup> He criticizes Radcliffe-Brown's organic analogy of social structure in which social structure is seen as the directly observable network of social relations. Social relations are mere raw materials from which the model of social structure can be drawn, and social structure cannot be reduced to the ordered sum of social relations. In the study of social structures, structures are models, the formal properties of which can be compared independently of particulars of their parts. The question of structure, here, belongs to the methodology of science in general.

For structural anthropology, priority is given to model building against empirical observation in the initial stage of research, finally leading to 'mechanical models' instead of 'statistical' ones.<sup>(14)</sup> The model is distinguished as mechanical or statistical, depending on whether the elements of the model are on the same scale as the social phenomena concerned or not. The concept of time is reversible and non-cumulative in 'mechanical models' whereas it is irreversible in 'statistical models' as it is in historical studies. In the procedure of mechanical model building, the approach is supposed to be based on hypothetico-deductive inference while the model cannot be constructed by statistical inference from gathered data of the phenomena scattered in time and space as in natural sciences. In his theory building, Lévi-Strauss employs this concept of mechanical model for the investigation of the unconscious

domain of cultural phenomena. Within the perspective of Lévi-Strauss' conceptual scheme, explanation of the unconscious origin of cultural phenomena is more important than that of the conscious one. He warns that some kind of conscious model formed in the collective consciousness can be a disguise against the genuine structure of phenomena which lies at the depth of the unconscious level. Surface phenomena or social norms are regarded as standing in the collective consciousness as a screen, hiding a deeper(or higher) transcendental structure which is stored in the unconscious mind of the group in society.<sup>(15)</sup> The symbolic meaning of socio-cultural phenomena is made possible by deep unconscious universals and the unconscious meaning is more important than the conscious one. Lévi-Strauss, however, concludes that we cannot totally ignore the conscious model, which is usually expressed as norms, as a part of the model building process.

#### 2.1.4. The Concept of Structure of Lévi-Strauss and Chomsky

Structuralist approaches in anthropology and linguistics, especially those of Lévi-Strauss and Chomsky, contain valuable suggestions for shaping a conceptual framework for the study of socio-spatial phenomena. Both share the assumption that there are deep universals behind the manifest diversity of socio-cultural phenomena, whether it be language, kinship systems or other cultural conventions, regardless of their differences in physical attributions and socio-cultural origins. In the linguistic version of the universal property, the abstract deep structure underlying the actual utterances, which are common to all languages, gives birth to diverse meaning systems(semantic interpretation) and to the physical phonetic forms at the surface level by the application of transformational rules which differ from language to language. The system of regularities in a language, according to Saussure, is believed to be produced by the collective and unconscious assumptions of the speech community.<sup>(16)</sup> Lévi-Strauss emphasised the unconscious model rather than the conscious one, because the deep transcendental structure is regarded as stored in

the unconscious mind of the members of a society. In the analysis of the myths of remote societies, the distorted messages at the conscious level are reorganised into a possible meaning system at the unconscious level by rebuilding the relational structure of transformations, because myths are regarded only as the conscious approximations of unconscious truths.<sup>(17)</sup>

Both Lévi-Strauss and Chomsky stand on the same ground in rejecting the emphasis on the inductive method of investigation in favour of a hypothetico-deductive model of explanation. The inductive method cannot discover the linguistic regularities between linguistic elements, for the identity of linguistic elements cannot be defined outside their relationship with others as a whole in the language in question. Language use is creative and has no upper bound whence an unlimited number of sentences can be generated by the application of transformational rules to a fixed number of linguistic objects in a language. Inductive inference cannot produce an explanatory theory of the generative capacity of language.<sup>(18)</sup> Anthropologists employ both deductive and empirical methods whereby the participant observers' subjective mental experimentation(operation) is transformed to an objective demonstration, leading to the construction of the abstract unconscious model. Social facts, here, cannot be dealt with as scattered elements as the inductive method does in the natural sciences. Social facts constitute a whole which are lived by men. 'The subjective consciousness is as much a form of reality as objective characteristics'.<sup>(19)</sup> The elements of the model are treated as a whole and on the same scale as the real phenomena at stake.

Both Lévi-Strauss and Chomsky give priority to the synchronic aspects of structure rather than to the diachronic ones. This does not mean that consideration of historical aspects and the concept of change inherent in structure are ignored or excluded a priori. Both studies could be said to be located outside the time dimension. When anthropologists build models, in general,

time is reversible and non-cumulative and the concept of time is repressed, since they do not question the time-bound evolution of the structure but are concerned with the transformation of rule systems within the structure. The transformation need not necessarily be a temporal process as in the case of mathematical or logical structures. When a language is used, all that encounters the speaker is the state of language at that point in time but not the content of its successive development.<sup>(20)</sup> Changes in elements never affect the system as a whole directly as there is no intrinsic relation between the initial fact and the effect that the change of these may have on the whole system. Synchronic aspects are given priority because language is a system in which the units cannot have any meaningful identity independent of their relation with others within the whole matrix of relations at the point of time in question. Synchronic facts are general and are related to the regularity of the system as a whole whereas diachronic facts are particular and accidental. As we can see in Chomsky's theory, while it deals with the synchronic facts in a suppressed time dimension, the concept of change is a crucial factor where transformational rules transform deep structures into surface structures. When Lévi-Strauss deals with kinship system and myths, there is no differentiation of depth in the sense of a time scale being involved among the elements ; there is only distinction between invariant rule structures hidden at the deep unconscious level and variant manifestations of these at surface conscious level.

#### 2.1.5. Socio-Spatial Structure

As a basis for our study of socio-spatial dialectic, we reinterpret the kernel concepts of structure and the approaches developed in structural anthropology and structural linguistics, especially those of Lévi-Strauss and Chomsky. Among other things, the points which are most suggestive for the study of socio-spatial dialectic are : the understanding of structure as a relational system, the priority given to the synchronic aspects of structure, the deductive method of investigation, the concept of a 'mechanical

model', and above all the existence of deep universals and their manifestation in surface structure(conscious) by the application of transformational rules on the deep structure(unconscious).

There will be no anomalies in adopting the conceptual schemes successfully developed in socio-cultural theories for the study of socio-spatial dialectic in so far as we consider socio-spatial phenomena to be socio-cultural phenomena. But these concepts and approaches must be redefined and readjusted to come to terms with the conceptual framework of the socio-spatial dialectic. It is not merely by borrowing terms but by feeding the general scheme of ideas into the concrete subject matter that the problems of dealing with spatial organisation and social process as two separate facts will be removed from the study of socio-spatial phenomena.

As the socio-spatial phenomenon is a cultural phenomenon like those of language, kinship system, myth, etc., it can hardly be analysed fragment by fragment. The fragments have no meaningful identity outside the relational structure underlying the phenomenon. Also, the mean values extracted from the common attributes of scattered fragments of the phenomenon cannot suggest a reliable explanation. As for the distinction between 'mechanical model' and 'statistical model' as they are implied in the structuralist criteria for model(namely : the scale of the elements of model in relation to phenomena concerned, the concept of time as to whether it is reversible or not, and whether the model building follows hypothetico-deductive or inductive inference) the distinction is a matter of degree. For example, if we happen to investigate the socio-spatial phenomenon at its micro or in-between level(see chapter 6), we can remain within the range of the criteria for 'mechanical model'. Once we deal with the socio-spatial phenomenon at its macro level, it would be impossible to hold to the criteria insofar as there is too extensive a range of variables involved to keep the elements of model at the same scale as the phenomena. If we resort to selecting a typical 'sample space' and extend the explanation of the 'mechanical model' drawn from the 'sample space' to the phenomenon at a larger scale, we cannot avoid

introducing statistical concepts in one way or another. Even when we keep the model at the same scale as that of the socio-spatial phenomenon of micro level, the elements or groups of elements of the model can also be identified as independent unit wholes at a certain level so that the adoption of statistical concepts is inevitable to some extent.

In this respect, the study of the socio-spatial phenomenon is different from that of kinship, myth, or language, as they are seen in structuralism, where unit elements(or patterns) repeat extensively and exhaustively up to the whole network of relations. For our study, it is inevitable that some aspects of statistical inference are introduced while keeping the investigation at the same scale as the phenomena concerned. For instance, we treat the socio-spatial phenomenon at household level as a whole before it is integrated into another whole at village community level. We must not overlook the dangers of reductionism involved in inductive reasoning and statistical inferences, even though we believe that these are complementary to deductive reasoning and 'mechanical model' building. Although we agree with the warning against giving too much emphasis to a one directional, vertical evolutionary time dimension, the concept of repressed, horizontal, and reversible time equally does not fit the notion of change in Yin-Yang dialectics which we adopt for our conceptual scheme. The process of change in Yin-Yang dialectics needs both horizontal(cyclic) and vertical (evolutionary) times.

At the surface conscious level, the socio-spatial dialectic manifests differently from one culture and society to another. Apart from the varied manifestations at the surface level of socio-spatial dialectic, there are supposed to be the universals at the deep unconscious level. This does not necessarily mean that there are certain rule structures universally present in every culture and society but that there are some general principles which shape them and their operation in the socio-spatial dialectic of a particular society or culture. We may call these rule

structures at the deep unconscious level of the socio-spatial phenomenon the socio-spatial structure.

In the study of the socio-spatial dialectic, the rule structure implies how people in a community differentiate space into individual regions of space and connect them following the logic of parts and wholes(see chapter 4). The socially meaningful system of the socio-spatial dialectic will emerge through the social interpretation of the socio-spatial structure. The spatial interpretation of the socio-spatial structure reveals the space organisations at the manifest surface level. When we describe the socio-spatial structure as deep and unconscious, this has something to do with the fact that the rule structures of the socio-spatial dialectic are not immediately self-evident because these are not the products of any premeditated intentions by individuals or groups of people but are the on-going process of part-whole relation seen through a conceptual framework. The notion of change in the socio-spatial dialectic is not a transformation from one state or entity to another in the course of time but the dialectical process of interaction between an entity and its own negation(opposite), leading to a new category of whole.

We can see now why semiotic or semiological theories in architecture have failed to present a genuine explanation of meaning in architecture. These theories mostly have been based on naive terminological substitutions — borrowing terms from linguistics — without considering the process/structure-dependent transformations bridging the socio-spatial structure and surface phenomena and the origin of the meaning system rooted in deep rule structures. Also, they omit the point that the socially meaningful system and spatial organisation are not in cause-effect relation or in one-to-one correspondence between the pairs of elements in two sets, but come from the deep rule structure(socio-spatial structure) through a transformational process, consequently giving birth to both social interpretation and spatial interpretation. We can say that social process and spatial organisation are process/structure dependent,



forming two facets of an inseparable socio-spatial phenomenon (the manifestation of socio-spatial dialectic).

The property of latency<sup>(21)</sup> in the physical environment and the fact that the process of space organisation and social process have their own autonomy to a degree seem to support the argument for the structure-bound character of socio-spatial dialectic. The process of space organisation has a certain independence in shaping the physical environment without necessarily reflecting social processes. Similarly, a substantial portion of the social process operates independently of the spatial organisation. Society can rely on other measures as much as on spatial means for maintaining its structural stability. These measures might include socio-cultural conventions such as, to take just a few, language, marriage rules, rites, customs, laws, and taboos etc.. These facts imply that, at the manifest conscious surface level, social process and spatial organisation do not have any determinate causal relations and no direct correspondence between the two groups of elements is to be expected.

The deep universals provide the common general principles of socio-spatial dialectic for all societies and cultures. But, the ways of transformation are different among them, producing varied surface manifestations of socio-spatial dialectic, that is, socio-spatial phenomena.

But the concept of change ingrained in the ideas of structuralism is not comprehensive enough to open up the conceptual scheme to reality. The nature of change is, here, subjugated to the property of fixed structure. Within this framework change only serves to confirm a final structure and only to operate in the limit of this structure. At the price of emphasising structure, the fact that structure itself is always in the process of structuring has not been given fair attention. From this point of view, we are going to concentrate, in the next section of this chapter, on the concept of change as the antithesis of structure.

## 2.2. SOCIO-SPATIAL PROCESS

### 2.2.1. The Notion of Change in Structure

The concept of structure often connotes ideas such as invariant form, pattern and order in nature and socio-cultural phenomena. This view is a useful construct on phenomena implying an unyielding static principle. The emphasis on fixed entities and unyielding terms suggests that there are invariant structures hidden beneath the apparent, superficial phenomena. But with such a static understanding of structure, we cannot grasp the ever-changing relations which are always in the process of simultaneously structuring and being structured. Structure is not a fixed entity but a system of relations which is in the process of continuously evolving. It is natural that the successful structuralist theories in anthropology and linguistics have been those which concentrate on the synchronic aspects of structure, because there can be no fixed route which the changing process of rule structure rigidly follows diachronically. The process is open-ended in so far as structure represents the ever-fluctuating relations between parts and the whole which consists of those parts. It will be futile to try to find the diachronic aspect of structure, as it could only lead to the study of different structures at different points in time. The study of diachronic aspects is appropriate for the study of change of the parts but the change of the parts does not directly correspond to the change of the whole.

Piaget sums up the basic ideas of structure in three kernel concepts : wholeness, transformation, and self-regulation.<sup>(22)</sup> The wholeness of structure does not derive from the aggregation of the properties of its elements. The laws governing the structure cannot be reduced to those of atomic elements of which the whole is constituted. The structure has the property of undividable totality which is distinct from the properties of its components. Then, are the structures preformed entities or are they in the process of formation? The polarity of 'always structuring and

being structured' leads to the idea of transformation. This introduces the notions of change and process to the concept of structure so as to save it from collapsing into the mere formalisation of explanation. Here, the notion of change and process need not necessarily be temporal. For example, mathematical structures are believed to contain the notion of change not in a temporal sense but in the sense that any content is form relative to some inferior content.<sup>(23)</sup> The third concept, that of self-regulation, has been well applied and developed in cybernetics as the key idea of the regulation mechanism and in general systems theory as the homeostatic feedback mechanism. By self-regulation, the stability of the structure is self-maintained under the continuous process of structuring. In this perspective, the transformation inherent in a structure does not lead to the destruction of the system but maintains the stability of the structure while producing indefinitely many new elements. When Piaget defines structure as 'a systematic whole of self-regulating transformations' the notion of change relies heavily on the concept as developed in systems theory and cybernetics.

General systems theory has its root in the idea of isomorphism in science which implies that a general principle holding for a science or a type of system can be extended to apply to another science or type of system.<sup>(24)</sup> As it has mainly developed in response to the requirements of engineering and the applied sciences, extending into the field of practical needs, systems theory primarily deals with the flow or exchange of physical entities (energy) within a system, between systems, or between a system and its environment, conceptualising the mechanisms involved in generalised terms. The main idea of this theory is self-sufficing when applied to cultural phenomena but nothing more. With its practical or engineering bias, it limits the critical or creative interpretation of cultural phenomena. The concept of change adopted in this theory primarily consists in the idea of the homeostatic feed-back mechanism which is borrowed from the physiological operation by which biological open systems

self-maintain and self-regulate to maintain their structural stability. This is the concept with which Piaget defines the idea of change implied in structure. This interpretation limits the notion of structure within the rule-bound closed domain only for the sake of the conservation of existing property and structural stability.

A more comprehensive understanding of change can be secured by adopting the concept of process which emerges from ontological and cosmological discourses. By introducing the concept of process, the innermost source of movement inherent in structure can be reinterpreted. Process does not refer to the mechanism required to sustain the structural stability but itself constitutes structure. Structure is an abstraction of process through which entities exist and of which the universe is constituted. Here, structure and process are not conceived as conflicting concepts but as complementary ones indispensable in explaining socio-spatial dialectic.

#### 2.2.2. The Meaning of Process

Cosmology sets out to interpret the metaphysical generality of the universe. Cosmology is fundamental to the pursuit of sciences, whether they be natural or social sciences, because it provides the scheme of ideas for the ultimate nature of things. Without the guidance of the metaphysical scheme of ideas which cosmology sets out, all reasoning will suffer from inconsistent and contradictory presuppositions which arise from the varied possible options of interpretation of the final nature of things.<sup>(25)</sup> On the other hand, a conceptual scheme which is based on the prevalent cosmology of an epoch can prevent the launching of new scientific adventures until a revolutionary upheaval takes place leading to a 'paradigm' shift.<sup>(26)</sup> Following Whitehead's arguments, our coordinated knowledge is constituted by the combination of the 'Observational Order' and the 'Conceptual Order'. The 'Observational Order' is formed by the direct discriminations of particular observations.

The 'Conceptual Order' consists in our general way of conceiving the universe. The two Orders are complementary in that the novel side of one Order corroborates the weakness of the other Order which is exposed in the course of the interaction of the two Orders in the evolution of coordinated knowledge. The history of thought shows a paramount weakness in Observational Order. The speculative adventure of cosmology prevents Observational Order from remaining within the boundary of its 'delusive completeness', and induces the 'doctrines of science' to attempt to go beyond their delusive concept of 'finality'.

Metaphysical stances may be sharply distinguished depending on whether they seek the ultimate nature of things in the process of change or in the permanent property of entity. The characters of change and permanence of things cannot be torn apart but interweave to manifest the ultimate nature of things.<sup>(27)</sup> The cosmological question inevitably leads to the ontological question of existence which centers on 'what is is' (being) and 'how it comes to be' (becoming). Whitehead introduces the 'actual entity' to designate his concept of ultimate being which is 'really real' and so cannot be derived from other entities but exists in itself.<sup>(28)</sup> This term signifies the same metaphysical category as Plato's 'form', Aristotle's 'substance', and Leibniz's 'monad', but carries different ontological connotations. Here, 'actual entity' cannot exist without process. 'The process is the becoming of actual entities'. 'Being is constituted by its becoming'.<sup>(29)</sup> Actual entity is constituted by its process. Process is nowhere except in the sense in which actual entity comes into being. So process and existence presuppose each other. Whitehead's concept of process arises out of the consideration of the ontological meaning of actual entity.<sup>(30)</sup> For the really real actual entity to fully exist, something really real must be changeless in order for it to be what it is. Unless actual entity remains 'one and the same', it cannot retain its 'individuality' and 'self-identity'. In those terms, changelessness becomes the fundamental metaphysical feature of an actual entity. Aristotelian logic attempts to

reconcile the features of change and changelessness by introducing the categories of 'substance' and its 'attributes' into metaphysics. Following Aristotelian substance-attribute metaphysics, the enduring attribute of substance persisting unchanged in its quality is regarded to be the actual entity. For Whitehead, this self-identically enduring attribute is not the actual entity but an abstraction or generalisation of common factors from the derivative entities.

Whitehead distinguishes two kinds of change.<sup>(31)</sup> One he calls 'concrecence', which implies the feature of change inherent in the constitution of a particular existent. The other kind is the 'transition' from one particular entity to another. The ultimate metaphysical feature of the actual entity is entailed only in the former concept of 'process' which constitutes the 'coming into being' of an actual entity. 'An actual entity is a process, and is not describable in terms of the morphology of a stuff'.<sup>(32)</sup> If the concept of process is devoid of changelessness, then how can the self-identity of an actual entity be secured in the continuous process of becoming? Whitehead argues that there can be no 'continuous process' as such in the process of becoming by the application of Zeno's paradox. Actual entities are epochal units of becoming. The succession of these distinct epochal units of becoming results in the 'extensive continuity' of the universe. The further application of Zeno's paradox even to the epochal units of becoming and so the infinite regress of supersession of the divided parts of the actual entity is pre-empted by adopting the idea of 'epochal whole' for the unit process of becoming. So the actual entity comes into being as a whole so as to maintain its self-identity. As far as the actual entity maintains its self-identity, the unit epochal whole is changeless. With the completion of its process of becoming, the actual entity only 'perishes' through its denial of change. In this way Whitehead contains features of both change and changelessness in his metaphysics of actual entity.

### 2.2.3. Dialectical Process

With regard to the ontological meaning of becoming of an actual entity, the concept of opposites (or actual entity and the negation of itself) provides some valuable implications for the concept of change.<sup>(33)</sup> If an entity comes into being, it could not have existed before. But, the entity which comes into being must have been rooted in what went before. So, it cannot have been rooted in nothing, nor in what was other than itself. We come, then, to the paradox that the entity in question must have existed before coming to be, and therefore could not come to be. Aristotle dissolves this paradox by introducing the distinction between substances and attributes in which the constitutive characteristics of substance remain unchanged in the process of becoming of an entity while the non-constitutive ones are superseded. This unchanging 'subject' is the property which Whitehead regarded as a form of abstraction from the common factors of the derivative entities. From this point of view, subject-predicate logic cannot explain the coming into being of the actual entity and the concept of change involved in becoming.

The concept of opposites which earlier thinkers (predecessors of Aristotle) adopted to philosophise about change and becoming, is worth investigating further for its implications for the meaning of change and becoming. Waterlow points out three conceptual advantages in adopting the concept of opposites in which an entity comes into being from its opposite.<sup>(34)</sup> Within this conceptual framework, the entity in question does not exist before it comes into being. Only the opposite of the entity exists. And this opposite of the entity can be positively described not merely as something other than the entity, or as the absence of the entity, or as not-entity. The positive description of the opposite of the entity must be liable to refer to the entity, then likewise to its opposite. Therefore the opposite of an entity exists as a pair ; without one there cannot be the other. A. J. Bahm employs wholeheartedly the concept of opposites in his inquiry into 'the

nature of existence as experienced as well as of the experience of existence'.<sup>(35)</sup> In this inquiry, the categories of existence manifest in their polarity between the two opposite and complementary poles(or theses) of a pair of categories. The polarity and dialectic are interdependent in that the opposite categories of polarity interact in dialectical process to emerge into a new pole(or thesis). Here, negation is a category of existence. All things, at the same time, have both the positive and negative aspects in that each thing exists as not every other thing in many ways. In Bahm's 'organitic' theory, opposition or negativity is not a rigid category but inclusive and relative. The Hegelian dictum of 'aufgehoben',<sup>(36)</sup> is fully admitted. The negation of an entity is inherent in its own nature as far as the entity is not all that is. Every entity has the negation of itself inherent in its own nature. The mutual negation of antitheses is a categorical aspect of the identity(selfhood) of every entity.

Hegelian dialectic includes the pair of categories which negate each other in a synthesis to an elevated concrete category. The opposed categories are regarded as one-sided abstractions from a concrete whole. At the elevated level of category of synthesis, the mutually exclusive characteristics are removed whereas both opposing categories preserve their identity while they are negated at the same time. The mutually opposing categories, Being and Nothing(or not-Being), are distinct and inseparable in their unified category of Becoming and each disappears in its opposite.<sup>(37)</sup> Hegel regards the ultimate task of metaphysics as to seek the understanding on the 'Absolute reality' which is infinite.<sup>(38)</sup> He saw the problem of traditional philosophical speculation as an attempt to seek the understanding of 'Absolute reality' by elaborate definition of finite categories which cannot reach to the infinitude by any means. The finitude of categories, which are embedded in their mutually exclusive character, can be overcome by the introduction of the category of whole in which the exclusive characters are removed, each category maintaining its identity. Hegel's dialectic was an answer to the problem of comprehending the



absolute reality of infinitude, while using the finite categories of understanding. Hegel urges that the category of universals cannot be reduced to a category of particulars and both universals and particulars cannot be separated but are interdependent.<sup>(39)</sup> This assertion supports the inherent coexistence of contradictory characters in the same entities in that the two opposed terms can both be applied to one and the same entity. The categories do not exist in a static isolation. In the dialectical process, the opposing categories interact with each other, moving to a category of synthesis which contains both negating posits, and, overcoming the mutual negation, reaches to a category of whole. This new category again transits to another level of category through the same dialectical process, and this process continues until the process leads to the 'absolute whole'. The concept of dialectic addresses the process of change which is operating incessantly between opposite poles inherent in the nature of actual entity in the universe.

#### 2.2.4. Yin-Yang Dialectic

The cosmology of neo-Confucianism embodies the dialectical process manifested in the polarity between the opposed and complementary posits which are inherent in the nature of things as an ontological condition of the universe. The concept of Yin-Yang, which is the core of this cosmology, is not an invention of one school of Chinese philosophy. The origin of Yin-Yang goes far back beyond all the factions of Chinese philosophy. Even long before the school of naturalists (Yin-Yang Chia), led by Tsou Yen (350-270 B.C.), systematised the Yin-Yang concept, the idea had been floating about, not only influencing all philosophical discourses but also pervading all facets of life ranging from divination and the mode of farming to social norms of ethics and human relations.<sup>(40)</sup>

Yin-Yang philosophy is considered to have grown out of early village life and agricultural cults in China.<sup>(41)</sup> The village life of peaceful regularity and social solidarity is believed to be

the archetype from which the principle Chinese conception of the world and cosmos originated. The division of seasons and their change during the year, the complementarity of sexes in their life, and the characteristic phenomena of the surrounding world(earth, heaven) which are intimately related to their life situation, are believed to have contributed to the gestation of the Yin-Yang concept. The order and regularity required for agricultural production in village life made the people regard order and regularity in the cosmic process as the highest good. Ethical regularity and cosmic regularity are regarded as one, while man is not separated from the world. Within the Yin-Yang concept, the human world must be in tune with the harmonious process of the cosmos in so far as man is considered to be a part of the universe.

The Yin-Yang theory, which had evolved through the development of Chinese cosmology, appeared first in philosophical terms in I Ching.<sup>(42)</sup> The initial version of I Ching is said to be due to a legendary figure in Chinese history, Fu Hsi, developing to the later refined system of thought which influenced various schools of philosophy and was in turn influenced by them. The I Ching is certainly not merely a system of divination but is a way of looking at the world, which gives deep insight into the ontological and cosmological dimensions of the universe.<sup>(43)</sup>

The idea of integrative wholes characterised bilaterally is the all-embracing concept in Chinese culture, which underlies all the philosophical schools such as those of Confucianism, Taoism, and Buddhism. The dialectical process of complementary opposites follows a fixed cosmic pattern which oscillates between the two poles. The Yin-Yang philosophy is not a commitment to a dualism, as it may sound, because the opposite poles(such as man and nature, being and nonbeing, quiescence and movement, or Chhi and Li) are regarded as complementary and necessary partners rather than as hostile and incompatible. The polarity of Yin-Yang designates the antithesis between male and female, masculine heaven and feminine earth, 'the Creative' and 'the Receptive', the light and the dark,

'firm' and 'yielding'.<sup>(44)</sup> The two elements of each pair act and react with each other in a harmonious process, reaching towards the resolution of conflict. In the symbol system of I Ching, the two poles of Yin and Yang are represented by the yielding divided line and the firm undivided line which combine to form the hexagrams by the combination of six lines. Each line carries the polar tension. The firm lines are transformed to become yielding and the yielding lines alter to become firm : the lines transform into their opposites. Thus, the Yin-Yang symbol system in I Ching signifies the dialectical process of change in the phenomenal world. The negation(opposite) of an entity, event, or situation germinated from within itself sets as an antithesis of itself to become elevated to a new category of a whole.

Neo-Confucianism is believed to have synthesised Yin-Yang philosophy(from the Confucianist's point of view) into its cosmological and ontological concepts, absorbing the ideas evolved through the contact and interchange of views among Confucianism, Taoism, and Buddhism.<sup>(45)</sup> This synthesis culminated in, among other neo-Confucianists, Chu Hsi and his theory of 'Li' and 'Chhi'. Chu Hsi's cosmological speculation is based on the framework of cosmology expounded by Chou Tun-I, adapting similar ideas from other neo-Confucianists.<sup>(46)</sup> The 'Supreme pole'(Thai Chi) can be interpreted as the ultimate principle, or 'supreme ultimate'. As the Taoist's counter-part of this term, 'No Pole'(Wu Chi), implies, 'Supreme Pole' is not a visible final origin of myriad things but an invisible original principle like Tao. The Supreme Pole produces Yang by its movement. When movement decreases and reaches rest, the Supreme Pole produces the Yin. Reaching its limit, the rest returns to motion. There is no priority or posteriority between the 'Supreme Pole' and the 'Yin-Yang'. Without one of them, there cannot be the other. There is no temporal succession of one from the other but there exists the dialectical process in which an entity self-transforms by the interaction with the opposite character inherent in itself by its own nature. This is the ontological assumption on which the

cosmology of neo-Confucianism is constructed. This concept is well represented in Chu Hsi's phraseology ; 'When the Yin Chhi flows and streams forth, that is Yang ; when Yang Chhi condenses and congeals, that is Yin'.<sup>(47)</sup> Here, 'Chhi' is regarded as the essence of matter constituting the universe through its operation together with the principle of its operation, namely 'Li', impregnating the form.

A similar concept is present in chapter 40 of Tao Te Ching ; 'The movement of the Tao is to reverse ; - - - - -. All myriad things come from it as 'Being' ; that being comes from it as 'Non-Being'.<sup>(48)</sup> The two forces, Yin and Yang, acting and reacting with each other, give birth to Five Elements. The heavenly maleness of Yang and the earthly femaleness of Yin continue to interpenetrate and influence for the Five Elements to interact, transforming and generating the myriad things into being. And all the diversified myriad things return to the Ultimate Principle of Oneness, the Supreme Pole, to become the oneness of a whole. The idea of the oneness of Yin and Yang in the infinite harmonious process of creation appears in chapter 42 of Tao Te Ching<sup>(49)</sup> : the oneness bifurcates to twoness, the twoness gives birth to three, and the three brings forth the myriad things. The Oneness, the Twoness, and the Three, are usually interpreted respectively as Tao, Yin and Yang, and Heaven, Earth, and Man. But, after all, the manyness of the myriad things unifies to the oneness of the whole.

Needham finds the organic philosophy of Whitehead in the cosmology of neo-Confucianism, where the world is seen as the manifestation of integrative levels as in organisms ; wholes at one level being parts at another level.<sup>(50)</sup> Needham also points out that, whereas Western philosophy is inclined to find the self-identity of reality in unchanging attributes of substance, Chinese philosophy tends to identify the real entity with the process of a relational structure. The Aristotelian concept of substance-attribute, the logic of the excluded middle, the Eleatic's dictum of 'being is ; non-being is not' founded the mainstream of

Western philosophy which tended to find the real entity in changeless substance.<sup>(51)</sup> Chinese philosophy, on the other hand, as in the case of some Pre-Socratics including Heraclitus, Hegel and the later Whitehead, gave the priority to process or relation as an ultimate resort for the identification of the real entity. Chu Hsi's cosmological ideas well represent this concept in stressing that every entity possesses the negation of its own and the dialectical process of interaction between the complementary opposites leads to an entity of synthesis, in which parts join in oneness of wholes under the Supreme Pole(Ultimate Principle). The concept of change and relativity is the throughgoing and pervading theme in the world view together of Taoists, Mohists(Mo Chia), and Logicians (Ming Chia or School of Names).<sup>(52)</sup> In spite of arguments between themselves, they seem to agree on the following fundamental points :

a) all things in the universe ceaselessly go through the process of change, b) therefore, there is no fixed reference point in time and space so as to determine the identity of reality in unchanging substance, c) and, the idea of relativity extends to apply to the whole universe from nature to every human affair. Chuang Tzu wrote ; 'There is no end or beginning to the Tao. Things indeed die and are born, not reaching a perfect state which can be relied on. Now there is emptiness, and now fulness ; they do not continue in one form. - - - - - Decay and growth, fulness and emptiness, when they end, begin again. - - - - - With every movement there is change ; with every moment there is an alteration'.<sup>(53)</sup>

Chinese thought generally is oriented towards a concern for the this-worldly and so Confucianism and Taoism affirm the life and the world. Buddhism, on the other hand, negates them and so is other-worldly. For Buddhists, all the phenomena in this world are instantaneous illusion created by mind. Every thing in this world is in a state of flux and there is no permanent or self-identifiable entity. In this momentary phantasmal world where there is not even any selfhood, the only way to achieve enlightenment is in breaking the everlasting chain of 'karma' and

in negating all the illusions of phenomena, so in the end attaining absolute emptiness(Sunyata).<sup>(54)</sup> Although Confucianists and Taoists agree with Buddhists in the fact that everything in the world is in the process of change, for Taoists, there is an all-embracing principle, Tao, in the universe, which has the aspects of both Being and Non-Being and brings all things into being.<sup>(55)</sup> For neo-Confucianists, on the other hand, every entity possesses within itself the 'Supreme Ultimate'(Thai Chi) which makes the entity what it is, and the myriad things share one 'Supreme Ultimate' without division in its entirety.<sup>(56)</sup> In logical terms, all three schools of thought agree that an entity brings forth the antithesis of the entity or its own negation. Taoists and neo-Confucianists affirm that the dialectical process of interaction between the complementary opposites elevates the conflicting pairs to a synthesis of wholeness and so the continuation of this creative process is the manifestation of the Ultimate Principle(or Tao) residing in the universe. But, for the Buddhists, only the annulment of this dialectical process can overcome the repetitious production of the illusory entity.<sup>(57)</sup> The demolition of all polarity leads beyond the selfhood without the necessity of standing on one side or on the other. The negation of both affirmation and negation or total negation brings the sentient being to the absolute emptiness of totality.

#### 2.2.5. Socio-Spatial Process

The Buddhist's double negation amounts to a domain of epistemology rather than of ontology, where the antithetical properties of entity and its dialectical process of creation are transcended to lead to nothingness. But, for neo-Confucianists (and we can extend this argument generally to all other Chinese thought without going into details), the dialectical process of opposites is the ontological base of their cosmology, where matter in nature(Chhi) and form in idea(Li) supplement and alternate with each other, as Yin and Yang act and react with each other. In this cognitive structure, society and nature, and man's interaction

with them are understood as the manifestation of the same principle. Our investigation of the concept of process and structure shows that these two concepts do not represent antithetical views of the world but refer to the two complementary domains of approach towards the understanding of our world. Process explains the ontological base of entity in the ever-changing world where the entity contains its own negation in itself and the opposite poles interact to be elevated to a new entity through the dialectic synthesis. Structure concerns the epistemological grounds to come to knowledge of the ever-changing world in relational terms rather than seeking it in enduring substances as atomists advocate. Therefore, in our study of socio-spatial dialectic, process and structure are not antithetical terms but each refers to the same phenomenon from different directions of discourse ; the former from the ontological base of cosmology and the latter from that of epistemology.

The socio-spatial process comes to be actualised when space as a part of nature is transformed into cultural objects as social man differentiates the space of neutral state into interrelated parts of a whole with its own identity. The dialectic progression of part-whole interactions continues in the socio-spatial process whereby a whole with self-identity becomes a part of a whole at another level while people in a community manipulates space as a medium for the exchange of energy-information between individuals or between groups. Socio-spatial structure is nothing other than the rule structures which are derived from the investigation of this socio-spatial process through a conceptual framework.

Socio-spatial process represents the ongoing transformation which maps the socio-spatial structure at the deep unconscious level onto both the socially meaningful system in social process and the physical manifestation in spatial organisation at the surface conscious level, in which the dialectical synthesis of entity and its inherent opposite provides the immanent source of change.

In the conceptual framework of the socio-spatial dialectic, change is regarded as the foremost nature of entity and structure as

the temporary instrument to catch the ever-changing reality. From this point of view, process and structure are not mutually exclusive categories but complementary ones, for process refers to what things are and structure is concerned with how we know the things as they really are. In this respect, socio-spatial process explains how the socio-spatial phenomenon comes to exist while its two domains of the social process and spatial organisation interact with each other. On the other hand, socio-spatial structure is a conceptual instrument to apprehend the socio-spatial process, and within this framework the interactions between the two domains are looked at in a certain specific way. As the process of any phenomenon cannot be properly grasped except through a structured way and structure itself is always in the process of structuring (and, moreover, since the structure as a model constructed by human subjects cannot exist independently of the process for the understanding of which it is constructed) process and structure are dependent on each other. Socio-spatial dialectic attempts to contain these two interacting opposite but complementary categories of the socio-spatial phenomenon within a unified conceptual scheme.

### 2.3. CONCLUSION

Socio-spatial structure means rule structures at the deep unconscious level of the socio-spatial phenomenon.

The meaning of rule structures at the deep unconscious level does not point to a fixed thing hidden somewhere. It rather indicates the existence of a scheme of scientific investigations in general for looking at particular phenomena in a specific way.

Process and structure are the complementary opposite categories where the former indicates the ontological base of entity in the ever-changing world while the latter associates with epistemological concern about the ever-changing world. Socio-spatial process is the ongoing interaction between space and society which produces socially meaningful systems and spatial organisations in the



manifest socio-spatial phenomenon through the dialectical synthesis of inherent opposites. The socio-spatial dialectic is a whole which synthesises the interacting opposites of structure and process in socio-spatial phenomena.

The socio-spatial dialectic implies something going on (events) but not certain determined things and facts. Though no phenomenon can be understood without the basis of a fixed conceptual framework, the phenomena seen through the latter are not fixed objects. The conceptual framework is a tool but not a final thing which lasts forever. Chuang Tzu once said that nets were only to catch fish and after catching fish they were of no use.

The core ideas of the socio-spatial dialectic will guide us through all the arguments in the remaining chapters as a principle by which to look at things but not as immediate pointers to certain facts. How this conceptual framework works in the arguments will be made plain in the next chapter where the interaction between nature and culture is discussed. There, the deepest foundation of both social process and spatial organisation will be found to be the dialectic interaction of the complementary domains of nature and culture.

## CHAPTER 3. NATURE AND CULTURE IN THE SOCIO-SPATIAL DIALECTIC

### 3.0. INTRODUCTION

In the previous chapter, the structure/process dependency of the socio-spatial dialectic was stressed. In the present chapter, we will focus on the interaction between the two domains of nature and culture in the socio-spatial dialectic. This interaction is assumed to be the most fundamental basis of both spatial organisation and social process. To illuminate the meanings of nature and culture applicable to the socio-spatial dialectic, we will review briefly the writings of some authors who have been particularly concerned with the distinction between nature and culture.

Of all the binary distinctions employed by Lévi-Strauss for the analyses of kinship structures and myths, that of nature and culture is the most basic and pervasive throughout his works. An overview of Lévi-Strauss' views on nature and culture enables us to find their proper meaning in the socio-spatial dialectic. Further, an investigation of the views of Lao Tzu, Rousseau, and of some materialists also illuminates the dialectic interaction of nature and culture. Lao Tzu is one of the oldest writers on this subject whose views remain comprehensive and deep. Rousseau is also relevant for, without doubt, it was he who first argued that the division of nature and culture arose out of the increase in man's capacity for reason triggered by his social consciousness. The views of the materialists widen the horizon for an understanding of this subject in another way.

We continue by assuming the threshold distinguishing the two domains of nature and culture in the socio-spatial dialectic to be the principle of least effort. Also, we elaborate on how the principle operates distinctively in the two domains. This takes

us to the point from which spatial organisation and social process can be looked at in their primary states. The discussions of the first two sections of this chapter clear the ground for a conceptualisation of spatial organisation and social process as a single entity.

### 3.1. NATURE AND CULTURE

#### 3.1.1. Lévi-Strauss' Binary Distinctions

Lévi-Strauss adopts a binary mode of thought throughout his study of the mythology of American tribal societies (with the focus on the myth of the Bororo indians of central Brazil) taking his cue from the distinctive binary features of Jakobson's linguistic theory. For the exploration of an outline of syntax in mythology, operating at a deep level, Lévi-Strauss draws three kinds of analogies from music, linguistics, and cybernetics. 'The myth and music share of both being languages which, in their different ways, transcend articulate expression, while at the same time,....., requiring a temporal dimension in which to unfold'.<sup>(1)</sup> Myths are anonymous and have no definite origins. When individuals receive messages from repeated myths, comprehensible rules (meaning systems) should be sought (projected) at the level of unconscious reorganisation beyond the conscious perception of the receiver. Myths cannot be more than conscious approximations of unconscious truths like a musical score, as there exist the inevitable 'irrational relations between the circumstances of the creation of the myth, which are collective, and the particular manner in which it is experienced by the individual'.<sup>(2)</sup> Lévi-Strauss refers to structural similarities between myth and music in the expression that 'the myth and the musical work are like conductors, where the audience becomes the silent performers'.<sup>(3)</sup> Musical works are composed of the two inseparable forms, that of melodies which proceed contiguously and separately for each instrument, and that of harmony which combines the separate scores simultaneously. As a conductor should read musical works both horizontally and vertically,

myths should be interpreted the same way in that they are broken up, rearranged according to relational terms, and superimposed in lines and columns. Lévi-Strauss calls this process of analysis metaphoric, following Jakobson's metonymy/metaphor distinction in which the separate realms of meanings are reintegrated with the totality of the others.

Lévi-Strauss draws similar distinctions from the Saussurean dichotomy of syntagmatic/paradigmatic, this time defining more concrete operational procedures of the analysis. The syntagmatic sequence of the mythemes (the unit meaningful terms of the myth) does not convey any reliable message. Only by dividing the syntagmatic sequences into superposable segments (mythemes) or by superposing a syntagmatic sequence of a myth as a whole on other myths, does the relational structure of transformations reveal the identifiable meaning. Lévi-Strauss refers to the pattern of functions ascribed by each myth as code, and to the subject matter of each as message.<sup>(4)</sup> The grammatical constituent (structure) of codes is invariant for all myths but the messages undergo transformations. To decode the undistorted message at the deep level, we must find out the transformation structures of the mythemes as they are exemplified in the notion of metaphoric or paradigmatic transformations.

Lévi-Strauss showed in 'Mythologiques' how the distorted messages of social phenomena at the conscious level can be reorganised in a meaning system at the unconscious level by rebuilding the relational structure of transformations through metaphoric and paradigmatic analysis. In so doing, he treats all the mythemes within the binary distinctions of terms with symmetric polarity. We do not know if our brain is conditioned physiologically to function like a digital computer. The binary mode of thought with its notion of polarity and dialectics seems to be rooted in the wider principles of cosmology beyond the inner functions of our brain such as is explained in cybernetics. This moulded one way of our thought since ancient times, from

Yin-Yang dialectics in China and the logic of the excluded middle in Greece, and then to Hegelian dialectics, Boolean algebra, and the computer theories of modern times.

Among all the polarities introduced in 'Mythologiques', the opposition of nature and culture is prima facie the most basic and comprehensive one which rules all the others. Fire and cooking are the basic symbols by which culture is distinguished from nature. Men distinguished themselves from other species by the fact that they transform raw material(nature) into artificial entity(culture) with the mediation of heat. The titles of Lévi-Strauss' works, 'Le Cru et le Cuit' and 'Du Miel aux Cendres', well imply this fact.<sup>(5)</sup> When we cook, we transform a raw material to an edible one by using fire. We use fire to drive away bees, to separate the honey from natural state and to convert tobacco into smoke.

One of the basic ideas upon which Lévi-Strauss' structural anthropology rests, is the concept of the passage from nature to culture in human collective life. This central theme pervades all his works from kinship structures to mythologies. The study of the life of the people who live in the marginal region between nature and civilisation disclosed to him a perspective on the superficially ambiguous demarcation between nature and culture. In his 'The Savage Mind', Lévi-Strauss saw the apprehension of man of the specific character of the animal and vegetable world as the first source of logical operations, and subsequently of social differentiation. The same idea continues in the definition of totemism as a logical system which connects the 'relation of man to nature' and the 'characterization of social groups' by means of a recourse to animal and vegetable terms.<sup>(6)</sup> As he argues strongly, the names of the animal and vegetable world classified by so-called 'primitive' man is not a mere taxonomy of things worked out by the pre-logical mind but a logical system of representation employing the mode of thought which the animal and vegetable world suggests. For the analysis of totemism, Lévi-Strauss breaks down the empirical phenomena under study into elementary relations between terms and

constructs a meaning system from the analysis of the possible permutations of these relations. The elementary relations consist of the two series of nature and culture, and each series comprises two modes of existence, one collective, the other individual. The relation between man and totem is metaphoric and the genuine totemic sphere is constituted of a collective relationship between groups of society and species of the animal or vegetable world.

In the 'Elementary Structures of Kinship', the same theme, the passage from nature to culture, enters at the centre of the theory. Here, Lévi-Strauss sees the incest taboo as a unique social institution enforced universally in every social group, which mediates the transition from nature to culture. The problem of the incest taboo originates from the fact that man's nature belongs to both domains, nature and culture. 'Man is both a biological being and a social individual. Among his responses to external and internal stimuli, some are wholly dependent upon his nature, others upon his social environment'.<sup>(7)</sup> His sphere of behavior reveals one source of cultural origin and one biological and natural, or an integration of both. Then what is the most distinctive phenomenon which draws the line between the nature of the animal world and the culture of human society? Lévi-Strauss regards the prohibition of incest as the bridge between these two opposite modes of human existence even though the diversity of the application of this rule among certain societies and primate animals causes some ambiguity. According to Lévi-Strauss, universality is the criterion of nature because the constants in the human world exist beyond man's differentiated conventions. 'Everything universal in man relates to the natural order, and is characterized by spontaneity, and that every thing subject to a norm is cultural and is both relative and particular'.<sup>(8)</sup> The incest taboo belongs to both domains in that it constitutes one of the basic social rules and at the same time possesses a universal character. It is the link where the transition from nature to culture takes place.

### 3.1.2. Nature and Culture in Lao Tzu, Rousseau, and the Materialists' Views

As far as the main theme of Rousseau's works rests on rebuking the eighteenth century belief in the perfection of man's progress through rational and scientific pursuit,<sup>(9)</sup> this reminds us of the teachings of Lao Tau. Both of them preach, in different languages but in a similar tone, a return to nature, the root of man, to be free from the intoxication of the pursuit of rational knowledge and from the corruption of man caused by the introduction of social conventions into collective life. Man in his original state of nature, according to Rousseau, is free, equal and individually self-sufficient. Natural man has only two faculties of self-love, which Rousseau calls 'Amour de soi', and 'a principle of pity'. He is distinguished from the animals by possessing the free will to choose among his natural impulses and the capacity to develop himself. He lives only in the present, governed by limited physical needs and directed by the instincts of 'Amour de soi' and pity. Natural men are free beings of independence and self-sufficiency with no sense of property or of justice. They are all equal because their life is directed by 'Amour de soi', the form of self-love in which the well-being of the self does not depend on comparisons with others but depends only on itself.

But with the emergence of society and so of social man, the form of self-love is transformed to 'Amour propre' in which the well-being of self depends on the stance in relation to others.<sup>(10)</sup> This change took place when, with the demographic explosion, men developed different modes of living fitted to the locality of a settled place, new tools and skills, eventually developing language and settling in families. They began to realize their relations with others and to cooperate with each other. When relations between neighbouring families were established through constant communications between them, individuals began to acquire a special identity and preference for each other. The transformation of natural man to social man brings forth the change of private identity to public identity which

is created by public opinion. Men began to desire to be valued by others, and so live in others' opinions, with a concern to be distinguished as superior. This transformed form of self-love, 'Amour-propre', is the foundation of social man's progressive corruption, creating the competitive and vicious elements in human relations. The making of comparisons between oneself and others gives rise to the radical break between nature and society, and between natural and social consciousness. Rousseau's theory is not a historical conjecture of the evolutionary transformation of man from the original state of nature to the corrupt social man. The state of nature no longer exists, perhaps never existed, and probably will never exist. Rousseau's enquiry aims at finding the character of the pre-social condition of man, in which inequality and corruption are absent.

For Rousseau, nature simply connotes the pre-social state of man. He tries to trace back the forgotten path from man's original state of nature to the state of society. In the way of discovering the lost innocence of man's nature, Rousseau attempts to seek the clue to the entangled problems of society. As man in the state of nature is only directed by the concern for self-preservation, his desire is limited to immediate physical needs for food, a female, and sleep and his only fears are hunger and pain.<sup>(11)</sup> As far as the pre-social man is not dominated by passions, he is not wicked but wild. According to Rousseau, passion is the prime mover for the development of reasoning in man, for man desires knowledges only because he wishes to enjoy. So, the passions which emerged out of pre-social man's wants progress hand in hand with an increased capacity of reasoning, and accordingly of knowledge. In the state of nature, the differences between men remain minimal ; it is cultural conventions that enhance inequalities among men. For natural men, reciprocal obligations are negligible insofar as mutual dependences are minimal. The social bond of servitude enters into the human scene when man begins to be conscious of others and to compare himself with others, giving birth to the desire for



new wants, while the activity of the passions in man gives way to the explosion of reasoning.<sup>(12)</sup>

Rousseau contests Hobbes' idea that men are prone to evil because of a weakness in reasoning and are destined to be wicked and hostile to their fellow creatures ~~since~~ man's original nature lacks in virtues and goodness.<sup>(13)</sup> Rousseau goes so far as to say that man's egoism is moderated by the instinct of self-preservation, as he feels a compassion when facing ~~and~~ suffering fellow-creatures, in reflection of his own state of suffering. While Hobbes regards the uncultivated core of man, man's state of nature, as the root of evil in society, Rousseau discovers the origin of evil in the cultured essences of a man. Both take the same line of thought only with inversion in disregarding that nature and culture are complementary opposites interacting to constitute the state of man's existence in the world. Following Rousseau, the social man lives outside himself in consciousness of others while the natural man lives within himself in consciousness only of himself. Rousseau seems to imply that nature is something internal existing in man whereas culture is that imposed from without. This gives a picture of man's existence as a boundary which is always changing but is in an equilibrium at any time between the centrifugal forces of nature within man thrusting outwards and the centripetal forces of culture imposing pressures from outside.

Lao Tzu's pronouncements do not deviate much from Rousseau's arguments in that Lao Tzu also repudiates explicitly or implicitly all the evils germinating from human reasoning, chapter by chapter in Tao Te Ching.<sup>(14)</sup> Tao denotes 'the way' but its principal connotation in Lao Tzu's text seems to be the way in which nature exists and operates. The Chinese equivalent term for nature, (自然), conveys the meaning of an entity (being, principle) which exists and operates without being caused by any other being's intentions or designs. In this respect, some aspects of man may be categorised as the domain of nature. Whereas Rousseau stresses the recovering of the lost innocence of nature in the unacculturated

man, the metaphoric language of Tao Te Ching warns of the harmfulness of an imbalanced inclination towards cultural conventions in man's individual and collective life. Here, the way of nature, Tao, implies the principle of harmony between the interacting complementary entities such as maleness and femaleness, soft and firm, weak and strong, high and low, change and lasting, being and non-being, infant and old, skilledness and non-skilledness, knowing and not-knowing, doing and not-doing, increase and decrease, and so on. As far as we follow the principle these metaphors suggest, it would seem that nature and culture also are complementary opposites interacting to become a whole in Tao.

In Lao Tzu, everything as it is for itself is natural and there manifests Tao. Whenever the way of nature, Tao, is absent, it is artificial and this artificiality comes from human reasoning as it prevails in cultural conventions. Chuang Tzu put the distinction between nature and culture into another metaphor : 'What is heavenly is internal ; what is human is external. .... Oxen and horses have four feet ; — that is what I call their heavenly(constitution). When horses' heads are haltered, and the noses of oxen are pierced, that is what I call(the doing of) man'.<sup>(15)</sup> In this view, the heavenly implies the way of nature while what is of man's doing points the domain of culture. Here, nature comes to mean an internal origin or root of every entity whereas culture refers to the additions of man's design to what is of nature.

In contrast to the views of Lao Tzu and Rousseau whereby nature is regarded as an entity untouched by human conscious reasoning, in the materialists' view, nature is the undifferentiated external thing.<sup>(16)</sup> Here, even man is regarded as a natural thing so far as man is reckoned to be living only through reflecting himself in the sensuous material objects. According to this view, man appropriates nature through the medium of his labour to produce objects. Social relations and natural things mediate each other as these are involved in the creation of use-values through labour. The materialists' view of the relation between nature and man is

crystalised in Marx's concept of metabolism.<sup>(17)</sup> Within this concept, man can only alter forms of material by following the process of natural forces but cannot create a new thing(material) in the appropriation of nature. In this metabolic interaction, nature is humanised while men are naturalised. Labour-power is 'material of nature transformed to a human organisation'.<sup>(18)</sup> Nature is transformed through this humanised nature(Labour-power) as the latter appropriates the materials of nature which exist outside man. Natural things are transformed into objects of use-values through the metabolic interaction and acquire the corresponding social quality. In this way, society and nature mediate one another.

Lukács defines labour as an ontological category because he thinks that man realises his goals in the materials when he effects the change of forms in the materials of nature.<sup>(19)</sup> Man's interaction with nature is distinguished from that of other animals in the labour by which man alone posits his goals and means, giving rise to a self-governing consciousness. Here, labour represents a leap from nature to social being. In this view, teleologically oriented labour severed man from his environment(nature) and germinated the confrontation of subject and object in the form of 'being and its reflection in consciousness'.<sup>(20)</sup> The subject-object relation creates the distancing of objects from the subject. Lukács explains this distancing by referring to language as the object for social communication whereby what is depicted by verbal signs is separated from the objects these describe and also the uttering subjects insofar as each sign can well refer to quite different unintended contexts.<sup>(21)</sup> With the rise of consciousness, labour takes its root on the firm basis of the teleological goal and now consciousness controls the biological being of man, making the natural boundaries retreat.<sup>(22)</sup> But, after all, this boundary cannot be extinguished for even the conscious social man cannot remain alive without the biological reproduction of his body(the natural material).

### 3.1.3. Nature and Culture in the Socio-Spatial Dialectic

In the socio-spatial dialectic, nature comes to mean space as it is in the state of the undefined and the undifferentiated. Once space in the state of nature becomes differentiated and defined through the operation of human intentions, it ceases to be a mere physical thing to be transformed to a cultural object carrying a certain quality defined by cultural ideologies. In the domain of cultural objects, each species of space organisation contains social processes as far as cultural ideologies are products of the collective life of a community. The space in the state of nature is transformed into the socio-spatial entity(see 3.3.) in the cultural domain through the process of the socio-spatial dialectic. For Rousseau, the transformation of man from the natural state to social man is an irreversible process. Social man cannot return to his original state and cannot be again the perfect self-sufficient being. But in the conceptual framework of our socio-spatial study, the attributes of nature and culture inhere together in the condition of human existence from the beginning and this condition will not cease. Though man managed to humanize his natural attributes by his cultural conventions, the basic facts of man's existence as a part of nature cannot be extinguished.

In the state of nature, man provides his shelter only to fulfil his instinct of self-preservation and as a result his building activity is guided exclusively by physical needs. Even if there are different aspects between his environment and that of others, natural man cannot see it because he is governed by 'Amour de soi'. As natural man is wholly self-sufficient for himself, he has no way of making comparisons. For him, both other beings and their habitat are together a part of nature. As far as he is conscious only of himself in the natural world, he does not exist in another's consciousness and never possesses any idea of property. His shelter is merely a product of immediate responses to the requirements of 'Amour de soi'. There can never be any meaningful relations between his shelter and others. Thus there is no room

for socio-spatial theory in man's pre-social natural state. If we merely follow Rousseau's line of thought in socio-spatial study, the artificial environment will become the material evidence of inequality and corruption in society. It will become a frozen 'Amour propre' of social man. But we do not see the collective life as an inevitable vice and the foundation of injustice. We believe that society is not only a reality constituting collective life but also an abstract name given to the way in which individual and collective representations interact with each other, to form a harmonious whole. Whereas Rousseau tried to set a model for a new moral man, by which social man, biased by corrupt and inequality-bound social conventions, could direct his life, the socio-spatial study is concerned with how the artificial environment is created as a manifest representation of the interaction of individual and collective forces in society.

When man creates an artificial environment, he transforms a part of nature into an inhabitable space(cultural objects) through the operation of his intentions. Man's touch, like the breath of life, transforms inanimate substance into a meaningful extension of himself. As is clear in the example of bee-hives, an animal's habitat remains in the domain of nature, however sophisticated it may be. On the other hand, however dull it may appear to be, man's habitat is contained in a cultural domain. Whereas the animal's habitat is the end result of physical(natural) forces which are devoid of any conscious intentions of its makers, human intentions (cultural ideology) direct the constituent forces to a goal. Even in the state of nature where, as Rousseau suggests, man is distinguished from animals because man is conscious of himself among the world of nature and directs his own instincts with his own free will, the habitat built by man could be distinguished from the animal's, though it still attained no relational terms of the kind necessary for a culture to exist. Here, the medium which divides and connects the two domains of nature and culture is the principle of least effort(see 3.2.).

The transformed part of nature, the artificial environment, cannot be said to be totally shifted to the domain of culture. It would more be appropriate to put it this way : that a part of nature is humanized or culturalized up to the degree that human intentions are fed into the process. So the artificial environment is not contained exclusively in the domain of culture but still maintains the attributes of nature. The fact that once created, cultural objects have their own autonomous domain beyond human intentions also implies that cultural objects belong to both domains of culture and nature. Only the cultural intervention of man through the common link of the minimum-energy principle bridges the two domains of nature and culture in the creation of the artificial environment.

Seyyed Hossein Nasr, in his book 'The Encounter of Man and Nature', holds to the view that the main problems facing modern industrialised and urbanised societies stem from man's domination over nature fomented by the materialistic conception of nature.<sup>(23)</sup> Modern man's exploitation of nature turned away the wisdom with which other species and nature itself operate in harmony. Infact, the idea that nature as a material thing can be exploited, manipulated and consumed limitlessly for the fulfilment of man's wants by conscious design seems to pervade all the societies from West to East regardless of their professed political denominations or cultural ideologies. As the writings of Lao Tzu and Rousseau suggest, this phenomenon is not confined to modern societies or western industrialised societies. It must be a special case of disequilibrium of the continuous process of interaction between nature and culture as the primordial condition for man's existence in the world. Only from the point of observation limited in space and time, we may postulate that societies of a certain period or those of a particular culture live more in tune with nature than others. Socio-spatial phenomena come from the continuous process of dialectical interaction between nature and culture. What matters in this process is how well a society accomodates the part

of nature which it transforms into cultural objects, within their cultural potentials.

Nasr wants to restore the spiritual quality of nature for man to regain harmonious equilibrium with it. Only by this can man reach the inner depth of his own being. He epitomises the old theme of Lao Tzu and Rousseau in a fresh light, namely, that the two domains of nature and culture (in every entity) must be in tune with each other. 'Man sees in nature what he is himself and penetrates into the inner meaning of nature only on the condition of being able to delve into the inner depth of his own being and to cease to lie merely on the periphery of his being'.<sup>(24)</sup>

When space as a part of nature is transformed into cultural objects through the operation of human intentions, the natural cause (materialism, utilitarianism, functionalism) and the cultural potential must not be allowed to overwhelm the other. The natural cause here does not refer to 'the way of nature' as such but to the motive for the maximum physical gains with minimum energy expenditure in its broad sense. If the cultural potential is overloaded with the natural cause, the people of a community could not accommodate space as cultural objects within their cultural potential. As a result, people will be alienated from their environment. In contrast, if the cultural potential (cultural ideologies) is over-stressed in the transformation process (nature culture interaction), the equilibrium will be breached the other way round. The realm of human reasoning encroaches upon the autonomous domain of nature. In the former case, nature is over-exploited and cultural potential is under-manipulated whereas in the latter, nature is under-exploited and cultural potential is over manipulated. Both cases cause disharmony between the human world and nature to a similar degree but in opposite directions.

Except for Lévi-Strauss, all the views we discussed in section 3.1., reflect ideological stances from which value judgments are made on the phenomenon of society. We are not certain whether ideological orientations can be totally excluded

from any kind of scientific investigation, but in the conceptual framework of the socio-spatial dialectic, ideological arguments on the interaction between nature and culture are secondary. The main concern is with how the interaction of the two domains adds up to the socio-spatial phenomenon.

Lévi-Strauss, Rousseau, and Lao Tzu seem to be at least non-materialists though not idealists. All of the three authors appear to imply that man's world belongs to both domains of nature and culture and these two domains are the two complementary but opposite facets of every phenomenon. In accord with this, we are led to the idea that the basis of the socio-spatial phenomenon is the transformation of space in the state of nature into cultural objects while social men differentiate space through the use of their cultural ideologies. Though materialists' views are rather extreme towards one direction in regarding nature as simply raw material things and nothing else, and likewise in regarding culture as the relations of transformed material things, their point of view reminds us of an often neglected aspect of reality ; that is how our world is bound up with its material aspect as much it is based on non-material aspects.

### 3.2. THE PRINCIPLE OF LEAST EFFORT IN NATURE AND CULTURE

While nature blindly follows the urge of the minimum-energy principle, men modify the natural course according to their interpretations of the principle in creating the artificial environment. Natural man feeds only physical necessities into the process of building his habitat with immediate response to the instinct of self-preservation. But, social man chooses the most favourable course among the probable alternatives by reflection upon past experiences and the expectation of future results. Moreover, men of one society have different views from those of other societies on the way in which they interpret the principle. The cultural ideology of a community, which is collective and external, influences the ways the principle is interpreted, though



how it is put into practice depends on individuals. The two characters, the trend to follow the natural course and the other to modify it through the intervention of cultural potentials, are complementary aspects of the same process in the socio-spatial dialectic.

Any species will lose its chance of survival in the course of natural selection, if it cannot coordinate external and internal forces in an energy-economic way. Internal forces are the internal properties in any particular structural system. External forces are the governing influences, mainly environmental, which are thrust from outside upon any particular structural system. The 'principle of least effort'<sup>(25)</sup> suggests one of the most basic rules governing human behaviour in this respect. It implies that a person in solving his problems strives to minimise the 'probable average rate of his work-expenditure' over time. In so doing he will minimise his effort. It is reckoned that man tries to capitalise, in a most economic way, all his available resources, whether it be material means, knowledge, technology, managerial skills, or state and power in the society, for the creation of a desirable habitat. In nature, this principle works in a direct and objective way, achieving its goal with maximum efficiency by investing only its minimum potential energy in exclusively physical terms. But man modifies the seemingly natural course of action, which guarantees the maximum physical gains at the expenditure of minimum energy, through the projection of his cultural potentials in interaction with environment. The values attached to the principle and the way in which it is applied in real life vary from society to society according to their cultural ideologies. A certain mode of choice among the probable courses, which is regarded as a most economic option to achieve a goal in a culture, could be a less effective alternative in another culture. The particular way in which the principle manifests in a culture is synchronised in the behaviour of the people in an unconscious manner. If we take a simple and explicit example, among surveyed villages (see section 6.1.), the orientation of main buildings is made to face south for

the maximum exposure to sun in certain villages while, in others, it obeys strictly the rules of feng-sui.

In various fields, this concept is adopted as a guiding principle. It has long been established in various fields of physics, prototypically developed in mechanics, as the principle of least action, or the principle of maximum and minimum, or the principle of unique determination.<sup>(26)</sup> Haggett et al. resort to the concept of 'least movement' as an explanatory model for population distributions and their spatial interactions.<sup>(27)</sup> Lösch, in economic geography, employs an analogy of the physical laws by which the refracted light and sound follow the shortest route, to explain how transport lines are to be determined in a most economic way.<sup>(28)</sup>

The problem of visual perception was also investigated in gestalt psychology using this principle. In the process of visual perception, the articulation of the visual field demands a minimum of energy capable of organising visual information. It means that the physiological mechanism works in such a way as to minimise the expenditure of its energy or its total effort. Good shapes or ordered patterns are regarded as the ones which cost the perceptual mechanism less effort.<sup>(29)</sup> In psychological process of perception, the characteristic aspects of physiological process are supposed to be isomorphic to those of the corresponding conscious processes.<sup>(30)</sup> The stimulation of the eye, as when we see irregular spots, produces definite spatial relations in the ensuing distribution of their images. There is a tendency to impress on this distribution process itself and to constrain the stress between the distribution and the stimulus pattern towards simplification. If we consider visual perception as an information-handling process,<sup>(31)</sup> the major function of the perceptual mechanism is to sieve out the redundant stimulation so as to encode the incoming information in a more economical form than that which is received by the receptors. When some portion of the visual field contains excess information over the observer's

perceptual capacity, he tends to average out particulars and abstract certain statistical homogeneities to reach a simplified organisation.

It is a well known fact that the patterns and forms found in nature represent the manifestation of this principle as can be seen in such examples as the close packing of cells, surface tension of soap bubbles, cracking of mud, branching of rivers, trees, and blood vessels, crystal structures as in crystals and snowflakes, or ripples in sand and the markings of zebra and giraffes.<sup>(32)</sup> All the forms and patterns in nature, whether organic or inorganic, come into being through a morphological process in which the constituent elements organise themselves in a configuration of minimum energy and find equilibrium. In inorganic nature, such as a crystal, the organisation is so dominated by physico-geometric constraints that the resulting form has a definite limit to its complexity as well as regarding its relationship with the environment.<sup>(33)</sup> But in organic organisations, the morphological process depends on bio-chemical interactions, creating a radically new complex with greater possibilities of interaction with environment.

The structural systems in nature which follow the conditions of minimum potential energy, might be fed into a design strategy for the artificial environment.<sup>(34)</sup> But the final structure of the artificial environment so created not only relies on the way in which the principle operates in nature but also the way people interpret and adopt it, because in the domain of culture the principle of minimum energy works in a different way from in nature.

Man-made objects such as works of art, buildings and settlements, are often compared to organic nature.<sup>(35)</sup> This analogy comes from the supposition that the same morphological laws of organic nature govern the organisation process of man-made objects. In this view, the morphology of man-made objects undergoes the same changing process as in organic nature, of development, growth and decay,

balancing out all the internal forces and absorbing and equilibrating external constraints. Analogy is surely an effective method of illustration and of indirect verification, but it always retains a distance from reality for the explanation of phenomena. For the organic analogy in design, the gap is caused by the fact that cultural factors do not operate in the same way as 'the principle' in nature.

The theme that morphology is not only the study of the forms of material things but also its dynamical aspects under which all the forms created by nature are interpreted as 'a diagram of forces' is pervasive throughout D'Arcy Thompson's work, *On Growth and Form*. The guiding rules, which lead the push and pull of interacting forces to equilibrium, are the requirements of minimum energy. An outstanding example, which shows how the morphological process in nature operates differently from that of cultural domain, is the beehive.<sup>(36)</sup> The comb is shown as perfect in economising labour and wax. The beauty of the honeycomb, which secures maximum space out of the economy of resources and labour, is not an intended result. This is due to the automatic play of physical forces which produce equal pressures while each bee strives to make its own little circle as large as possible. One of the factors is the property of material which brings the whole system into equilibrium under the symmetrical tensions in the semi-fluid film state.

Nature's response to the requirement of minimum energy is immediate and exclusively physical. But, when a person tries to solve his problems in order to minimise his total work, he considers the probable future routes of the problem as well as the immediate one, reflecting upon past experiences and available information. He strives to minimise the 'probable average rate of his work-expenditure over time'<sup>(37)</sup>; but it never stops there. He lives in a social milieu. The cultural ideology, which the society accomodates, imposes on him a particular interpretation of what is the most economic way to solve the problem. These interpretations are different from society to society. The trend that more

societies come to share similar or common interpretations does not mean that the principle of minimum energy can be applied universally to every culture as it works in nature, but simply indicates that more societies have come to share more homogeneous cultural characters with the growing opportunities for interaction and communication between distant societies.

The functionalism of the machine age, <sup>(38)</sup> which bred the international style can be seen as an ideology which made a generation of architects and planners commit themselves whole-heartedly to the univalent cause of the minimum-energy principle. Buildings were seen as living organisms which self-regulate their energy requirements in response to constraints from the outside environment. The widespread and successful mechanical inventions were as well regarded to be the embodiment of essential functions of organism. Then it became in turn a virtue to adopt that mechanism in architectural practices, which was supposed to operate as efficiently in man-made objects as in nature. This machine-theoretic utilitarian trend evoked the rise of the vernacular movement and later the semiotic interpretation of architecture, <sup>(39)</sup> which attempted to re-evaluate ignored factors such as conventions, the locality, and the meaning systems attached to artificial environment. These can be seen as an attempt to recover a lost cultural leverage against the modernism which overvalued the economic mechanism of nature and made it the exclusive function of architecture. The latest 'post-modern classicism', <sup>(40)</sup> which Charles Jencks labelled and hoped will not be the recurrence of conventional style in a time of retrenchment, is another counter blow to an exclusive naturalism with the same end as the vernacular movement and the semiotic interpretation of architecture. It tries to reconnect the link between architectural expression and the past and conventions.

When we live as a member of a society, it costs us a greater or lesser degree of individual freedom. While we can only maintain our identity within a culture, it imposes upon us a particular mode

of life. The benefits of being a member of a society are provided in return for certain constraints lodged in individual life. In the domain of culture, the principle of least effort manifests itself in the dialectic interaction between individual and collective representations. Zipf's idea of 'the forces of unification and diversification'<sup>(41)</sup> identifies one aspect of the interaction between individual and collective representations. For him, in speech, a speaker's economy is in possessing a vocabulary of one word which refers to as many distinctive meanings as possible. For the opposing auditor, the economy is achieved by possessing a vocabulary of as many as different words with one distinctive meaning for each word. So the speaker's economy tends to unify all meanings to a word, while the auditor's economy tends to increase the vocabulary. In our version of individual and collective representations, this idea comes around the other way. As semiologists define it, if we consider culture as a complex of various sign systems or a kind of language, we can find a comprehensive application of this idea which refers to the whole of culture. For the various forms of communication in a culture, every individual wants to command an unbounded vocabulary with maximum expression of individual flavour. But in collective social life, the maximum freedom for the diversification of individual expression will cost too much for individuals to communicate to each other. In its extreme, it will threaten the stability of culture itself. There needs to be a contract between the members of a society to have a common rule which restrains to a degree their individual representations. Once the regulated passages for mutual communication are provided, more or less unified models of communication will save the effort for every individual as well as of the society as a whole at the expense of the variety of individual representations. In that the collective representation is an abstract identity and individual representations are real,<sup>(42)</sup> the helm is in the hands of individuals to steer a way to mould the culture. In every form of communication in a culture, the dialectic interaction of these two complementary forces gives birth to cultural objects. Collective representation is generated from

the force of unification, whereas individual representation is based on diversification. The interaction between individual representation and collective representation is, we believe, based on the more far-reaching general relational structures which we might call the logic of parts and wholes in the socio-spatial dialectic, which we will discuss in the next chapter.

As far as the socio-spatial dialectic is concerned, the separate explanations of the principle of least effort in the domains of nature and culture are temporary and artificial. As much as the interaction of the two domains is the foundation of the socio-spatial phenomenon, the socio-spatial dialectic is manifested in the way people modify the constraints imposed by the principle operating in the domain of nature to secure the organisation of space which reflects most effectively their social values with the least expenditure of resources at hand. The operation of the principle at the physical level of spatial organisation, especially in the domain of nature, that is before the intervention of cultural ideologies, will be elaborated in chapters 7 and 8 when dealing with concrete examples. There the role of the principle in the socio-spatial dialectic in mediating the two domains of nature and culture will gain a clearer meaning.

After reaching a conclusion that the minimum-energy principle is the threshold connecting as well as dividing the two domains of nature and culture in the socio-spatial dialectic, the question remains of why this principle is chosen rather than any others. The answer is dormant in the arguments of this section. When social man transforms his environment into a domain of order, he cannot but mobilise his resources in their widest sense in the most economic way. Otherwise, his building activities would be directionless because there would be no guideline as to the use of available resources. No society could maintain its stability with a directionless investment of energy and resources. Only the interpretation of what is in fact the most energy-economic way will be different from one society to another according to their cultural

ideologies. These interpretations could not be other than relative between interacting societies. Social man is not totally cut off from his origin, that is nature, not in an evolutionary sense but as the complementary pole of culture. Man's body and all its related functions follow the same laws as operate in nature. Cultural conventions are applied to modify and accomodate the constraints imposed by the minimum-energy principle.

As we have already argued in this section, the principle is manifested at every level of phenomena in the domain of nature and we may say that this principle is universal. It seems to be a teleological goal of every conscious and unconscious being in the universe. Insofar as nature and culture are two poles in the socio-spatial dialectic the principle manifests in both domains ; though in the domain of culture it is modified by social values.

### 3.3. THE SOCIO-SPATIAL ENTITY

The amorphous space surrounding natural man takes shape through the operation of human intentions. By natural man, we do not refer to the state of man in the pre-social era. We mean by it rather metaphorically the complementary opposite pole to that of the domain of culture in man. The transformation of space from the state of nature to cultural objects is of more than physical necessities. Man's intentions reflect the search for his cosmological and ontological references. Eliade examines the archetypal meaning of human habitation in the creation of the centre of the world by religious man in traditional societies.<sup>(43)</sup> For them the acts of settling in a territory and building a dwelling are equivalent to founding a world. The inhabited territory is assumed to be the world of order(cosmos) beyond which the foreign world of demons and the dead extends amidst darkness. The founded world is the ordered sacred space surrounded by unknown chaotic profane space. This differentiation of space gives birth to a fixed point, from which man can orientate himself, and in which he finds his abode in a real and effective life in the world. The



creation of the centre of the world in the midst of the limitless homogeneity and relativity of profane space is the existential choice in resolving man's thirst for being.

Bollnow attributes a basic ontological meaning introspectively to human habitation as an experienced space.<sup>(44)</sup> Man cannot live in the world as it is. He needs a relational point for his life from which all the ways stretch out to the full width of the world, and where he starts his life and returns in the end. So his houses as well as his living environment are the extensions of man's existence in the world. These are the centres of the world where man feels at home. This is the territory of neighbourliness and trustfulness in the midst of the remoteness of the world. In traditional societies, men struck the roots of their life into this centre of the world with total concrete relations. The house is the centre of the world in that this is the point where man takes root in the earth, and on the basis of this relational point he starts to construct his life and eventually returns to it. Whether the centre refers to the sacred space or a relational point of the life space, it comes to mean space as a domain of culture transformed from the state of nature.

Man breaks the homogeneity of nature to provide the differentiated domain of order. This is the locus which opens him up to the other parts of the world or to another cosmic plane. Man cannot exist in the world without that relational point ; that is, without a differentiated domain of his own. He builds not merely to inhabit or to take a shelter but to dwell. Dwelling comes to mean living somewhere with a root deep into the concrete relational point. Heidegger expounds the ontological meanings of building and dwelling from their etymological considerations.<sup>(45)</sup> The act of building, the provision of differentiated domain in the midst of the homogeneity of nature, is considered to belong to dwelling. At the same time when a differentiated domain is created by the act of building in the midst of the homogeneity of nature, there a location comes into existence. 'A space is

something that has been made room for, something that is cleared and free, namely within a boundary'.<sup>(46)</sup> Space is that within which boundary the differentiation from the state of nature has been taken place, giving birth to a location. Location lets a space come into being as a reference point where people dwell. Space and man's existence in the world together come to imply the existence of an entity which embraces both categories inseparably. The statement that man exists in the world amounts to saying that he persists somewhere among 'things'. Man dwells in a space by the medium of its location wherein he positions himself. Location produced by the act of building secures man his dwelling. The differentiation of space from the homogeneous state of nature is the act of building through which man secures a location, that is a concrete reference point in the world, where he dwells.

Man dwells among things and locations but not alone. Once emerged from the state of nature, social man lives among other selves as a person. He exists both as an independent individual and a member of the collective body, that is society. When man was totally dictated by the instincts of self-love in the state of nature, his building activity could not be attributed to the differentiation of space from a part of nature into a domain of order. The natural man's habitat is the product of the struggle for self-preservation governed only by physical needs. As far as the natural man is conscious only for himself in nature, for him, other beings and their habitats, as well as, his remain a part of nature. In the pre-social man's world, things and spaces do not exist as locations in its true meaning. Things and spaces are there as a part of nature. The change of their locus does not make any difference for him. Until his building activity bestow things with locations so as to give an identity to a space, pre-social man cannot but keep alive without dwelling. Only with the arrival of social man, man begins to dwell. From now on man acquires his individual identity. So other beings exist in his consciousness and he also enters into other selves' consciousness with individual identity. It means that individuals now dwell

through their identical locations both among things and people of a society. Individuals exist through the medium of the locations with self-identity in the physical and social spaces. This location is not a fixed absolute point determined by a measurable distances. It exists among those of other individuals in a certain relation with them, which in its turn is always in the process of change.

The relational structure of location, in this context, is regulated by the interaction between the forces active in man. On the one hand, man yearns to remain as free, self-sufficient, and independent being<sup>(47)</sup> as he has been in the state of nature. On the other hand, as a social man, he has to accomodate cultural ideologies imposed on him from without. From the beginning man is a social being for every individual is given birth in an already existing society. He faces the preformed cultural milieu to which he accomodates and adds his adaptive modifications. He is expected to be in tune with the cultural ideologies of the society to which he belongs because of his being a member of it and of being given an individual location accordingly. Within the same man, the self as a part of nature and the one as a member of a society interact because he is at the same time a part of nature and a social man. This fundamental of human nature is the essence on which the socio-spatial dialectic operates between the individual(part) and collective representations(whole).

Organic analogies have been employed in the explanation of artificial environment with the justification that any kind of space created by man cannot be explained by the sum of its functional units. The basic concepts of the organic view stem from the natural philosophy of Aristotle, in which the property of wholeness is regarded to be such that all the parts contribute to the purpose of whole, and no part can be removed without affecting the whole.<sup>(48)</sup> So, in the living organism, the functions of the parts have no meaning outside their serving to the purpose of the whole. And the existence of the whole depends on the all parts working

together towards the same goal. The organic philosophy of Aristotle is teleological in the sense that all the parts should be subservient to the purpose of the whole. Surely the artificial environment is distinguished from the inorganic structure of a repetitive accumulation of discrete units whereas even though spatial organisation has a certain degree of autonomy in its morphogenesis beyond human intention, its order is still entailed by the cultural ideologies of the maker. It cannot be identified with the organismic world of self-regulation in the sense that human cultural intervention causes the process of spatial organisation to deviate from the 'natural course'. It could be true only as an analogy if cultural phenomena had the ~~same~~ self-regulating mechanism as in the organic world.

In Whitehead's organic philosophy, the actual entities as part of the universe of discourse are internally related through their process of coming to be a whole. The parts are 'actual occasions' the nexus of which constitutes an event in a determinate inter-relation. An event is a whole realised in the process of an actual entity's coming into being where the 'actual occasions' house the world in 'one unit of complex feeling' as a monadic entity.<sup>(49)</sup> Every species of spatial organisation in the artificial environment becomes a unitary whole whereas its component parts are ordered with a determinate inter-relation in an 'extensive quantum'. In a way, our experience or understanding of spatial organisation can be understood as an event where the unit 'actual occasions' as partial limiting experience of actual entity of spatial organisation inter-relate as a nexus in the process of coming to be a whole (a unitary experience as an event of wholeness in spatial organisation).

In the process of socio-spatial dialectic, spatial organisation and social process are intermeshed to become an actual entity as a unitary event of wholeness which we may call a socio-spatial entity. In the state of nature, a group of people remains ~~as a~~ an aggregation of independent individuals without determinate

relations among them to become a unitary whole. Once emerged from the state of nature, individuals become inter-related in a certain determinate fashion forming a whole, that is here a society. From the point of view that parts are inter-related in a certain way to become a whole, wholeness always contains the character of oneness. From this moment, the spaces which individuals occupy cease to be neutral points interchangeable without damaging the wholeness of their nexus. They become locations where individuals dwell and attain certain determinate inter-relations among them to become a whole, giving birth to the socio-spatial entity. Once socio-spatial entity comes into being, it is paramount to investigate how the part-whole relations operate in the continuum composed of space and society through the process of socio-spatial dialectic.

The socio-spatial entity is neither a tangible thing nor an abstract idea but the real entity(actual events) happening all the time in life space. Once emerged through the interaction between nature and culture, both man's social relations and his living space are identified in a determinate inter-relation in the nexus of part/whole relations. In this respect, space and society are inter-related by the part/whole relations when differentiated from the amorphous state(nature) into the ordered domain(culture). The socio-spatial entity after all amounts to the part-whole relation embodied in the unitary event consisting of spatial organisation and social process. The meanings and implications of this part/whole relation will be thoroughly examined in the next chapter.

#### 3.4. CONCLUSION

Within the conceptual scheme of the socio-spatial dialectic, the domain of nature refers to the original state of space before it is transformed into cultural objects through the operation of human intentions. The domain of culture pertains to the sphere of social process in which the space in the state of nature is

organised into a whole life space. The general implication of this understanding leads to the extension by which nature comes to mean the phase or state of an entity prior to the inception of human conscious reasoning. This argument, however, requires the assumption that human conscious reason arises out of man's collective life. Here, culture comes to mean the domain of the opposite pole interacting with that of nature in the same entity.

Differentiated spaces are organised into cultural objects reflecting the cultural ideologies of a community. The fact that space organisations embody cultural ideologies to a certain degree is quite a different problem from whether the socio-spatial study should take an ideological stance or not in its scope. Societies with differing cultural ideologies may eventually sustain different ways of resolving the constraints imposed by the minimum energy principle operating in the domain of nature. Whatever direction a society may choose in the socio-spatial dialectic, the harmonious rapprochement in the interaction of the two domains of nature and culture is crucial. This is because, without this, people cannot secure a domain of order in their life space, which is meaningful to them. As a result, their social relations and therefore their community life will be hampered.

Having recognised these points, the understanding of the interaction between two domains of nature and culture must be fed into the analysis and interpretation of real examples. To envisage this interaction taking place in the real life space, we will investigate, in the next chapter, how people of a community differentiate their living spaces and organise them in their part-whole relations. The line of thought developed in this chapter will be applied to the description of Korean traditional villages in chapter 5 and afterwards will be a running theme of arguments in the thesis.

## CHAPTER 4. THE SOCIO-SPATIAL FIELD OF COMMUNICATION

### 4.0. INTRODUCTION

We argued in the last chapter that nature and culture were two complementary domains through the interaction of which the socio-spatial dialectic takes place. Social process is embedded in spatial organisation in such a manner that people of a community transform space in the state of nature into cultural objects as the way of reflecting their cultural ideologies. Here, the minimum-energy principle bridges the two domains of nature and culture. To envisage this process of the socio-spatial dialectic in a concrete framework of real life space, we introduce the concept of the field of communication as the spatio-temporal locus of the socio-spatial entity. In the socio-spatial field of communication people of a community are assumed to differentiate space into individual regions and integrate them into a structured whole for transactions of energy-information as it carries certain social values. For the proper description of the socio-spatial field of communication (with its graph-theoretic representation in mind, which will be dealt with in chapter 7) we try to set out the chief characters of spatial differentiation and the criteria by which the differentiated individual regions are identified. Differentiation of space always presupposes the integration of individual regions into an organised whole insofar as individual regions of space are assumed to have no identity except through their interrelations. This organisation of space is not regarded as fixed but as an on-going process.

The organised interrelations of the individual regions can be grasped by systematically investigating their engrained relation of parts and wholes, and we adopt the part-whole relation as an epistemological category of the socio-spatial field of communication. This starts from the question of how a part of space can be assigned

its individuality as a self-identical whole and how it is a part in the organisation of a whole at another level. To strengthen the argument for adopting the part-whole relation as an epistemological schema, we investigate how it is understood and applied in the explanation of various phenomena in the natural and social sciences and in ideological arguments. Finally we attempt to elucidate the more abstract and general ideas of the part-whole relation through a brief study of the relevant parts of Husserl's and Hegel's philosophies of systems of logic. We hope that this reflection on the essential nature of the part-whole relation helps an understanding of the process of differentiation and integration in the socio-spatial field of communication, detached from its complex manifestations at surface level.

#### 4.1. THE SOCIO-SPATIAL FIELD OF COMMUNICATION

In the socio-spatial dialectic, social men as bearers of cultural ideologies interact with space in the state of nature to evolve socio-spatial phenomena within the logic of part-whole relations. Social man differentiates space by attributing self-identity to a space through allocating to it a locus among other spaces. In this way space as a part of nature is transformed into cultural objects. The differentiation of space, that is the transformation of space from the domain of nature to that of culture, is not a process which nature generates within its own rule. It is man, or more properly social man, who carries out this process and recognises it. Space does not exist, in this respect, outside men, but constitutes their world of existence. Differentiated space as cultural objects is not an unchangeable end product but rather a moment of the structured events which the ongoing interaction between natural space and social man evolves. The differentiated space carries its self-identity or a meaning only by holding a place in the network of relations in which collective life and things are ordered in a society. Some anthropologists regard the network of these relations as being built into the normalised ways people exchange things and information in a society. We assume that the



differentiation of space and the organisation of differentiated space is one measure for ordering relations in a society, as the exchange of energy-information between individuals or groups carries social values.

Leach distinguishes two contrasting approaches in social anthropology : those of the empiricist and of the rationalist.<sup>(1)</sup> Empiricists are inclined to study observable social relations which they regard as being built into the social institutions according to the flow pattern of economic transactions. Rationalists, on the other hand, concentrate on the structure of ideas underlying the directly observable facts in a community and interpret all social interactions as acts of communication. In the study of socio-spatial dialectic, we take the same position as Leach and regard the two ways of explanation as complementary rather than contradictory in so far as acts of communications and economic transactions can never be separated in real life situations. Economic man is supposed to use whatever resources he has, social or material, to maximise the chance of achieving his goals.<sup>(2)</sup> These goals can be attained by the balance between 'material and social wealth'. In this respect, the exchange of messages and material means are interconnected to potential social values, the flow of which are regulated by certain conscious or unconscious rules, supposedly for the best benefit of a community and the best benefit of its members.

Sahlins also argues against the anomalies of dealing with material and social aspects separately in studying society as if the former refers to the exploitation of nature to meet physical needs and the latter to human relations.<sup>(3)</sup> Following Sahlins' arguments, a set of 'material forces' can never tell about cultural forms outside its integration in the cultural system. When Lévi-Strauss speaks about 'communication structures' in society, the term seems to imply the ordering relations which are derived from the exchange of material as well as non-material means between people as the act of exchange represents certain social values in

the community. However he identifies three levels of communication in society : those of women, of goods and services, and of messages. Lévi-Strauss argues that culture consists not only of forms of communication of its own, like language, but also of rules of communication which should be applied both to the natural and cultural levels.<sup>(4)</sup> He tries to find the rule structures of communications in myth by dealing with it as a kind of language in which the information is deformed at the surface level.<sup>(5)</sup> As we argued (but with a different focus) in section 3.1.1., the pattern of functions ascribed by each myth is referred to for code, and the subject matter for message. The grammatical structures of codes are invariant for all myths whereas the messages undergo transformations. In decoding the undistorted message at the deep level, the main step is to find out the transformation structures of the mythemes as exemplified in the notion of metaphoric or paradigmatic transformation. Lévi-Strauss also studied the exchange of women between groups as it is institutionalised in the kinship system.<sup>(6)</sup> He postulates that human society is a universe of communication in one way or another and the exchange of women is only one case among its generalised manifestations.

We might ascribe the transaction of material means (at the physical level) between groups and among people as the exchange of energy if we reduce it to the essential property common to all practices of it in spite of the differences in form and content. Similarly, we could represent the exchange of information in all phenomena of communication of non-material means (at the non-physical level) as a common basis of them. We are then led to presume that, in the social field of exchange, energy and information are effectively interchangeable in so far as both are transferred to potential social value at the cultural level. In society, the exchange of energy and information, whether it is institutionalised explicitly or implicitly, moulds human life directly or indirectly. The forms this takes may be tangible or intangible, mediated or not. Languages, all kinds of sign systems in the widest sense, and all sort of exchange of values measured in a society at both the

material and non-material levels are included here. Groups or institutions in every society, according to Colin Cherry, possess certain rule structures relating one part or an individual to others, which determine how information flow shall be directed.<sup>(7)</sup> And this communication binds the parts into a whole social unit. Here, the content of information is not referred to a tangible entity but as a potential of a signal. We might say that, in society, what really matters in communication is not the tangible entity or energy but the information as a social potential. However, the transmission of information is not possible except through the medium of a 'matter-energy marker'.<sup>(8)</sup> The exchange of information as the transfer of energy at the natural level is elevated to the symbolic exchange of information carried by the matter-energy marker at the cultural level in society. The incest taboo, as it is defined by Lévi-Strauss in his study of kinship structure, marks the threshold dividing the two domains of nature and culture. Here, the symbolic exchange of woman bears the function of extending and stabilising the relationships between groups beyond that of social reproduction. In contrast, as argued, for instance, by Anthony Wilden, at the natural level, for example in the natural ecosystem, the communication process is exclusively engaged in the transmission of energy as it is triggered by the information which controls the structural stability of the system in homeostasis.<sup>(9)</sup>

Hall equates culture with communication.<sup>(10)</sup> In the world of discourse where culture is seen as communication, every feature of man's behaviour in society from conception of time to perception of space, use of language, and cognition of pattern and order, carries information structured in an unconscious cultural dimension. These tell a truth even without sounds and written words. Man extended himself from the natural to the cultural dimension by elaborating humble physical functions, in interaction with the environment, into a sophisticated system. Here, 'human extension' includes all the tools, technology, language, costumes, dietary practices, and even systems of knowledge. These extensions into

the cultural domain are no longer instruments for sheer survival but are intermeshed to constitute a world of communication. In the animal world of the natural state, the use of space is routinely mechanised for every species so as to be consistently measurable under certain conditions. But man's use of space has been transformed into a cultural complex to an extent that its delicate grammar cannot be read through a mechanical analogy. Hall's concept of 'proxemics' tells that each society introduces its own characteristic spacing distances between people for different activities in an unconscious manner.<sup>(11)</sup> Hidden under the normalised ways of using space or their physical manifestations at the surface level, the unconscious cultural dimension of space use reveals the communication of social nature between individuals or between groups.

Granted that the usage of space in a community is a kind of cultural communication, its manifestations at both physical and non-physical(social) levels must be considered together for its proper understanding. There was an attempt to apply Hall's concept of 'proxemics' to the statistical analysis of spacings between artifacts in a settlement.<sup>(12)</sup> In this study, Fletcher investigated the spacings between artifacts and their horizontal dimensions in a settlement with the assumption that 'human communities use models of space in order to cope with environment'. Here, the coherent visual context which is evoked by a limited range of sizes and spacings of artifacts present in the settlement, tolerable to its occupants, is supposed to be facilitated in the community group through information conversion processes in their brains. In this process, a range of signals received from the community environment is converted to form an internally consistent pattern and, in turn, the standard way of conversion, which is held in common by all the members of the community, becomes a model by which they cope with their environment. Further, by an analysis of an archaeological example, Fletcher investigated a community's adaptation to change within this model. It is expected that a community has some internally coherent criteria by which it accepts

or rejects options according to the internal logic of the collectively held model.<sup>(13)</sup> Although this study uncovers an important aspect of space use in a community, the formal approach which reduces the interaction between people and environment to a mere mechanical process of information conversion in the human organism is dangerous because it allows no consideration of the cultural dimension. Without feedback into the cultural dimension, the accumulation of mechanical processes cannot reach the wholeness of the socio-spatial dialectic.

From the foregoing arguments we can make the following assumptions about the social field of communication : 1) the exchange of energy-information among individuals and between groups takes place at the two levels of the social and the material ; but 2) these two levels of communication phenomena are complementary features reflecting the two inseparable physical and non-physical aspects of communication which become interchangeable through the medium of potential social value ; 3) the flow of energy-information among individuals and between groups in a society is regulated in a structured way ingrained in the collective mind of the community more often at the deep unconscious level ; and 4) the use of space in a community constitutes a dimension of social communication between individuals or between groups.

If these assumptions hold true, the artificial physical environment can be viewed as one example of the settings by means of which man regulates the energy-information flows between individuals or between groups in the society according to the rules structured by their cultural ideologies. We cannot deny that there might be innumerable other factors which have contributed to shaping the built environment in a particular society, such as technological means, traditions, constraints of local climate and materials, the influence from other cultures and so on. Also, which factor exerted how much influence on the ordering of the spatial organisation in a society would be a matter of emphasis. We could say that, in one way or another, all explanations of man/environment

interactions in the social field of communication are complementary as well as redundant to each other, <sup>each</sup> inevitably bringing out the latency of its implications to some degree, since the choice of emphasis on certain factors is rather inter-subjective. It appears to be worth trying to find the deep structures underlying the interactions of all these factors, which manifest as socio-spatial phenomena at the surface level. The investigation of immediate properties at surface level such as the typological classification of spatial organisation, the geometrical analysis of euclidian shapes, stylistic interpretations, and the visual aspect of spatial organisation seem to be less likely ways of revealing the deep structures universal to all the variant species of socio-spatial phenomena.

If we assume that the built environment of a society is shaped in correspondence with the rule structures of the flow of energy-information between individuals and between groups, then the organisation of space in that society must be assumed to be ordered through the adoption of inbuilt measures regulating the energy-information flow between the individual regions of space and reflecting the mode of energy-information exchange among their occupants. We will define and elaborate the concept of individual regions of space in section 4.2.2.. The differentiation of space is carried out by distinguishing a part of space from its neighbours, generally by physical means such as enclosure, attaching certain signs, or any change of a physical nature, but also it can be done by non-physical means such as labelling or attributing specified identity to a certain category of space through social norms. Any regions of space thus differentiated are attributed to a function or a social category which demarcates the part which it is assumed to hold in the chain of spatial organisation in that social field of communication. We might call the world of structured flow of energy-information, as it is set in a spatial organisation interrelated with a social field of communication, the socio-spatial field of communication. Within the socio-spatial field of communication, the socio-spatial phenomena of a community are

expressed by how people differentiate space into individual regions and relate them in one way or another. This is basically the way a society employ the part-whole logic through which a thing (an entity) is identified as a unitary whole by relating it to other things. Things or entities thus related become parts of a whole and at the same time each of them constitute for itself a unitary whole with self-identity. In the socio-spatial field of communication, the part-whole logic is implemented by regulating the flow of energy-information between individual regions of space.

#### 4.2. THE DIFFERENTIATION OF SPACE

As far as socio-spatial phenomena are regarded to be manifestations of energy-information transactions in a community, we need to analyse its socio-spatial field of communication for the understanding of the socio-spatial dialectic. Space is one of media through the organisation of which individuals and groups exchange energy-information. Spatial organisation constitutes one dimension of social communication. Space is differentiated into individual regions and these are connected in certain ways to be integrated as a whole. The ways people differentiate and integrate space amount to a socio-spatial grammar.

However, even before we detect the deep structure of the socio-spatial grammar, we can conceive of the existence of some universals relating to spatial differentiations. This is so because people of every society have their common natural roots beyond their cultural diversities. In this regard, their ontological and cosmological references might converge to a certain degree. Universals of spatial differentiation considered this way need not necessarily be hidden deep in unconscious models but could be obvious and immediate. If so, how can we discover the hidden structure of socio-spatial grammar in a socio-spatial field of communication? This is not readily obvious or immediate either to occupants or to observers. For the analysis of the socio-spatial

field of communication, the primary task is to identify individual regions of space and the nature of their connections.

#### 4.2.1. Universals of Spatial Differentiation

We assume that certain categories of spatial differentiation in every society are rooted in the same bases universal to every culture. The space at stake here is neither the homogeneous extension of nothingness nor objects mapped in the brain of human subjects. Space understood as a socio-spatial entity is neither a thing itself nor a continuum of nothingness but a field of socio-spatial communication. Piaget's concepts of 'assimilation', 'accomodation', and 'abstract reflection' are suggestive in approaching the question of how human subjects confront space as objects before it is realised as the socio-spatial field of communication.<sup>(14)</sup> Facing the environment given, man reacts to it, differentiates, and organises it. This way, man cognises his environment in a structured way and copes with it. Here, space must be one dimension of man's environment.

Piaget refers to accomodation as the process in which objects influence the subject so that the latter adapts his action to these objects. On the other hand, through the process of assimilation, the subject superposes his sensori-motor or conceptual schemes on objects. Through assimilation, the subject integrates objects(or cognition of objects) into an already formed structure by identifying objects within an existing conceptual scheme. Assimilation and accomodation cannot be separated in this cognitive process. So, environment not only influences subjects to reflect but also causes them to adjust actively. According to Piaget, the origin of knowledge is not in the subject or the object alone, but in the interactions between them. To comprehend and come to terms with the exterior world of objects or environment, subjects organise or regulate them through actions of coordination. By means of a subject's active 'reflection' but not by the passive register of the traces of objects in subjects, the internal logic of



coordinations emerges. In the cognitive process of 'reflective abstraction', the properties of objects are not derived directly from them but from the ways the subject acts upon them.

By applying Piaget's concepts to spatial differentiation, we conjecture that the domain of nature in man, the common root for everyone in every society, constitutes one source of schemata for the differentiation of space. Man applies this schema to differentiating space and its organisation, leading to its accomodation. In this way of reflection, human subjects cognise space(environment) as objects in a certain coordinative scheme. In the process of assimilation, accomodation, and reflection in the differentiation of space, two levels of natural origin may be supposed to constitute the coordinative schema. First, as we argued about the nature/culture division in man in chapter 3, the inception of reasoning in social man lets him be conscious of his state of being severed from nature. In search of his original unity with nature, man seeks to provide an inner space of self-identity protected from the foreign outer world. Fallen in the midst of an unordered homogeneous world, insofar as he is now conscious of not being in unity with undifferentiated nature, it is imperative for him to provide a reference point. This reference point is his locus of existence in the cosmological and ontological dimensions of the world. Secondly, man's consciousness of his body(of biological origin) adds a factor to the coordinative scheme of spatial differentiation. Man's body as natural substance is subject to gravitational law. The human body moves upright with its feet touching the earth. It consists of the symmetrical division of sides. Thus man's physical natural origin is reflected in the coordinative schema of spatial differentiation. This relates to our theme that within this coordinative schema the differentiation of space possesses a universal character more or less common to every culture in its progressing in the mode of Yin-Yang dialectics having a complementary dual nature. That is : space is differentiated through complementary dualities such as

interior/exterior, centre/periphery, vertical/horizontal, lateral/longitudinal, front/back, and right/left.

Children at a prefigurative stage, when they start to express themselves by drawing, are believed to try to trace the shape of their mother's womb, following their unconscious impulse to recreate their original state of being.<sup>(15)</sup> In recreating the perceived environment of their original state through drawing, they, without knowing it, reveal the primordial nature of space as interior and exterior, which is ingrained at a deep unconscious level in the perception of environment by human beings as a reflection of their ontological and cosmological conditions of existence. As for children, so for the first man : all form begins with the circle which distinguishes the world of the interior from that of the exterior.<sup>(16)</sup> In traditional societies, the circle is usually regarded as symbolising heaven, while the square symbolises the earth — the mundane human world created by human thought.<sup>(17)</sup> In the Chinese cultural area, this concept has been applied in the act of building. For example, in Korean traditional landscape architecture, the square shape of the artificial pond and the circular artificial island built in the middle of the pond symbolise earth and heaven. If the circle symbolises the original state of unity with nature, of which man is deprived with the emergence of conscious thought, it reflects the microcosm which exists in man.

The symbolism of the yantra, which is used as a tool for meditation, well represents the Indo-Tibetan thought in which the outer world(the macrocosm) and man's inner world(the microcosm) dissolve into a cosmic unity.<sup>(18)</sup> The total union of the inner world(individual soul) and the outer world(the cosmic soul) leads to the supreme consciousness of a harmonious wholeness which is symbolised by the point in the centre of the symbol called bindu. This cosmological metaphor represents the centre of Oneness from which everything originates and returns in the end. The central symbolism of the mandala,<sup>(19)</sup> which means circle in Sanskrit, is the same as that of the yantra in that it also symbolises the

dialectics of the inner microcosm and the outer macrocosm as synthesised into a Oneness which includes the essential meanings of all things and nothingness, and the beginning and the end.

Here, the point at issue is not the symbolism of the circle as such but the primordial nature of spatial differentiation into interior and exterior. To give another example, Bachelard explores the metaphysical nature of the division of inside and outside through the investigation of poetic imaginations. This metaphor comes to mean the ontological theme of confrontation between 'man's being' and the 'world's being'.<sup>(20)</sup> Bachelard also implies that the enclosure of a being, which distinguishes its inner world from the outer world, is round. He develops this phenomenological introspection by reducing Karl Jaspers' statement that 'Jedes Dasein scheint in sich rund' (Every being seems in itself round) to that 'das Dasein ist rund' (being is round).<sup>(21)</sup>

Man's perception of space dichotomised into interior and exterior carries an archetypal meaning reflecting his ontological and cosmological condition, beyond any implications of practical adaptation to physical needs. The inner world comes to be identified with the core of self identity whereas the outer world represents that of strangers unknown. In the beginning, man starts to differentiate the homogeneous nature of space, in breaking himself from nature, by providing an interior space of his own distinguished from the exterior world. As soon as the inception of conscious thought in man distinguishes him from nature, man is severed from the original state of harmonious oneness with nature and comes to be no more integrated within the wholeness of nature while remaining a part of it. Once the emergence of conscious thought in man separates him from unity with nature, the environment surrounding him in the state of nature exists outside him as hostile and strange. It is then necessary for man to secure his own interior world which maintains his self-identity and from which he can stretch to the outside world. Man thrown into the outer mundane world, always carries the unperishable desire to return to

the original inner unity. According to Eliade, traditional man periodically repeats the creation of the world through his building activity as a ritual and renews and regenerates time by engaging in ceremonies.<sup>(22)</sup> Thus the eternal repetition of the cosmogonic act provides man with a concrete reference point in reality.

As we already mentioned in section 3.3., Eliade and Bollnow discuss man's act of spatial differentiation in different contexts but with the same implication. For both of them, man's building activity amounts to the creation of a centre as a reference point in the midst of homogeneous unordered world. If we interpret this within the framework of Yin-Yang dialectics, the existence of the centre immediately implies the existence of the peripheral region as its complementary opposite. If the centre refers to the domain of the sacred, neighbours, and orderliness, then the periphery is the domain in which those properties fade away. In this respect, the periphery alludes to the region which is the world of strangers, hostility, chaos, and the profane.

For Eliade, the meaning of the centre of the world is elaborated in the vertical dimension of human existence as religious being within a cosmogony. The centre comes to symbolise the point where the vertical axis of passage connecting three cosmic regions, heaven, earth, and the underworld, crosses the divisions. But for Bollnow, the meaning of human habitation extends along the horizontal dimension of human existence. The differentiation of space on the horizontal plane constitutes the ontological meaning of human habitation as an experienced space while that on the vertical plane suggests a cosmological reference to man. The horizontal dimension is the concrete world of man's everyday life while the vertical dimension represents the domain of eternal reality distinguished from an everchanging and perishable earthly existence. However, Bollnow believes that man cannot secure fixed sustaining relations with his environment only on the bases of the schema of vertical and horizontal planes.<sup>(23)</sup> According to him, man can be immune from going astray in the landscape of his life

space only after grasping the orientations of front and back and right and left.

Norberg-Schulz has pointed out that in early or 'primitive' civilisations, man identifies the environment in reference to himself by using terms of spatial relations such as above and below, before and behind, right and left.<sup>(24)</sup> We would argue that this is not a phenomenon only of remote societies but a universal character of spatial differentiation which is very much alive in every culture. Norberg-Schulz draws his concept of space mainly from Heidegger's philosophy in which the spatiality of being is highly developed. According to Heidegger, that something exists means that something is located somewhere in the world.<sup>(25)</sup> When we say that man exists, this comes to mean that man dwells in some location in the world. So, man's environment is neither a subjective reflection of something in man nor an object outside him, but constitutes itself man's being in the world. Norberg-Schulz contends that 'existential space' consists of 'space schemata' which are composed of universal elementary structures conditioned socially or culturally, including some personal idiosyncrasies.<sup>(26)</sup> 'Existential space', according to Norberg-Schulz, is concretised in a real dimension of human existence by the combination of the basic elements of the schemata, namely, places, paths and domains. On this line of thought, the environment is regarded as structured in domains by means of paths and places.<sup>(27)</sup> The Roman settlement, for instance, is considered to be the embodiment of this schema, in which the two main axes define the cardinal points and accordingly give birth to four domains called quarters.

The issue here for us <sup>is</sup> not the domains as such but the universal character of the differentiation of space through the imaginary directions of the lateral and longitudinal on the horizontal plane. Since ancient times the differentiation of space in Chinese cities was executed by establishing the longitudinal axis running from south to north and the lateral axis pointing east and west.<sup>(28)</sup> Hertz early drew attention to the collective consciousness of the

differentiation between two opposite sides of right and left from a physiological point of view and its reflection in religious facts.<sup>(29)</sup> This polarity comes parallel with the pairs of oppositions of pure/impure, sacred/profane, and right/wrong(sinister). Again Rodney Needham, for instance, using his investigation of symbolic systems in the Meru society of Kenya, shows that the symbolic opposition of right and left is only one paradigmatic case in the general dualistic categorisation of phenomena, by which people order their world.<sup>(30)</sup> Against the western conventions of dualism which identify right with might, good, pure and left with weakness, evil, and impure, Granet points out in his ethnographic note on 'Right and Left in China' that this kind of diametrical opposition does not apply to the case of China.<sup>(31)</sup> According to him, there is no absolute pre-eminence of one side but the alternation between the two. In this respect, in Chinese thought, there is no absolute necessity in antagonistic oppositions but in harmonious correlations. Somehow in Chinese society, the microcosm and macrocosm, which are projected into a human's body and his world respectively, and social structure, share corresponding parallels in respect of these dualistic oppositions. There is an equivalence between west and right, east and left, front and south, and back and north. And left and front are Yang and right and back are Yin. All the formal aspects of etiquette and rites follow this principle. And the same ordering principle applies to every kind of spatial differentiation in Chinese culture from plotting towns, siting tombs, locating palaces and temples, and arranging house plans. The ordering principles in spatial differentiation are systematised as a norm into the geomancy called feng-sui<sup>(32)</sup> which has been pervasively applied at every level of building activity in the Chinese cultural area. In implementing the requirements of feng-sui on sites, the core principle is to allocate the microcosm(the intended space organisation) in harmonious correspondence to the macrocosm(the world at large) in order to contain the emanating life-breath. For this purpose, the shape of surrounding mountains and the direction of water streams are carefully considered in reference to their relative locations

of front/back and left/right. These four directions are always set towards the cardinal points, except for some inevitable exceptions, with the front facing the south.

On the question of the dualistic mode of space differentiation by man, Tuan takes an anthropocentric view.<sup>(33)</sup> In this view, despite the varying degrees of difference from one culture to another in man's spatial organisations, certain cross-cultural similarities exist, because 'man is the measure of all things' commonly in every society. The human body is the measure of direction, location and distance. 'Man imposes a schema on space'. The property of the human body's posture and coordinates such as vertical/horizontal, front/back, top/bottom, and right/left is projected onto space. Apart from anthropological investigations, psycho-physiological studies also suggest the same universal base for man's differentiation of space and perception of environment.<sup>(34)</sup> This body-centered view emerges from the 'psycho-physiological postural model' of the body. From this model man's two sidedness of right/left and front/back, the upward posture subjected at the same time to gravity, and if we add our introspective point, the existence of the inside of the body contradistinctively to the outside world, and the probable centre (man's image of centre) inside the body, dictate the aspects of space differentiation and its perception.

All the evidence from different cultures shows that man's image of his body and his interrelations with other people formulate the schema of spatial differentiation in conformity with his biological needs (nature) and social relations (culture). The complementary dualistic mode of space differentiation is evident everywhere from West to East from past to present with variations only in its surface manifestations. The differentiation of space reflects the order with which people organise their collective life, classify systematically the things related to them, and express their idea of values. The differentiation of space is man's activity of ordering by providing the individual regions of space in the socio-spatial

field of communication. The differentiation of space is directed to the goal of space organisation in man's physical and social milieu. The search for order in this context comes to mean environmental cognition.

#### 4.2.2. Individual Regions of Space

We referred to universals of space differentiation as a basis which is more or less common to every culture and immediate at the conscious level. This does not necessarily imply that the differentiation of space is carried out always consciously in terms of these universals. On the contrary, apart from the fact that these universals allude to phenomena that are obvious at the surface level, the collective mind might not be conscious of the basis. Those universals let a space be related to other spaces and become a reference point. The application of these universals is the beginning of the differentiation of space. The nexus of interrelated regions of space becomes one whole. By being interrelated with other spaces and accordingly being given a locus in the nexus, a region of space becomes endowed with self-identity. We may call this region of space, which is self-identical as a unitary whole, an individual region of space.

The individual region of space is neither an atomic unit of space organisation nor an interchangeable quantitative unit. As far only as the nexus of interrelation determines the identity of an individual region of space, its individuality is defined by the qualitative interpretation of the nexus. Characteristics of the individual regions of space might be compared to some attributes of the 'monad' as defined by Leibniz.<sup>(35)</sup> As for the monad, an individual region of space has some qualities which are different from those of others and the qualities determined by the nexus of interrelations are subject to change. Once identified as an individual region of space, as a unitary whole, it has no parts. It becomes a part of a whole in the nexus of interrelations. The individual region of space cannot possess self-identity, and



accordingly wholeness, without being related to others of its kind. In this regard, the individual region of space is at the same time one whole and a part of a whole at another level. An individual region of space at a certain level in the chain of these part-whole relations has no parts in the sense that once a portion of space is identified as an individual region, only qualities based on the nexus of interrelations matter for its self-identity. In so far as only the qualitative unity of interrelations is relevant to the self-identity of an individual region of space, the parts in the part-whole relation are absorbed into another whole to lose their individual identity.

How, then, can we identify individual regions of space and their interrelations in a real life space? As we already argued in section 2.1.5., we cannot rely on inductive inference for this task. Insofar as the socio-spatial phenomenon is regarded as a cultural phenomenon, it cannot be dealt with as a collection of bits and pieces. The socio-spatial phenomenon is a whole lived by men of a community. Only interrelations between individual parts constituting the phenomenon as a whole bear any meaningful implications. A common denominator extracted from scattered elements in distinctive socio-spatial fields of communication would hardly reveal meaningful suggestions for the explanation of the socio-spatial phenomenon. The imposition of deductive axioms on the phenomenon in question would not help either. Even within the same socio-spatial field of communication, the modes of spatial differentiation vary with too much subtlety from case to case to be categorised coherently under axiomatic rules.

As there is a wide range of anomalies and variations of socio-spatial grammar in real examples, subjective interpretations of some criteria seem to be inevitable, granting these to be based on a genuine understanding of the cultural language concerned. In an analogous way to that of anthropologists who experiment on objective data through their subjective interpretation in a logically coherent manner, subjective experimentation is crucial for

the study of socio-spatial dialectic. By subjective experimentation is meant the reorganisation(rearrangement) of objects(objective data) by the knowing subject, in a logically coherent manner, according to a conceptual framework based on the understanding of the culture in which the objective data are embedded. When the observing subject interprets phenomena under the guidance of a conceptual scheme, deep insights and creative imagination concerning the culture of the community are as important as the discovery of regularities in the socio-spatial grammar. Metaphoric extension of the observed implications would lead to the better understanding of reality, as far as it is controlled within the conceptual scheme, than the formulation of rigid rules can suggest. The extension of implications reached in this way through controlled experimentation will provide the objective criteria for the identification of individual regions of space and their connections.

These criteria cannot be derived by imposing preconceived rules onto real examples. In the present study, they are worked out by carefully reading the plans of house compounds surveyed from four Korean villages. This is a part of the aforementioned experimentation. As in the case of medical doctors diagnosing patients, a certain level of understanding the socio-spatial field of communication, which was formed during a period of participant observation, is essential as a start to the experimentation in reading the plans. In so far as the differentiation of space is deeply embedded in the way people recognise and use space, spatial differentiation is regarded as constituting a grammar of the socio-spatial dialectic which is nurtured in that particular culture. On this basis the investigation of the socio-spatial field of communication must rest upon a deep understanding of socio-spatial phenomena at their micro-level. Without this prerequisite even the possibility of studying socio-spatial dialectic at the macro-level would be a vacuous assumption.

The interpretations read out from the plans are formulated into criteria for the identification of individual regions of space and their connections. This phase of study is carried out to produce results appropriate for their graph-theoretic representation at the next stage, which will be given in chapters 6 and 7. We leave the detailed discussions of real examples to remaining chapters. For convenience, we also leave the investigation of connections between identified individual regions of space until chapter 7. Here, we concentrate on formulating the objective criteria for the identification of individual regions of space. How far these criteria can apply to other species of socio-spatial phenomena or to those of other communities remains to be seen. The generalisation of the criteria could be made only through a continuous process of corroboration and enrichment from other studies.

Rapoport has dealt extensively with the problems of cognition, perception, and association and their interrelations with respect to the man-environment interaction. Our concern with this does not come from an interest in the epistemological connotations of personal psychology but originate from their reference to the differentiations of space as collective representations. Rapoport termed the ways in which people conceive and structure their environment as the 'cultural cognitive habits' and the 'cognitive style' of particular groups.<sup>(36)</sup> We might interpret these terms to mean the fact that people have their own ordering principles ingrained specifically in their culture, presided over by their concepts and attitudes towards values structured in their collective mind consciously or unconsciously. When we define cognitive schemata,<sup>(37)</sup> as they relate to man-environment interaction, as the knowledge structures by which man organises and evaluates the physical environment and orientates himself in it, this involves not only the process of cognition but also those of perception and association. Following Rapoport's argument,<sup>(38)</sup> insofar as cognition is regarded as the process through which people understand, structure, and learn their environment, these processes are all

intermingled rather than sharply distinguished in forming cognitive schemata. In so far as we limit the meaning of perception strictly to the gathering of information directly through our senses and of association in the information retrieving process with the help of indirect knowledge such as experience, and learned data, we could say that these contribute to the constitution of cognitive schemata for the differentiation of space as a form of collective representation by reflecting the cultural ideology of a society as much as individual idiosyncrasies. If one important aspect of cognition is the process of ordering by classifying things through some conceptual scheme, naming things to identify these in meaningful categories is considered the primary feature of it.<sup>(39)</sup> Naming might be equivalent to founding a world in the sense that it provides a structure of cognitive categories out of unordered state of things. Quine discusses the ontological issues on language as a vehicle of conceptual schemes, especially those of naming.<sup>(40)</sup> Through naming in its broadest sense, according to him, whether it refers to general terms, abstract terms, or concrete spatio-temporal objects, the identity of an entity is conveyed within one's conceptual scheme.

However, we should not overlook shortfalls which the concepts of 'cultural cognitive habits' and 'cognitive style' introduce and which might mislead the representation of the roles of cognition, association, and perception in the man-environment interaction. These shortcomings are made plain in the light of Piaget's criticism of the notions of association or habit as they are introduced by Hume. According to Piaget, association is meant by Hume to be only connections or replicas of external sequences.<sup>(41)</sup> For Hume, ideas are copies of impressions, and connections of different ideas registered in the subject's mind are the function of association.<sup>(42)</sup> Even the explanation of cause or effect of a phenomenon depends on the faculty of association. To the sceptical Hume, the explanation of causality as related to experience stems from custom or habit but not from reasoning. Understood as meant by Hume, association certainly concerns only the

single stage of a much wider process of assimilation.<sup>(43)</sup> Association thus understood does not involve the active participation of subjects in the cognitive process through which the existing structure is assimilated into a new one accomodating constraints presented by environment.

Piaget shows that perception must not be understood as the passive register of environmental stimuli on the subject's sensory organs. It includes the subject's volitions and intentions with accompanying actions.<sup>(44)</sup> Rapoport stresses that perception itself is filtered through the influence of the associational knowledge or of the personal needs,<sup>(45)</sup> but this argument misses the subject's active cognitive process in encountering his environment. Taking account of all these points, 'cultural cognitive habit' or 'cognitive sytle' do not provide an adequate conceptual framework to explain the ways in which people of a community interact with their environment. When we regard the differentiation of space in a community as one dimension of the collective representations of its members, there must be collective schemata though which they cope with their environment.

These collective schemata are not proven facts but would be implied in establishing the criteria for the identification of individual regions of space. In so far as we understand space as constituting man's life, it is important to observe carefully how people of a community use their life space in reality rather than simply projecting intellectual speculations upon them. One clue to distinguishing the individual regions of space comes from observing how people use a region of space differently from its neighboring regions, and, in so doing, attribute functional homogeneity and social categories to that region. This may be done by physical or non-physical means and in principle by both ways complementing each other. The physical means includes all measures of distinction relying on material nature. The non-physical means mainly belong to the social sphere. Naming as a collective cognitive dimension, social norms, and written or

unwritten codes of moral values, customs, and rules might complement the physical means.

At the physical level, the most obvious example is the making of enclosures by means of physical barriers, whether it be walls, topographical distinctions, changes in the grain of textures or material, of variations in the density of material nature. Even the marking of space by locating symbolic objects or sign posts would no less distinguish the region of space from its neighbors than more obvious material means. A barrier in a space or a change of topographical level(not gradual but in a distinctive proportion), or the change of texture of materials itself implies the differentiation of space not merely because they are perceived as differences but also, and more importantly, because they indicate the differential of energy expenditure for access as well as the transformation of information. We may also assume that the change of relative orientations of parts in a continuous region of space, in a substantial degree in relation to its neighbouring regions, introduces a differentiation of spaces within it. This is so because all these factors imply constraints or tensions in the operation of cognitive schemata. The conditions which arise from these factors might promote a certain level of resistance to the transformation of energy-information between those portions of space in question. Not only may someone receive different information from these portions of space but also he must invest differential energy expenditure for crossing over from one portion of space to the other.

Whether the physical means of differentiation is explicit or implicit, it could not work without a common consensus among the population. Some means might have more universal acceptance among people from a wider spectrum of cultural backgrounds. But other measures could convey very different information to people responding to different cultural cues. In this sense, physical and non-physical(social) levels of space differentiation are inseparably interconnected whereby social norms at a conscious

level, and the collective cognition ingrained commonly in the minds of people in a community, contribute in parallel to constituting a subtle socio-spatial grammar. These two inter-connected levels of spatial differentiation are pinned down in how the space is used by people in reality. This determines on its own the actual function of the space and its social categories. For example, the platform of a building might have been constructed for practical reasons in the beginning, for structural purposes or to protect the lower part from rain. The height and width of the base vary according to the functional categories of buildings with varying degrees of elaboration. But, once established as a type<sup>(46)</sup> in buildings, the practical reasons<sup>(47)</sup> attached to this space do not matter so much for the users of this space in everyday life. The existence of this space in their everyday life is taken for granted as a norm and its functional relations with neighboring indoor and outdoor space are fused in their life field. This space is recognised by the users as a part of living space rather than as a structural element of the building. This is what matters in the study of socio-spatial dialectic, and not the exclusive consideration of the physical nature of spatial organisation.

Sometimes a continuous spatial unit which appears to have no physical distinctions is used by people with clear divisions of functional and social categories in their minds. This is often reflected explicitly in their naming of spaces. There are found contiguous spaces part of which is used by people for different functions without clear-cut physical distinctions. More often different names are attached to these parts, which are associated with the orientation or the neighbouring space with which these are intimately related. As there are no apparent physical demarcations here, there creeps in a certain degree of latency in deciding the criteria for a differentiated region of space with an individual identity. From one point of view, this decision could be a matter of the grain of differentiation determined by the characteristics of the investigation. For example, the stage or the auditorium in a theatre can be considered as one space but in another way these

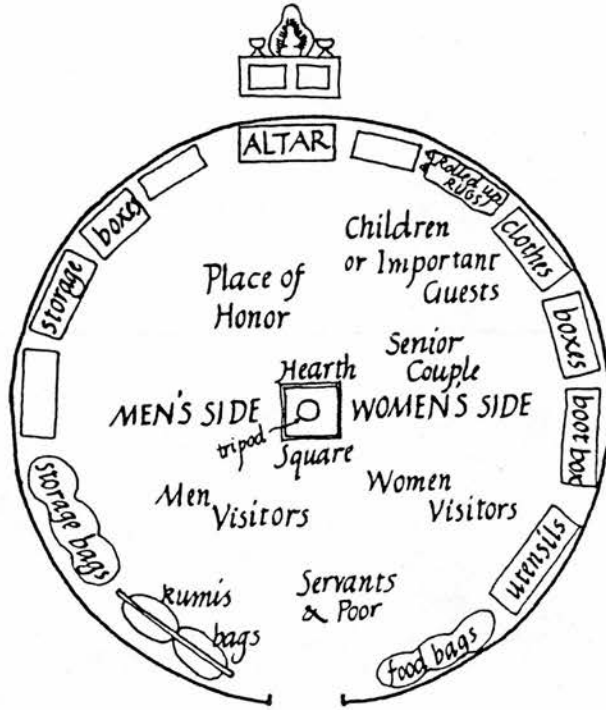


Fig. 4-1. Plan of Mongolian yurt (from Faegre(1979), p. 91).



could be subdivided into two or more independent individual regions of space. We can understand the Mongolian yurt(fig. 4-1) as a case where there are no clear-cut physical barriers indicating territorial divisions except some minor fittings<sup>(48)</sup> ; only social rules appoint everyone and everything to its place, which are accepted naturally and agreed upon commonly by the people of the community. Furthermore, even when we fix criteria for identifying differentiated spaces, each example varies subtly from one case to another as a manifestation of any socio-spatial grammar, so a certain degree of subjective interpretation is inevitable.

As the two levels of differentiation are intimately interrelated and complement each other, when the physical means is not strong enough to define an individual region of space unambiguously in terms of its functional homogeneity or social categories, social norms reinforce the weakness of the physical means. In some cases, non-physical means(social norms, customs, taboos, or tradition) are so strong that only a minimum level of physical indication is required for the differentiation of individual regions.

There is also another category of space which is not well defined through either way. Generally, outdoor spaces within house compounds belong to this category and the detailed accounts of this will be given in chapter 6. However, this originates from the fact that even well defined individual spaces and their relations are always subject to change whether it be slow or fast. Moreover, people do not necessarily differentiate actively the whole of their living space without any remainder. People of a community also intentionally maintain a certain level of flexibility for their use of space, usually with emphasis on certain categories of space. This flexibility often corresponds to their seasonal requirements for production(farming) or to recurring social events throughout the year. For these reasons, the individuality of some spaces is ephemeral.

The differentiation of space is also subject to the minimum energy principle discussed in section 3.2. The dimensional proportion of one region to others and to the whole space must be within a proper range for the spatial organisation to function most energy-economically. In addition, there must be a quantitative limit to the number of individual regions of space which can be effectively connected to a whole at a certain level of grain of differentiation. If the dimension of a space is over-large in relation to the space organisation as a whole, then it is not likely for it to be a unitary whole without division into multiple spaces. This situation would be uneconomic in the process of energy-information transactions between neighbouring spaces. Every spatial organisation, whether it be animate, inanimate, natural, or artificial, must have certain limits on the range of proportional constitution of parts in its physical dimensions, if it is to function in the space organisation in an energy-economic way.<sup>(49)</sup> Therefore the further differentiation of an overly large space into multiple independent but interrelated spaces is inevitable. For example, a long street or a long corridor is physically a continuous unitary space, but in the context of the socio-spatial field of communication, it needs to be regarded as a set of multiple individual regions of space differentiated in response to the physical properties of the interconnected buildings or rooms and their functional contents. The minimum energy principle not only operates in the equilibrium of constraints caused by physical nature but also together with people's intentions of how to use and organise space for their purposes. The two factors of spatial differentiation, the differentials of perceptual field and the minimum-energy principle, should be considered only in their intimate relations to how people of a community actually use and organise their life space. This is because, as we argued in the previous chapter, the differentiation of space is carried out by people in the way of accommodating constraints present in the domain of nature within their cultural potentials.

### 4.3. THE LOGIC OF PARTS AND WHOLES

Let us now return to a discussion of the socio-spatial field of communication, with a shift of emphasis towards its part-whole relations. In the socio-spatial field of communication, transactions of energy-information between individuals and between groups are carried out through the medium of spatial differentiation. The act of differentiation transforms homogeneous space into individual regions. The individual regions of space thus differentiated are connected in one way or another to give birth to spatial organisations. A spatial organisation is one whole at that level of consideration. Individual regions of space also are wholes, but, once organised, these are integrated into another whole.

We have introduced the part-whole relation in different contexts throughout the thesis where necessary without adequate qualifications. Even though the part-whole relation is considered to be no less important than the Yin-Yang dialectic as a primary base of the socio-spatial dialectic, a detailed discussion of it has been delayed until it could be examined intimately attached to the framework of the socio-spatial field of communication.

#### 4.3.1. Individuality and Part-Whole Relations

An individual entity cannot be divided at the level at which it has self-identity. Any individual cannot exist without relations to others of its kind in the world. In taking part in the nexus of interrelations, it becomes a part of a whole at another level. Jung's concept of the process of individuation gives a general idea of the individuality of an entity and of its wholeness.<sup>(50)</sup> For Jung, psychic reality consists of consciousness and the unconscious. Here, the unconscious refers to the collective unconscious which amounts to the phylogenetic substratum of the psyche. The unconscious is not a repository of repressed or averted consciousness. The conscious is not the master of the unconscious. On the contrary, the unconscious is the origin of

consciousness. Consciousness is presided over by ego in its centre. The ego-centered conscious as a half of the psychic reality always moves towards excluding and dividing things. Only the rapprochement between two halves, not the control of one by the other, gives birth to an indivisible self. Individuation means the process by which the self is developed or formed. The self is the real centre of a 'psychological in-dividual' which is a self-identical whole. The process of centring towards the self does not lead to seclusion from the world outside. Individuation rather breaks down the barriers built up by ego between itself and the surrounding world.

We can extend this meaning of individuation towards its implications for the individuality of a space and its wholeness in the socio-spatial field of communication. By attaining self-identity, the individual is ready to communicate harmoniously with the world outside. This amounts to saying that the individual as a unitary whole, whatever it refers to, can properly relate to other individuals in the world. Instead of shutting off the world, the real individual having self-identity opens itself up to be a part of a whole at another level. Only self-identical individuals are endowed with a location in the nexus of their interrelations which constitute a whole. From this perspective, the individuality of space and its part-whole relations are different from those argued in the natural sciences. In the inanimate world with which physics is concerned, a whole is constituted of homogeneous classes where parts are interchangeable so as to have no discernible identity while, on the other hand, in the animate world of biology, a whole is constituted of inhomogeneous classes where parts possess their identity (individuality). The concept of individuality in a 'class of objects', whether it be a 'set of elements', a 'collection of things', or an aggregate of individuals, plays a key role in distinguishing between living and inanimate matter.<sup>(51)</sup>

In dealing with the inanimate world, homogeneity and interchangeability become the main features while, in the living

world, heterogeneity and with it individuality are found together with the variety which exists in it.

In the socio-spatial field of communication, space cannot be categorised either as an animate entity of heterogeneity or as an inanimate entity of homogeneity. As we argued in section 3.3., space is understood as one dimension of the manifestations of socio-spatial entity. Here, space is no more a material extension or a void but its organisation, which is intermeshed with the social process, is counted as a unitary event. Individual spaces are actual occasions which are to be interrelated in a determinate way to become a one whole. Once the nexus of these interrelations is realised into an event of unitary wholeness, the individual spaces which took part in the process become invisible. A space is endowed with an individuality only as a potential for becoming a unitary whole. Individual spaces are parts only as potentials of a realised spatial organisation of unitary wholeness. The nexus of interrelations only matters in this part-whole relation. The spatial organisation realised through the nexus of interrelations is an individual space at another level. Any individual space is a whole which cannot be divided not because it is an atomic unit but because the nexus of interrelations as process cannot be recovered.

#### 4.3.2. Part-Whole Relation as an Epistemological Schema

The relationship between the whole and its parts has been a basic theme employed in many fields in an effort to improve understanding, whether it be the world of organisms, inorganic matter, the human world of society, or even man's way of thinking. The concept appears in different guises from field to field with consequent connotations fitted to the subject matter, such as atomistic and holistic views in the physical sciences, ontogeny and phylogeny in biology, methodological individualism and methodological holism in the social sciences, member and class or particular and universal in logic, and quality and quantity (or one and many) in philosophy. The part-whole relation does not seem to

be only a way of explanation only for one subject matter or another, but a basic mould of the universe in its ontological dimension. We are not certain whether this fact, that every kind of discourse relies, in one way or another, upon the part-whole relation as a schema for the explanation of its subject matter, originates from the ontological base of the universe. At least, it should be so because the part-whole relation constitutes a fundamental epistemological category through which one gets to knowledge of that subject matter. In this connection, many discourses of an ideological nature also adopt the part-whole relation as an explanatory schema. So far as our arguments go, we believe that the part-whole relation is a significant epistemological schema for understanding of what the socio-spatial field of communication consists and how it operates, and further for understanding the socio-spatial dialectic. We shall concentrate on the epistemological implications of the part-whole relation by examining some examples of relevant work which employ it as a schema.

Since the ancient Greeks, Western thinkers have been divided into antagonistic ways of thinking between the 'Atomistic School' and the 'Holistic School'.<sup>(52)</sup> The classical atomistic view holds that the universe is made up of ultimate particles which cannot be divided and is permanent ; on the other hand, the holists regard the universe as an organism of wholeness in which every part is harmoniously related and the whole is more than the sum of its parts. The holists tend to emphasise the laws which describe how complex systems change in the course of time, while the atomists are concerned with the discrete structure of the system. Quantum theory and relativity raised serious questions about the traditional atomistic world view whereby the universe is interpreted in terms of structures and functions of aggregates of separable atoms.<sup>(53)</sup> Here, the distinction between the observer and observed also loses its meaning as they interpenetrate each other and appear as one indivisible whole. In this cosmological framework, the world is

more likely to be viewed as an universal flux of events and processes.

Part-whole relations move in the theory of evolution along the line of ontogenesis/phylogenesis arguments. Ontogeny and phylogeny seem to be complementary processes in the evolution of organisms. In the ontogenetic process, the organism as a single individual transforms the hereditary genetic potentials(genotype) into real shape(functioning structure or phenotype) in the milieu in which it happens to be located, in response to the internal and external factors which the environment imposes on it. The phylogenetic 'vertical link' is also supposed to play a role in the organism such that the mutation of genotypes goes through certain ordering procedures in developing phenotypes. On the vertical line of phylogenesis, the organism as a member of species is a link in the chain of evolution in transmitting the genetic potential acquired through natural selection to the next generation. Every character of an organism is both 'inherited' and 'acquired' as it is developed through the interconnecting processes of phylogenesis and ontogenesis.<sup>(54)</sup>

Considerations of the foundations of the concept of number are based on how the part-whole relation is looked at. In the foundation of set theory, the concept of cardinal number is given priority over that of the ordinal. If we can pair off the elements of two sets, the two sets of objects are defined to be numerically equivalent. Every set possesses the property of cardinal number so far as the criterion of numerical equivalence gives rise to a number. The concept of set produces that of number through the abstraction of the nature of the elements of the set. Instead, intuitive mathematics finds the concept of number in 'complete induction' where the sequence of natural numbers is generated step by step from 1 by the successive yielding of the next following number.<sup>(55)</sup> Here, ordinality is considered to be the constitutive character in the concept of number as every number presupposes the preceding ones. In the set-theoretic foundation

of number, the wholeness of the set amounts to the aggregation of discernible parts(elements). But, within the scope of intuitive mathematics, number inheres in the relation between whole and its parts as units for a given whole. So the distinctive two wholes do not necessarily mean two different numbers. Following the intuitive standpoint, the essential character of the continuum in the world of numbers does not fall under the notion of the part-whole relation in a set but come from that of extensive wholeness.<sup>(56)</sup>

In logic, the part-whole relation seems to be the underlying theme of arguments about the relation between particular and universal and between member and class.<sup>(57)</sup> Usually, particular refers to an individual entity which can be pointed to or referred to with its spatio-temporal identity. On the other hand, universal refers to anything shared by those particulars and it need not necessarily be pointed to with its spatio-temporal identity. When particular and universal entities are related in language or knowledge systems, the particular seems to imply, whatever it may refer to, to the individual having self-identity. Many particulars commonly sharing a certain universal or universals can become another individual entity at another level. In symbolic logic, class is defined as a collection of entities with a certain property. Individual members as parts of a class can be grouped in sub-classes. Members of a class or different classes are related with certain formal properties such as identity, reciprocity, inversion, and correlation. The operation of these formal relations leads to certain structures of inclusion, congruity, and symmetry or asymmetry.

Piaget recognised the importance of this part-whole relation of logical structure in the study of psychology and tried to construct a 'psycho-logic'.<sup>(58)</sup> He investigated how the logico-mathematical operation develops in childhood through experiments on the child's conceptions of number and geometry, in which the algorithm of the whole and the part plays a main role in forming the logic of classes



and propositions.<sup>(59)</sup> Class and number are said to have the same basis of additive operation by which the elements are brought to a whole, and with its reciprocal operation the whole is divided into parts. On the other hand, they are distinguished in the fact that the parts are homogeneous units in number whereas the parts fall under a class by virtue of their common qualities. The results of the experiments carried out by Piaget show that only after children reached the stage where the notions of invariance and conservation of numerical wholes are acquired, can they group the property of permanence in the relations between the part and the whole in classes. For children at an earlier stage, when their mental operation lies mainly on the plane of perceptual intuition which is immediate and irreversible, it is impossible to deal successfully with the additive operation (inclusion) of classes. When they can handle the reversible mechanism of a formal operation which is formed through the process of 'reflective abstraction' they can manage to deal with the additive synthesis of the parts into a whole and the co-ordination of the attributes defining the classes.

Piaget's experiments on the conservation of quantities and on the correspondence of cardinal sets show that children at the early (pre-operational) stage find difficulty in recognising the permanent character of a whole when it is transformed by deformation or displacement. The analysis of the early stage of additive composition of classes gives the same indications where the part separated from the whole is no longer conceived in conjunction with the initial whole. On both the numerical and the logical planes, at the early stage of child development, the relationship of part to whole is neither a 'fractional relationship' nor that of inclusion but merely a 'qualitative participation'. As in the case of the logical inclusion of classes, the lack of recognition of the part-whole relation produces the same difficulty for children in understanding the additive composition of numbers, which bear the same whole with a varied composition of parts. In the case of the subdivision of areas, children display the same difficulties of understanding the part-whole relation as those involved in logical

subdivision or the nesting of partial classes within an inclusive class.<sup>(60)</sup> Only when a child has built up operational anticipatory schemata at the operational stage, can he successfully carry out the subdivision of continuous wholes by recognising the fractions beforehand as parts related to a divisible whole.

These few examples show how deeply the knowledge system and the cognitive process, as well as human reasoning, are ingrained in the part-whole relation. And the involvement of the part-whole relation in the epistemological question does not stop there. Even the Question of the origin of knowledge depends upon the understanding of the part-whole relation. Mannheim is of the opinion that knowledge is from the beginning the product of a community of collective knowing but does not originate from within the individual knowing subject.<sup>(61)</sup> Moreover, the arguments about how we can properly grasp the knowledge of social or cultural phenomena also hinge on the interpretations of the part-whole relation.

As mechanism is contrasted with organism in the natural sciences, so methodological individualism and methodological holism are distinguished in the social sciences. From the point of view of methodological individualism, the ultimate constituents of society are individuals whose dispositions, beliefs, and configuration of physical resources result in the institutions and events in society. On this approach, social processes and events are understood to be drawn from the laws governing the behaviour of individuals. In ~~the~~ historical explanation, the individualistic method attempts to reconstruct the historical situation in the way individuals responded to the particular situation, with their dispositions, to produce the result in question. The regularities in historical explanation are reached by the extension of the same principle in reconstructing the way typical dispositions of anonymous individuals responded repetitively to a number of historical situations with a similar structure to produce the regularity to be explained.<sup>(62)</sup>

Methodological holism states, on the contrary, that social systems constitute wholes which are not mere regularities deduced from interacting individuals and so, in this case, are suprahuman. Following this view, individuals are born into a society which already exists and is not of their own making. The 'psychological facts' cannot be formed independently of cultural ideologies which were handed down from generation to generation through collective life in that society.<sup>(63)</sup> Though individuals certainly contribute in transforming the culture into a new one, 'societal facts' have an autonomous domain of their own independent to a certain degree of each member's dispositions. In this view, social phenomena should be explained by being deduced from macroscopic laws which apply to the social system as a whole.

As we already discussed in section 1.1.2., Durkheim regards the study of collective representations as the principal task of sociology. For Durkheim, even religion is understood as the institution created by society to embody the self-consciousness of collective life in symbolic forms.<sup>(64)</sup> All differentiated forms of human thought are reckoned to have originated from the collective representation of primitive religion with gradual progress in the division of labour and accordingly the differentiation of 'conscience collective',<sup>(65)</sup> which has been initially integral in traditional society. Individual minds take part in producing the social phenomena as a whole by their association. The resultant social fact produced is not the same as the sum of the individual representations, but is exterior to and surpasses them. Social phenomena are the products of a whole and collective representations are only social. Whether it be a traditional society of 'mechanical solidarity' or a modern society of 'organic solidarity', collective representation, as a prime arbiter of social phenomena over individual representations, persists in transmuted forms corresponding to the successive development of society.

In contrast to Durkheim's emphasis on the external and constraining aspects of social norms as the basis for social facts,

Tarde emphasised the individual differences and their consequences.<sup>(66)</sup> For Tarde, imitation is the most distinctive characteristic of social facts, while, for Durkheim, the imitative motives in all individual consciousnesses, and tendencies accumulated by repeated actions of individuals, are not social facts so far as they are not taken into account collectively. From Tarde's view of methodological individualism, any social facts, whether they be language, moral rules, or religious customs, are transmitted from one individual to another but not from a collective body of social group to individual. The individual facts, therefore, are the elements of social facts but not mere manifestations of the autonomous reality of collective facts which are abstract, general, and coercive to the individual. Social facts, according to Tarde, do not exist independently outside the consciousness of each member of society as a wave in the ocean coexists with the movements of innumerable molecules. Societies exist piecemeal in a state of continual repetition by living individuals.

The methodological division of individualism and holism is not confined to the cognitive dimension of social phenomena. Although they might not be separable from views of the cognitive dimension, the division of arguments extends to that of ideology whereby the relation between individuals or between individual and society(institutions) is defined within a social vision which the ideology advocates towards values. We restrict here the use of the concept of ideology<sup>(67)</sup> to a specific sense as a view of the part-whole relation on the basis of which rights, obligations, and roles of individuals and society are defined. This relates to the value judgment attached to the views of the part-whole relation in a society.

When Popper criticises holism, he identifies the basic idea of it with that of historicism in one way and with that of utopianism in another.<sup>(68)</sup> A utopianist is understood here to believe that he can re-construct the society as a whole at one stroke according

to a definite blueprint prepared by conscious reasoning. By historicism is meant the idea that there are definable laws or patterns in the development of history by which we can predict the future events in a society along a pre-conceived line of thought. Popper advocates piecemeal social engineering, against holistic or utopian social engineering, whereby institutions and the running of society are planned in a step by step adjustment with the consciousness of the fact that a conscious design based on human reasoning cannot achieve its ends without latent unwanted results. Holism suggests that society is more than the sum total of the relations between its members, in analogy with living organisms. From this point of view, as the study of organisms cannot proceed from an atomistic approach, social facts cannot be dealt with as combinations of individual facts. In correspondence with this view, according to Popper, historicism claims that we must study the history of the aspects of society as that of a unique organism to understand the society. But Popper does not totally reject the idea of wholeness as far as it means the aspect of things which reveals structural regularities as is shown, for instance in the idea of Gestalt. But he continuously maintains that even the whole, whether it be society, organisms or inorganic matter, cannot be scientifically grasped without the piecemeal understanding of component aspects.

Popper, however, accuses Mill of being a holist on the one hand and a methodological individualist on the other.<sup>(69)</sup> Mill's holistic approach to sociological inquiry intends to find out the causes which produce the 'State of Society'. 'State of Society', here, means 'the simultaneous state of all the greater facts or phenomena' as a whole organism. The accusation of methodological individualism comes from its strong connection with psychologism which Popper relentlessly attacks. The doctrine of psychologism pleads that the explanation of social phenomena must be induced ultimately from psychological laws since society is the product of interacting human minds. Popper, the protagonist in defending his own form of methodological individualism against methodological

collectivism or holism, does not deny that the existence of men and the origin of their institutions are from the start social. But the point where Popper disagrees Mill is the way both holism and individualism are inclined towards historicism and collectivism. The holistic version of historicism is regarded as being interested in the development of society as a whole so as to intend to design the course of development of society as a whole according to rational laws manifested in history. On the other hand, the psychologistic brand of historicism brings in the idea of 'historico-causal' development whereby all the conditions of the social environment are explained as the effects of conscious human intentions and consequent deliberate acts.

In spite of Popper's suspicions of Mill's concepts of individual and society, there is no doubt that Mill himself was a staunch defender of the importance of individuality in society.<sup>(70)</sup> Mill contends ~~that~~ that the preservation of individuality and the enhancement of diverse individual faculties are the ultimate precondition for the well-being of individuals. As far as individuality is considered to be the basis for the progress of culture and civilisation, it should not be sacrificed to the despotism of custom ; human nature should not be surrendered to the will of God, and individuals must not be submerged in masses under the name of majority, so giving up their power to the 'collective mediocrity'. But, Mill does not lose sight of the fact that individuals are members of a collective body. Though the ability of society to resist individual liberty must be carefully limited and defined on the grounds of general presumptions reasonably acceptable to the members of the society, an individual is expected not to hamper another's interests for the sake of his own. For Mill, it is indispensable for individuals to follow a certain line of commitment anticipated by society in return for the benefits it provides for individuals.

Hayek classifies Mill's individualism as a pseudo-individualism, strongly influenced by the 'rationalistic individualism' of the

French tradition stemming from Decartes and Rousseau.<sup>(71)</sup> From the point of view of this rationalistic individualism, every aspect of social phenomena is the direct product of the act of individual reasoning and therefore society as a whole can be directed to a goal by controlling individual reason. In contrast, 'antirationalistic individualism', which Hayek considers to be the true individualism, and which is rooted in the British tradition of thought (mainly those of Adam Smith, Adam Ferguson, and other thinkers of the 18th century) assumes human reason to be imperfect and fallible, and therefore contends that many aspects of anonymous social processes are not the direct result of conscious human reason. Hayek also holds that, as an essential concept in the theory of society, individualism cannot afford to rule out the fact that individuals are nurtured by their existence in society in so far as it maintains that social phenomena can be properly understood only by investigating individual actions in that social milieu. Although individuals inevitably submit themselves to the anonymous irrational forces of a society which is seemingly independent of human intention and conscious design by reasoning, this social process is superior in so far as individuals are free and are not imprisoned within the bound of an allegedly perfect reason.

Methodological individualists draw their understanding of social phenomena exclusively from the dispositions of individuals of a society in question. Without denying the fact that every individual is a member of a society, here individual dispositions as self-sufficient wholes, and at the same time as component parts of a phenomenon, constitute societal facts. For methodological individualists, parts are related only within a framework in which the result of these relations presupposes the individual parts at the diachronic time scale. For methodological holists, individual dispositions, from the start, are parts of a collective living body as a whole. Individual dispositions originate from the whole in which these are component parts.

The sharp division between methodological individualism and methodological holism seems to stem from differences of understanding of the part-whole relation in its time-bound nature or cause-effect property. Any nexus of interrelations, to whatever it may refer, might be considered as the 'extensive quantum' (see section 3.3.). Within this conceptual scheme, the part-whole relation does not develop in a linear progression or in a cause-effect relation. At any level of consideration, part and wholes in the nexus of interrelations mutually cause the other and at the same time each is an effect of the other. Individual dispositions are identified as a unitary whole only in the interrelation of parts constituting the societal fact as a whole. Here, the part-whole relation does not proceed in a linear progression but extends synchronically along whichever plane is being considered : the vertical and evolutionary and the horizontal and cyclic.

#### 4.3.3. The Logic of Parts and Wholes

Before we further elaborate the central theme of part-whole relations in the socio-spatial field of communication, let us make clear where we stand in the division of views of the part-whole relation. As we argued in the end of section 4.3.2., the division of views as to whether knowledge of reality comes from the conceptual framework constructed on the basis of individual entities or on the basis of the structured whole seems to be a matter of degree rather than a clear distinction. It seems to be more important to look at the relation of parts and wholes for any entity than to look at reality from one side of the division or the other. In real life, every person is conscious of himself as a being enclosed in himself as well as being a part of a living whole.<sup>(72)</sup> Everyone shares in a life of community of some kind. Individuals intervene creatively in the transformation of society. At the same time, their contributions to their community are involved in the nexus in which they live. There is a constant



interaction between the two active forces of groups and individuals. Thus, human life is immersed in part-whole relations.

The complementary interaction between two modes of thinking, one for the part and the other for the whole, seems to constitute the basic mould of the human mind. We all to some extent orientate ourselves in both ways but for the best in unison.<sup>(73)</sup> How, then, can we assess the cognitive values of statements which refer to the part-whole relation in one way or another? Nagel deals with the meaning of part-whole relation by concentrating on the distinction between 'functional(or organic) wholes and nonfunctional(or summative) wholes'.<sup>(74)</sup> Here, functional whole does not draw its identity from the summation of the part-processes of individual elements but is determined by the intrinsic nature of the whole. In contrast, the identity of the nonfunctional whole is drawn from the total sum of the part-processes of individual elements. The adoption of this distinction in a statement is supposed to be based on the choice of viewpoint concerning what causal influences may be set aside for the explanation of a given subject matter. Nagel regards the distinction of the two views of part-whole relations as a matter of emphasis and degree in that no general criterion has yet been found to distinguish clearly between the systems of organic wholeness and those of additive wholeness. This argument is strengthened by a further postulate that, in the analysis of systems of whole, there can be no exclusive adoption of one or the other between the 'additive' analysis and 'non-additive' one.<sup>(75)</sup>

Nagel's distinction between systems of organic or additive wholeness resembles Husserl's distinctions of 'moments' and 'pieces'. Husserl defines parts and wholes by primitive and irreducible terms in an undifferentiated, general way.<sup>(76)</sup> For him, simple objects are those which have no parts, complex those with parts : complex objects are wholes with parts. Parts are then distinguished between two types in which 'moments' come to mean parts that permeate each other and 'pieces' are parts that do not

permeate each other and so are separable from their wholes. Husserl adopts the part-whole relation as a basic schema of his 'pure logic' which tries to reveal the inner intuition of the acts of thinking and to identify it through descriptive concepts relating to the pure givenness of experience. In so doing, resorting to consistent inner intuition, consciousness achieves objectivity.

R. Sokolowski sums up how Husserl applies the part-whole schema in analysing the intentional acts of subjectivity as well as in the theory of ideal grammar.<sup>(77)</sup> Husserl also employs the logic of parts and wholes in explaining how objectivity in consciousness is achieved by transcending the intuitive subjectivity of experiences and intentions. Sokoloski regards moments and their relationships to one another and to wholes (but not pieces and their relationships to wholes) as important for Husserl's philosophical ideas. Following these ideas, a verbal meaning is only a moment of a greater whole of a 'meaningful word'. Intentions are not pieces of the stream of consciousness but are moments that cannot be separated from sensible data. Categorical acts, on which categorical objects such as relations and propositions depend, are only moments of a whole which consists of categorical acts and acts of simple perception. Material objects perceived (presented in consciousness) are understood as the synthesis of profiles of objects for profiles are moments of a whole. Intentional acts are also composed of parts which are moments inseparable from the whole. Even perception is itself a synthesis of multi-level moments for example, desire, seeing, etc..

In his 'Logical Investigations', Husserl attempts a theory of pure concepts and pure propositions pertaining to 'a priori truths' in the 'unconditioned necessity of their generality'.<sup>(78)</sup> Here, the part-whole relation is an epistemological schema of pure logic through which enquiries are undertaken of the basic categories of objects regarded as possible objects of cognitive consciousness. Through these inquiries, the multiple modes of consciousness hidden in man's thinking life are revealed with objectivity.

Husserl's logic of parts and wholes helps us conceptualise the socio-spatial entity in the socio-spatial field of communication. Following this logic, social process and spatial organisation are moments of the socio-spatial entity as a whole. As the organisation of neural substrata constitutes a vehicle of energy-maker for a human individual in contrast to its psychic domain, space organisation is the spatio-temporal locus of socio-spatial entities in the socio-spatial field of communication. Space organisation, understood as a sphere of energy-makers in the socio-spatial field of communication, is not a homogeneous collection of interchangeable members. Individual regions of space are not the reduced elements of a space organisation. Individual regions are moments of a space organisation as a whole. Accordingly, a space organisation is the relational totality of individual parts as moments of a whole.

We can further attempt to demonstrate the generality of the part-whole relation as an epistemological category of the socio-spatial field of communication by reflecting on its nature using the text of Hegel's 'Science of Logic'. Hegel attempts to attain a level of abstract generality of categories which are employed as bases of conceptual frameworks for the understanding of the nature of ultimate reality.<sup>(79)</sup> Hegel's comprehensive analysis of categories elucidates the point that all the opposing categories are mere one-sided abstractions. The generality of these categories is reached in analysing them independently of their connection with all sensuous concretes. According to Hegel, the essential relation of whole and parts consists in the 'self-subsistence of immediacy' reflected into itself whose moments, through 'Existences', are at the same time held in unity.<sup>(80)</sup> The self-subsistence reflected into itself is at the same time a reflection into its opposite. The 'immediate self-subsistence' identified with its opposite is within itself a manifold variety. The manifoldness includes within it also the relation of the unity of the reflected self-subsistence. The whole and parts are related in 'such a manner that each has the other reflected in it

and at the same time only is as this identity of both'.<sup>(81)</sup>  
'The whole is the self-subsistent, the parts are only moments of this unity', and also the self-subsistent and their reflected unity are only a moment.<sup>(82)</sup> Both whole and parts are negative unities each of which substance is realised in its opposite. What makes the whole a self-subsistent totality is its other, the parts. Parts attain their self-subsistence only in the reflected unity of the existent manifoldness. Thus the whole and parts condition and also presuppose each other.

An individual region of space as a whole for itself and at the same time as a part within a total space organisation is not merely a part, simply decomposable from the spatial organisation, but a moment of the space organisation as a whole. In so far as the socio-spatial entity is the synthesis of the two moments of social process and spatial organisation, the individual regions come to existence through the differentiation as a process of a whole consisting of the two moments of the social and the physical. On the other hand, universals of the spatial organisation are posited in nature as immediate moments before they are sublated to its an other, culture. Differentiation in its turn is also a moment to be sublated to its an other moment, integration, giving birth to the organisation of space in the socio-spatial field of communication.

The part-whole relation thus understood provides us with an epistemological framework on the basis of which real examples of the socio-spatial field of communication can be analysed and interpreted. The process of differentiation and integration of space continues in conformity with the logic of parts and wholes, corresponding to the condition of energy-information flow in the socio-spatial field of communication. The organisation process of part-whole relations in the socio-spatial field of communication equals the interrelated function of the differentiation and integration of space. From this perspective, in chapter 8, the properties of differentiation and integration will be the chief

basis of formulae from which to draw structural parameters of the socio-spatial field of communication.

#### 4.4. CONCLUSION

In the domain of nature, the differentiation of energy-markers (see, section 4.1.) into parts, and their integration into a whole, follow the line of the minimum-energy principle at an exclusively physical level for the conservation of the organised whole. Whereas the minimum-energy principle is an inner necessity in the domain of nature, the same principle operates as a constraint in the cultural domain of the socio-spatial field of communication. Quite apart from the autonomous level beyond human control, the organisation of space as a sphere of the socio-spatial entity is the product of choices or intentions by people of a community under the constraint of the minimum-energy principle. When the part-whole relation is adopted as an epistemological schema for the analysis of the socio-spatial field of communication, the organisation of space is not here considered as an homogeneous class of natural objects. Because the organisation of space is a cultural object, a part of it can be endowed with individuality.

When space is differentiated into individual regions and then these are connected into a whole, the starting point of this process is when man synchronises the properties present in his(internal) domain of nature with those of his environment. In this way, universals of spatial differentiation are the primary base of nature/culture interaction in the socio-spatial dialectic. The initiation of this interaction comes from man's consciousness of the part-whole relation among his fellow creatures and objects around them. Objects are accommodated<sup>m</sup> with meaning into the thread of his life space in the ways of relating them in a part-whole relation which is ingrained in his social life. Insofar as people's activities are understood as energy-information transactions, individual regions of space thus differentiated and organised can only be functional within the framework of the part-whole relation

reflecting the inhabitants' social values. As men perceive and organise relations among themselves and things around them in a part-whole relation, the best way of understanding their living environment is to undo this process as it has been frozen in the socio-spatial field of communication.

While discussing the concepts of the socio-spatial field of communication and the part-whole relation, we were able to thread together the concepts developed in the previous chapters such as the socio-spatial phenomenon, the socio-spatial dialectic, the socio-spatial entity, the principle of least effort, and the nature/culture distinction. Though latent implications of these concepts have been made explicit, it will not be until the real examples of the socio-spatial field of communication are analysed and interpreted that their implications and meanings can be focussed accurately.

At that stage, these concepts themselves may attain their self-identities in the nexus of their interrelations, being elevated to a whole transmitting live meanings of reality.

To reach that goal, that is, in order to analyse and interpret the real examples in a coherent framework in the final chapter, the surveyed data are converted and arranged into analysable objects and the criteria for this conversion are laid out in chapters 6 and 7. To prepare for this task, we present, in the next chapter, a general description of Korean traditional villages.

## CHAPTER 5. TWO POLES OF THE SOCIO-SPATIAL FIELD OF COMMUNICATION

### 5.0. INTRODUCTION

In the last chapter we set out a conceptual framework concerning the socio-spatial field of communication, within which to investigate the socio-spatial dialectic operating in a real life-space. The chief character of the socio-spatial field of communication was assumed to be the differentiation of space into individual regions and the organisation of these into a single whole through integration. We also argued strongly that the part-whole relation was the prime epistemological category through which to gain knowledge of the process of spatial differentiation and integration in the socio-spatial field of communication.

Before moving to the investigation of some Korean villages as real examples of the socio-spatial field of communication, we present a general description on the basis of the culture and society of Korean traditional village society. Villages were the basic neighbourhood units and there were no such settlement areas as cities or urban areas in modern terms in Korean traditional society. Therefore, this description might apply to the wider spectrum of Korean traditional society beyond the level of village community. We hope that there will emerge from this description a clear idea how complementary but opposite cultural ideologies are accommodated by interacting social strata. To help explain how these cultural ideologies relate to social strata in the village community, we draw upon general implications of the prototypes of social cohesion, which have been proposed by various archaeologists and anthropologists. The general meaning of what makes a group of people a collective body distinguished from others will indicate how the complementary cultural ideologies interact in the socio-spatial field.

In Korean traditional villages, shamanism, Confucianism, and feng-sui may be regarded as the main cultural ideologies which moulded the life of villagers and their space organisation. We will describe these three ideologies as they are related to the social and spatial structure of the villages. The two social spaces lived by two social strata with contrasting cultural ideologies and modes of social cohesion will be explained as the two interacting poles of the socio-spatial field of communication from which the driving forces which shape the village environment emanate.

### 5.1. A GENERAL DESCRIPTION OF KOREAN TRADITIONAL VILLAGES

Seventy percent of the Korean peninsula is mountainous. The monsoon climate brings heavy rain with wind from the south during summer and the cold north wind brings severe winters. More often than not floods sweep away the paddy fields and drought brings heavy damage to crops. Villagers settle themselves at the foot of a hillside on the mild south-facing slope to gain maximum exposure to the sun during the whole year. The hills or mountains at the back of the villages give protection from the cold wind during the winter. This location secures the villages against flood and saves effort in gathering wood from the higher slopes to heat their houses. The sloping area surrounding the villages is cultivated as vegetable gardens. On the level land in front of the villages stretch the paddy fields.

This is an idealised picture of a typical traditional Korean farming village. Since the turn of the century, this picture has been going through a great change under the influence of Western culture. When we deal with the traditional villages in Korea, we usually apply the term tradition narrowly to the culture of the last Chosun dynasty and its remains, which were primarily dominated by Confucian ideology. This is the era in which all the socio-cultural factors of pre-modern Korea converged. We can detect in the villages many deep-rooted factors which go back



beyond this period from folk tales, orally handed-down legends, daily life customs, and also from physical remains. Many of them coincide with the historical records on the periods of the Three-State(57 B.C.-676 A.D.), Unified Silla dynasty(668-935 A.D.) and the Koryo dynasty(918-1392 A.D.). The other cultural factors of former periods were mutated, evolved and transformed into the main characteristics of Korean traditional culture during Chosun dynasty(1392-1910 A.D.).

Natural conditions and the mode of food production(such as wet rice farming) structured the basic skeleton of the physical environment of the village communities. But above all, the forces which caused the villagers to shape their built environments were socio-cultural factors such as shamanism, Confucianism, feng-sui, Buddhism, and Taoism. Through the process of Korean history, these influences changed their patrons alternately between the major social strata. When a new mode of culture was imported and flourished, the previously prevailing ideology moved its seat from the upper social stratum to the lower.<sup>(1)</sup> But the idea that the creative cultural contents passed from the upper, ruling class to the common people, to the folk, can be a far-fetched simplification of cultural phenomena. We can recognise this point in the strong influence of shamanism on Confucians during Chosun dynasty.<sup>(2)</sup> Both strata were eventually considered to be the active agents in the spreading of culture and the exchange of cultural ideas between the two strata was inevitable.<sup>(3)</sup> Though shamanism and the related folk culture dominated the Sang-Min class(lower social stratum) and Confucian ideology was nearly monopolised by the Yang-Ban class(upper social stratum), during the Chosun dynasty, these two distinctive modes of cultural ideology influenced each other.

The following discussion of the socio-cultural factors of Korean traditional villages should not be taken to be the elements of some cause-effect relations in the socio-spatial dialectic in Korean village communities. The arguments are, however, addressed

towards providing the basis for a cultural understanding of the villages which have been surveyed. For, as we argued throughout the thesis so far, the cultural understanding of the community in question is a prerequisite for the investigation of that particular socio-spatial field of communication under the general conceptual scheme of the socio-spatial dialectic.

Throughout Korean history there has been a great deal of contact with China as a result of travels in both directions by students, refugees, monks, traders, soldiers, and diplomats. It seems probable that the decisive models for the development of Korean beliefs and institutions are formal, ideal versions of these embodied in classical Chinese literature and the writings of social philosophers rather than actually observed behaviour patterns.<sup>(4)</sup> Wittfogel<sup>(5)</sup> and Needham<sup>(6)</sup> reveal an excellent understanding of society in the Chinese culture area in their theories of 'Oriental Despotism' and 'Asiatic Bureaucratism', which were mainly drawn from the study of Chinese civilisation and society. We cannot say that the characteristics of Korean culture and society are isomorphic with those of China because Koreans applied the same cultural ideology in their own way. But the fundamental frameworks of their cultures and societies do not diverge greatly. So, except in detail, the theories of Wittfogel and Needham explain the mainstream of Korean society and culture.

Wittfogel defines Oriental despotism by his theory of 'hydraulic society' which is a similar notion to that of Marx and Engels' 'Asiatic mode of production'.<sup>(7)</sup> According to Wittfogel, the production mode of wet rice farming necessitated organised manpower on a large scale and a highly concentrated focus of power to operate irrigation work and flood control. Total power of the rulers prevailed in premodern Asia, and the agromanageial bureaucracy constituted the ruling class under the Asiatic mode of production. In premodern Korea, the whole land of the country belonged exclusively to the state ; only the right of farming was granted to the people and this was not inheritable. The form of

bureaucracy here consisted essentially in the collection of taxes for the centralised state, the royal court and its regiments of bureaucratic officials. The agromanageerial apparatus of the state was fundamentally bureaucratic in character and was operated by non-hereditary elites upon the basis of a large number of partly self-governing peasant communities. Decay in land and tax systems often undermined the base of this bureaucratic apparatus and this caused the successive replacement of one dynasty by another.

Those village communities which had strong connections with important bureaucrats who had reached a high rank in the civil service, became local power bases with their large farmlands. Even when there existed tensions between central government and those local bases, the latter were under the grip of despotic rulers.<sup>(8)</sup> During the Chosun dynasty, the power of ruler was legitimised by Confucian ethics which attributes near absolute patriarchal power to the head of a family. When this principle was extended to the level of the country, the ruler could reign over his people like the head of an enlarged family.

The description of a society only by its materialistic base cannot reveal the whole picture ; the cultural ideologies which sustain the people in a society tell us more about that society. European feudalism was aristocratic and militaristic and this early developed into mercantile and then industrial capitalism. In the Chinese cultural area, however, it was bureaucratic, the basis of which, the mandarinat, was opposed not only to the principle of hereditary aristocratic feudalism but also to the value-systems of the wealthy merchants.<sup>(9)</sup> Beginning with the establishment of a Confucian academy in the Silla period(682 A.D.), education in Korea consisted primarily of Chinese learning, and even during the periods of great Buddhist influence, scholars were trained primarily in Confucian texts.<sup>(10)</sup> The rulers of the Chosun dynasty oppressed Buddhism and adopted the Confucian ideology as a guiding principle of bureaucratic state administration as well as as a norm for human relations and social conventions. The members of the

bureaucracy were selected through state examinations which were based primarily on Confucian texts and the Chinese classics. At some periods and in varying degrees, the entitlement to enter this examination was closed to several categories of people, but on the whole, as far as individuals were concerned, the class was fluid.<sup>(11)</sup>

Scholars, scholar-bureaucrats, and scholar-gentlemen who were preparing to sit for the state examination were most respected, followed by farmers, but merchants and manufacturers who were engaged in material interests were treated contemptuously. Wealth as such was not valued in Confucian ethics because it is not believed to have any spiritual power. It could give comfort but not wisdom, and affluence carried comparatively little prestige in this society. The belief that an educated man can achieve true virtue was wholeheartedly adopted by people, so that the principles of the Confucian doctrine became synonymous with formal norms. The core value of this system, filial piety, was more than an ethical rule. It became a basic articulating principle of the society.

In its ideal form the Korean kinship system is integrated, coherent, and elaborately documented all the way from single households in the village organisations to clans that exist on a national scale and can include more than a million members. The lineage as a Korean cognitive category (Munjung ; Chongjok) does in fact correspond to that of unilinear descent from a common ancestor (and to the rules of exogamy) which is basically patrilineal.<sup>(12)</sup> In the Chinese cultural area, the three nations, China, Korea, and Japan, are socio-culturally on a common ground in that they all have cultural ideologies derived, at least in fact, from Confucianism and Mahayana Buddhism, and they have very similar consanguineous clan systems which are patrilineal. Their family systems are all patriarchal and patrilocal.<sup>(13)</sup> But, from the ways they put emphasis on the inheritance system we can read the differences of social structure which brought about their distinctive cultural patterns. There was no primogeniture in China, so there the

property was divided equally by the inheritors. In Japan the whole of it went only to the eldest son, but in Korea the eldest male could get only a more favourable portion than other inheritors.<sup>(14)</sup>

In Japan, the eldest son organises and finances the routine ceremony of ancestor worship, and the other branch families serve to him as tenants. Someone who had no blood linkage, can obtain the family name to become a branch of the lineage and may often reach to the status of inheritor. The power, in the family, is exclusively centered on the eldest, and the relations between families are less blood bonded and highly hierarchical to enhance the productivity of farming. In other words, all rest of the family members are strictly subjugated to the inheritor (generally the eldest son) when he takes in charge of the family.

In China, the inheritors choose the ancestor worship organiser by lot among them and each one of them contributes equal portions of the expenditure. The eldest of the lineage is usually selected as a representative of the family group without any superior rights or obligations. In Korea, however, the eldest is given a comparatively superior position to the others in inheritance as, more than anything else, he is the successor in superintending ancestor worship. Because of the crucial importance of continuing the family line so that rituals on behalf of lineal antecedents can be properly carried out, the adoption of a close consanguineous relative as an inheritor was fairly frequent when there was no son in the family. If we classify the rights of inheritance in terms of ancestor worship, property, and headship, Koreans placed the emphasis on the first, Chinese on the second, and Japanese on the last. Within the patrilineal kinship system, the Chinese stressed the consanguineous principle and the Japanese stressed the authority principle ; and the Koreans stressed the natal principle.<sup>(15)</sup>

## 5.2. TWO POLES OF SOCIAL COHESION

### 5.2.1. Two Social Spaces

In the bureaucratic society of premodern Korea, the country was administered by a prefectural system, dividing the area by a hierarchy of local governments. The capital of the king dominated intellectual and social life and acted as a focal point for both aspiration and resources. Villages constituted the last unit of this hierarchy. The localities of higher level in the hierarchy derived their prestige and preeminence from bureaucratic rather than cultural or economic factors. This settlement system was devoid of the urban ideology of today. The western conception of the city-state was also totally absent. Towns were purposely created as nodes in the administrative network, though often no doubt they tended to grow out of spontaneous market centres.

There is often said to be in civilizations a great tradition of the 'reflective few', and a little tradition of the largely 'unreflective many'.<sup>(16)</sup> This dichotomy of high and low culture cannot be applied to traditional Korean society in terms of a folk-urban continuum,<sup>(17)</sup> which is typical only of a certain kind of modern industrial environment. In Korea, the 'great' and 'little' traditions existed together in cities, towns, and villages. Great temples and many of the important classical schools, which were supposed to be the cradle of the great tradition, were located in sites remote from urban areas. Men of letters moved back and forth frequently between towns and villages, while classical learning, the arts, religion, and philosophy flourished under thatched roofs as well as behind city walls. The two facets of culture manifested themselves more evidently in the way people of two social strata interacted with each other than in the way they formed contrasting collective living in segregated spaces. The two traditions are interdependent. The great tradition and the little tradition have long affected each other and continue to

do so. They can be thought of as two currents of thought and action, distinguishable, yet ever flowing into and out of each other.

We may call the living world of social strata in which these two complementary cultural ideologies exert their effects, the two poles of the socio-spatial field(see section 4.1.), or simply two social spaces. During the Chosun dynasty there was social stratification into three classes, Yang-Ban, Sang-Min, and Chun-Min. Their duties and rights and roles were demarcated by laws and social customs. Though their relative proportion in the population fluctuated with time, the general trend was to a sharp increase in the population of the Yang-Ban class, a substantial decrease in that of the Sang-Min, and the near abolition of the Chun-Min.<sup>(18)</sup> Chun-Min people could not even use their family name and were either subject to the government as public slaves or possessed by Yang-Ban class families as domestic slaves. They were exempt from all duties and rights as members of the society(as well as as natural men and women). Consequently they could not sustain any independent social space, because they could not take part in any cultural role with their own conscious motivation. Therefore we shall distinguish only two distinct social spaces ; those of the Yang-Ban and the Sang-Min class populations.

The Yang-Ban, the ruling class in the society, held all the privileges in education, access to the bureaucracy, and the ownership of farming rights. The term Yang-Ban originally denotes the two kinds of functionaries in the bureaucratic system ; the literati and officers in the army. But its connotation varies from a common designation for the people of ruling class and scholar gentlemen who pursued Confucian principles and the Chinese classics to indicating those people whose ancestor, no more than four generations before, reached a certain rank in the bureaucracy.<sup>(19)</sup> Because of the essential link with education, which tended to be largely monopolised by the Yang-Ban class, indoctrination in Confucian ethics and the practice of associated ritual and etiquette were far more widespread and intense among the elite

of the Yang-Ban than among the common people of the Sang-Min. But the prestige of this upper-class ideology was so great that it pervaded every level of society in some form or other. On the one hand, the attempt of ambitious element<sup>s</sup> at society's lower levels to pattern their behaviour after that of the Yang-Ban class, helped to spread Confucian ideas and ritual ; on the other, the dominating Yang-Ban class energetically propagated the principle of filial piety, both as a guide to personal ethics and as a way of ordering the state.

Sang-Min class people were the harvesters(as tenant farmer), ordinary soldiers, artisans, and entertainers. Heavy taxes were imposed on their crops and they were recruited for various kinds of public service and collective labour. In principle the state examination for the bureaucracy was open to them, but they could hardly prepare for it because of the difficult circumstances in which they lived. But even though they were deprived of all the privileges in the society, they fostered their own literature, art, religious beliefs, customs, and view of the universe, this forming their own distinctive cultural ideology. Under the domination of the ideology of the Yang-Ban class, they reacted against it, influencing it and being influenced by it. They formed the basic layer of the society. While the ideology of the Yang-Ban class was active as the sunny side of society, that of the Sang-Min class reacted as the shadowy side. The two social spaces were complementary.

These two classes of people constituted two distinctive types of villages called Ban-Chon and Min-Chon.<sup>(20)</sup> The inhabitants of Ban-Chon are composed of consanguineous families of the Yang-Ban class and their subjects and tenant farmers who belong to the lower classes. On the other hand the population of Min-Chon are normally from the Sang-Min and Chun-Min classes. But the consanguineous village does not exactly coincide with Ban-Chon because there existed some consanguineous villages of the lower



classes which were engaged in special occupations such as butchery, craftsmanship, performers, and eunuch servants in the court.

The causes for the foundation of consanguineous villages (Ban-Chon) are diverse, but typically it was as follows.<sup>(21)</sup> When retired from the civil service, the high rank scholar bureaucrat moved back to his home village or settled near the location of the farm land which had been granted to him by the court. There he continued his pursuit of Confucian philosophy or the Chinese classics, while teaching future generations, and sometimes establishing a private school which produced a new generation of scholar bureaucrats. This sometimes grew to be a centre for a particular faction of Confucian philosophy. The offspring of his family line and its branch families formed a community tied by kinship in a village. These kinship family members were considered to be superior to the other members of the village who did not belong to the dominating family line. Ban-Chon villagers were saturated by Confucian ideology in every aspect of their life from private family matters to the public affairs of the village and further afield. Min-Chon villagers on the other hand located themselves near to their tenant farm land. Their family origins were heterogeneous and their social solidarity was promoted more by locality than by blood-tie. Though overshadowed by the Confucian ideology of the Yang-Ban, they always inclined to mythic conventions, shamanistic beliefs, and folk customs related to farming.

Social solidarity made the villagers, whether they belonged to the Sang-Min or the Yang-Ban, exclusive to outsiders and competitive towards neighbouring villagers.<sup>(22)</sup> If a stranger went through a village, he was politely asked his identity. The village as a whole was considered to be the private territory of the villagers. Especially in consanguineous villages, the villagers were so proud of their honoured ancestor and of their achievement in scholarship and bureaucracy that there were rivalries between villages or between branch lineages. They took the blood-tie to

be so important that they felt more familiarity with the people of the same family line from other areas than with members of their own village of different family origin.

Daily necessities were purchased or exchanged in the market which opened every five days. This open market provided the villagers with opportunities for communication. Sometimes peddlers played an important role by supplying products of other regions, going around from village to village. But the villages continued to be largely self-sufficient communities, supplying most of their needs themselves.

For the Ban-Chon villagers, regular ancestor worship ritual for the honoured ancestors of the village was the symbolic event which reminded them that they were linked by bloodties. This was a fundamental relationship between villagers which could not be broken by any artificial means. The extent of the clan organisation for this ritual ranges from the family sphere to the country at large. The medium range mourning group called Dang-Nai, which was composed of four generations, nearly coincided with the village community. This was the common consanguineous group in which the solidarity of members was maintained comparatively strongly because of the nearness in kinship lineage as well as by a common locality. The villages were the ancestor worship communities which originated from a common ancestor.

The villagers cooperated in farming by exchanging labour with each other because irrigation work and paddy field farming needed collective labour in certain periods. They organised various kinds of associations called Kye which were similar to Western guilds. For this they contributed regular fixed amounts of resources. These communal funds were used for expenditure on the occasions of village public events or to subsidise family expenses in ceremonials such as marriage, funerals, and so forth. In times of famine, this system helped families in hardship to continue their living until next harvest or to lighten the burden of tax paying.

Often the consanguineous villages provided the self-governing regulations applied to the villagers, called Hyang-Yak, which were drawn up based upon the principle of Confucian ethics. A committee, which consisted of elders of the consanguineous family line, acted as a jury or an executive body. They dealt with cases and gave verdicts on villagers who committed crimes. To a degree, central authority relied a great deal upon the autonomous functioning of village communities and in general tended to reduce to the minimum its intervention in their life, as long as it could collect a certain amount of taxes paid in kind by them. So the village functioned as a self-governing body with substantial autonomy. It also acted as a self-defence unit against aggressive forces from outside such as oppressive interference by central government or disagreements with other consanguineous groups or other Confucian factions.

#### 5.2.2. Social Cohesion

In Korean traditional villages, the ideologies of high culture and folk culture which nourished the lives of the opposed but complementary social strata, the Yang-Ban and the Sang-Min, interacted as two poles of the socio-spatial field of communication. We can treat the Ban-Chon and Min-Chon as the socio-spatial fields of communication each of which is dominated respectively by one of the two poles of social cohesion. How, then, does each of the poles attract people and make them a collective body of a distinguishable social group?

Anthropological and archaeological studies of the societies of hunter-gatherers and early agriculturalists in the stone age, which are located on the threshold dividing two domains between nature and culture, provide a good basis from which we can induce the fundamental types of social cohesion. The modes of production in those societies, which function to secure the energy resources necessary to maintain the existence of the members of the society and as well the society as a whole, characterise two

distinctive prototypic forms of social organisation. The two societies reveal the essential nature of social cohesion in its pure, primitive state. The modes of production of these societies are sharply differentiated from those of later periods in the ways in which they exploit nature to secure energy.

Archaeologists generally classify prehistoric societies into the two categories of mobile and sedentary economies.<sup>(23)</sup> The mobile economy of a hunter-gatherer society constrains the accumulation of durable wealth whereas the sedentary economy of early agriculturalists is marked by the development of durable wealth. The production unit of a hunter-gatherer society consists of members grouped on voluntary and non-permanent basis to form a band until it develops into a kind of system of household management before it changes into an agriculturalist economy. The point where hunter-gatherers are distinguished from early agriculturalists is the difference in their mode of production. In the way they exploit nature to secure energy resources, nature is the 'subject of labour' for the former and the 'instrument of labour' for the latter.<sup>(24)</sup> Compared with agriculture, where human energy is invested in manipulating nature to produce the products, hunting and gathering do not intervene in the process of production. The diminishing returns from their gathering and hunting within convenient range of stay push the hunter-gatherers to move in search of another locale. Mobility becomes the inevitable response to the requirements of their mode of production and this constrains them to keep the accumulation of utilities at a minimum.

In a band of hunter-gatherers, the social relations between individuals do not depend on institutionalised norms inherited from former generations but are acquired through activity as a member. In the band, the social relationships among individuals are voluntary, non-permanent, and reversible. Meillassoux called this relation that of 'adhesion' according to which individuals are free from inherited hierarchical status or permanent reciprocal obligations defined by filiation norms.<sup>(25)</sup> In contrast to

'adhesive' cohesion in the mobile economy of hunter-gatherer societies, in the sedentary economy of early agricultural societies, social relations between individuals are determined at birth by ties of 'filiation' according to a formal genealogy which stems from their common ancestor and these are defined by the kinship terms in their lineage system. This bond of affiliation is a result of the social response to the domestic mode of production which is supposed to be the prototypic mode of production in societies having a sedentary economy.<sup>(26)</sup>

While Sahlins identifies the household management of production and consumption mainly with the domestic mode of production in early agriculturalist societies, Meillassoux finds the earlier forms of this kind in planting agriculture societies which are supposed to have developed before cereal agriculture.<sup>(27)</sup> The delayed return of the agricultural production process requires continuous, repetitive, and cyclical investments of energy. Those characters of the production process keep people together continuously for a substantial period. As a result, in contrast to band societies, a stable social organisation in agricultural societies develops in the form of household as an autonomous unit for production and social reproduction.

The characters of these two societies, in view of their association with the social cohesion mechanisms of adhesion and filiation, can be interpreted in terms of Durkheim's concepts of mechanical and organic solidarity.<sup>(28)</sup> In hunter-gather band societies, individuals are the permanent core of production in that the association of bands is temporary and immediate. Individuals are totally independent and free without any obligations to any individual or collective body. Devoid of any artificial attachment to culture, they are in the state of nature, associating through mechanical solidarity. On the other hand, in early agricultural societies established upon a domestic mode of production, the primary unit of economic activities is household. In the domestic mode of production, the autonomous unit of social

and material relations, independent of any other household or higher organisation, can be only found in the household. In this sense, households are in the state of nature and mechanical solidarity exists at the level of household organisation.

If we attribute the character of 'the state of nature' to any autonomous core unit of social organisation independent of any reciprocal obligations from the same or higher level organisations, this ideal type of explanation can be applied by extension to wider social groups having an increasing degree of complex social relations. Within domestic groups, individual members of a household are not independent units free of any obligations imparted by social relations. Individuals, here, are not connected through mechanical solidarity but through a kind of organic solidarity based on the sexual division of labour.

By the same token, in the framework of a higher organisation, the household will no more be an autonomous unit of social and material relations against other households within the institutionalised kinship organisation and accordingly each household exists in some sort of organic relation with every other household. Nature/culture oppositions and the corresponding mechanical/organic solidarities are not the absolute categories pointing to a certain society but relative terms associated with part-whole relations in the most general sense. Any parts of a whole tend to try centrifugally to remain as independent entities while the unity of the whole exerts its force centripetally to sustain its coherence. This tension is eased by elevating parts into a unity and in turn the whole becomes a part of another category. In hunter-gatherer band societies, the individual is one and a whole at the same time whereas, in the early agriculturalist societies, an individual is a part of a whole within the household organisation and, on the other, still is oneness of a whole for its own sake.

In Korean traditional villages, every household might be considered as a primary social unit of the domestic mode of production irrespective of its class. Even though the prototypes of social cohesion, adhesion and filiation, have mainly been attributed respectively to the hunter-gatherer societies and early agricultural societies, we might extend the general implications of those types of cohesion to gain an understanding of social cohesion in Korean traditional villages. We might regard adhesion and filiation not as the types of cohesion attributable to particular societies but as two complementary facets of social cohesion operating everywhere in every society. Understood as an archetype of social cohesion, adhesion implies the condition whereby the primary social unit at the level of social organisation under consideration does not have reciprocal obligations to others of its kind outside the objectives of that association. Here, the relationship between primary social units is not permanent but is reversible and voluntary. For filiation, the relationships between primary social units are subject to institutionalised norms defined by the reciprocal obligations among these units.

In so far as these two types of cohesion interact at every level of social organisation, the character of a society might be determined by the degree to which the community is orientated to each facet of the social cohesion. In Korean traditional villages, people of the Sang-Min, whether they live in the Min-Chon or Ban-Chon, who are strongly directed by the folk cultural ideology, aggregate into social groups largely by adhesive association. On the other hand, people of Yang-Ban in the Ban-Chon are bound into social groups mainly by the filiation of kinship ties. Adhesion is attached more or less near to the domain of nature with the minimum articulation of mediated social norms in its manner of simple and non-permanent association. Filiation connotes more the cultural elaboration in its manner of ties by social norms and cultural conventions, whether the mode of filiation be kinship systems, hierarchical systems of government, or vocational associations of interest groups. In terms of

the part-whole relation, for the adhesive association, the primary social units as wholes in themselves and as parts of the social organisation are juxtaposed with equality in its horizontal extension. By contrast, the primary social units of affiliative social groups are vertically tied with reciprocal obligations of differentiated weights. Here, social organisations at a lower level are affiliated into another higher organisational whole by the relations of containment. We may consider adhesion as the horizontal dimension of social cohesion and filiation as the vertical dimension.

### 5.3. THE CULTURAL IDEOLOGIES OF KOREAN TRADITIONAL VILLAGES

There are three cultural ideologies which moulded much of the villagers' daily life and influenced the ways they ordered their life space. These three ideologies, namely shamanism, Confucianism, and feng-sui did not have strong religious overtones but rather played a role as guiding principles by which villagers understood the relation of their living world with the outer world beyond, defined social relations, organised their daily businesses, and shaped their living environment. Even though there are a lot of believers in Buddhism amongst villagers, Buddhism does not have substantial effects as a collective ideology on the life of the traditional village community. Taoism is also more or less remote idea for the villagers perhaps except for its indirect influences through Confucian ideology which was in turn influenced by Taoist metaphysics.

#### 5.3.1. Shamanism

The mythology of the foundation of Korea says that the founder was a shaman. In that period, the head of a tribal society acted both as the ruler of the community and as the shamanic priest. Shamanism is believed to have been the first folk religion in Korea. It was transmitted to Korean tribal society from Central Asia. According to Eliade, shamanism is pre-eminently a religious



phenomenon of Siberia and North and Central Asia.<sup>(29)</sup> Let us follow Eliade's description of the shaman. Though a shaman is a magician, not every magician can properly be termed a shaman. Every medicine man is a healer, but the shaman employs a method that is his and his alone. As for the shamanic techniques of ecstasy, any ecstatic cannot be considered a shaman. The shaman specialises in a trance during which his soul is believed to leave his body and ascend to the sky or descend to the underworld. The shaman differs from a possessed person in that the shaman controls his spirits, in the sense that he is able to communicate with the dead, demons, and nature spirits, without thereby becoming their instrument. The shaman is a specialist of the sacred, who can use his ecstatic experience for the benefit of community people. They are the elect, and as such they have access to a region of the sacred inaccessible to other members of the community.

After the transmission of Buddhism and Confucianism into Korea around the 4th c. A.D. from China, which gave rise to a new bureaucratic system of the state and a basis of ethics, shamanism began to become the religion of the common people.<sup>(30)</sup> But through the successive dynasties, it continued to be, even in a modified form influenced by Buddhism, Taoism, and Confucianism, a norm for the state rituals as well as for the religious practices of the common people. When Buddhism moved its seat from the upper class to the common people, during the Chosun dynasty, shamanism, oppressed by Confucian ideology, received much influence from Buddhism. It even brought in many facets of ritual procedure from Confucianism. Against the monopoly of the upper class on the Confucian ideology in the villages, the people of the lower classes remained inclined towards folk religions like animism, shamanism, or to mutations of them and the mainstream of folk religion for the Sang-Min people continued to be shamanistic. The village festivals, of which most are shamanic, show the solidarity of the Sang-Min and of their own cultural ideology, distinguishing from that of the dominating Yang-Ban. These are launched regularly every year by the villagers, especially by the Sang-Min, who beg

their gods to ensure a good harvest, the happiness of the villagers, and safety from evil, illness and disaster.<sup>(31)</sup> They elect a manager of the prayer for the festival from amongst themselves and collect the expenses for themselves. In connection with the festival, they organise meetings of Sang-Min class villagers, in which communal matters are discussed and decided. This festival functions independently, and is apart from the rule of the dominating class. It provides the Sang-Min with occasions of association for common prayer, entertainment, and conference.

There are sacred places in the villages where the shamanic ceremony is staged during the festival. These exist in the form of cosmic trees, sacred pillars, and sanctuary houses or sometimes sacred mountains. In archaic and traditional societies, the surrounding world is conceived as a microcosm. Every microcosm, every inhabited region, has what may be called a 'Centre' where the sacred manifests itself in its totality.<sup>(32)</sup> In the conception of mythical geography, this centre is the essentially real space, for in the archaic world the myth alone is real. It is the sacred space in which one has direct contact with the sacred. These cosmic trees, pillars, sanctuary houses, and sacred mountains are the axes mundi where the three cosmic regions — those of Heaven, Earth and Hell — intersect.<sup>(33)</sup> The pre-eminently shamanic technique is the passage from one cosmic region to another. The shaman knows the mystery of the breakthrough from one plane to another.<sup>(34)</sup>

Taboos, which affected the shaping of the physical environment prevailed in the villages. Some of these forbade the villagers from drilling wells for drinking water. Or in one village, the villagers had to construct the roofs of their houses in a particular shape. Usually these taboos were connected with their interpretation of the morphological form of the villages. For example, in Seommaeul and Yangdong (the surveyed villages), where the form of the village was identified with that of a ship, the activity of digging wells in the village was regarded dangerous because it would lead to the village sinking or, in Yangdong, the construction

of roofs should be of a shape similar to a ship upside down. Villages have an age-old sacred tree, a group of trees, or totemic pillars at the entry to the village. Villagers believed that these prevent the village from attack by evil ghosts or demons. At the limit of the village begins the domain of the unknown world, of the formless. On this side there is ordered space which is inhabited and organised ; on the other, outside this familiar space, there is the unknown and dangerous region of the demons, the ghosts, the dead and foreigners — in a word, chaos.

### 5.3.2. Confucianism

We can differentiate the influences of Confucian ideology in shaping the socio-spatial field of Korean traditional villages into three levels : Confucian ideology as a guiding principle of the society as a whole, the kinship lineage system and filial piety which dominated the life of Ban-Chon villagers, and family structure and norms of etiquette in family life.

With the growing importance of Confucian ideology as a social norm in the Koryo dynasty, the scholar bureaucrats who were mainly from the small and medium landowner and yeoman classes based on village communities, grew in number and influence. When the bureaucratic system, which relied upon open examination, was expanded during the Chosun dynasty, scholar bureaucrats and scholar gentlemen formed a stable dominating class.<sup>(35)</sup> They established private classical schools at their home villages and there they taught the young generations and produced many scholar bureaucrats, forming a society of scholar gentlemen. This circle of scholar gentlemen called Sa-Rim acted as a counter force against central government with its knowledge and its activity to criticise state policies and social problems. They were the actual operators of the village autonomic rule(Hyang-Yak), which was drafted on the principle of Confucian ethics to meet the circumstances of the villages. Ban-Chon villages formed the power base of scholar

gentlemen of the Yang-Ban class who were cultivated by Confucian ideology and were determined to spread it in society.

Filial piety, for the alive as well as for the dead, was one of the most important values to which villagers devoted themselves. The kinship lineage system was strict and every name of the lineage from the same ancestor was kept in a lineage book. Ancestor worship rituals, especially in Ban-Chon villages, were the primary communal events among the members of each blood-bonded kinship group. During the period of this ritual, common concerns of the kinship group were discussed and resolutions were made. Through these regular ceremonies Ban-Chon villagers could maintain their kinship solidarity. They could carry on the rituals year by year because they contrived to raise the expenses from the inherited communal property allocated for this purpose. The head family house of the lineage and the branch head houses occupied more prestigious sites in the village compared with other families. These are usually the oldest residences in the village and they surpass other houses in dimension and qualities of construction. There are also separate pavilions which could be utilised for communal events of the lineage and for entertaining guests. These houses also contain a separate room or building to enshrine the souls of dead ancestors of the main lineage.

In a Ban-Chon village, the allocation of the site of a residence took into account the lineage system. In the case of a plain site, the dwelling of the lower members of the lineage avoided screening the view from those of the higher. In a mountainous area, the juniors of the lineage settled at the lower sites. Monuments were erected at the entry to the village to commemorate villagers who had shown outstanding filial piety during their lives, or given firm loyalty to the king. These were aimed at encouraging the villagers to commit themselves to Confucian ethics.

At the household level, Confucianism affected the spatial pattern of traditional houses by its influence on the traditional family

structure and formal etiquette. The Yang-Ban also adopted many ideas from the residential quarters of the palace through its experience of bureaucratic service in the court. When this type dispersed to other regions, it still maintained the basic spatial organisation despite varying local conditions. The ideology of high culture overcame the special requirements of varying localities.

A substantial portion of floor space (called the Ma-Ru) in Yang-Ban residences, was allocated for the diverse rituals which the normal family etiquette required. Separate structures or spaces were allocated, within the house compound, for the souls of bequeathed ancestors which were symbolised by their name plates. In this way the family continued to live together with their ancestors even after their death. The living spaces of lower class subjects were strictly distinguished from others in the residence. Spaces for them were arranged at the front boundary of the compound. Also, spatial separation between sexes was distinctive indoors as well as outdoors. Spaces for females were, especially in Yang-Ban house compounds, placed in the deep inner part of the compound and protected against direct access from outside.

Walls surrounded the house compound and divided outdoor spaces in the compound. Walls also separated sexes, classes, and the inside and outside worlds. The means of division was not, however, completely physical. Privacy and the separation of space were as much guaranteed by social norms as by material barriers. Walls existed for the purpose of defence and territorial demarcation but they were as much a symbolic gesture which implied the establishment of an ordered microcosm. It was also believed that walls confined Chhi (see sections 4.2.1. & 5.3.3.) within the compound.

In its ideal form, the Yang-Ban family, especially that of the head of the lineage or a branch head, consisted of from three to five generations living together in a house compound. A Sang-Min

family could not follow this model of an extended family because of their economic and social conditions. Their house could only accommodate the basic minimum functions for a simple family life. There were not much opportunity for them to articulate in shaping their living environment in view of their life and the resources available. The spatial pattern of Sang-Min houses evolved through a long process of adaptation to natural environmental conditions and to special local requirements. So the spatial organisation of house compounds varied from region to region while accommodating only limited functions with minimum spatial dimensions compared with Yang-Ban houses. The two types of residence of the two classes influenced each other in their process of development, though that of the Yang-Ban was more strongly influenced by the Confucian norms whereas that of the Sang-Min was largely overruled by local conditions.

### 5.3.3. Feng-sui

The Buddhist monk Do-Sun is believed to have been the first authority of feng-sui in Korea. His knowledge of feng-sui was thoroughly applied in establishing a new capital for the Koryo dynasty in the 10th c.. Feng-sui is believed to have reached the Korean peninsula from China when Taoism and Confucianism were imported.<sup>(36)</sup> Feng-sui can be regarded as a pseudo-science. Its system of logic is too articulate to be considered as a mere mythism. It is a norm for building for the alive and burying the dead based on the model of the Universe which originates from the Chinese philosophy of Yin-Yang and the Five Elements. Although the cosmology of Yin-Yang and the Five Elements no doubt had deep rooted influences in every aspect of the villagers' life from the dating of child birth, match-making, naming, farming, the calendar, arranging funerals, to medicine and planting, we shall concentrate on feng-sui which thoroughly adopted these principles. Among other things, feng-sui is the most evident manifestation of these cosmological principles applied to shaping the living environment. The 'Li ki' tells us the right way of doing things in harmony with

the order in nature and society.<sup>(37)</sup> According to this, if anyone is in the right place facing the right direction doing the right thing at the right time, he would not avoid being both practically efficient and ritually correct. This was the ideal pattern of doing things in traditional Chinese culture. Burying and building in the right place and at the right time is being in tune with the universe. Instead of exploiting or conquering the natural environment, by harmonising their existence with nature people tried to be on good terms with the order of the Universe. By adapting the residences of the living and the dead so as to cooperate and harmonise with the local currents of the cosmic breath(Chhi), they believed that the inhabitants in the environment and the following generations of the buried could lead a happy life without disaster.

Feng-sui was adopted at every level of environmental planning for both the alive and the dead, from establishing the capital city of a dynasty, building palaces and temples, and locating a village, to building a residence, choosing the relative position of spaces in a house and siting graves. Feng-sui is divided into two branches : yang-dwelling feng-sui for the alive and yin-dwelling feng-sui for the dead. The graveyard was regarded as a village for the dead ancestors. Filial piety was expressed in arranging the graves in a clan communal graveyard using the same principles as those applied in locating dwellings for the living. The highest rank in the lineage was buried in the highest place and his next senior was placed on the left at the same height. Combined with ancestor worship, yin-dwelling feng-sui was widely practiced. Consanguineous groups were eager to acquire the best places to bury their ancestors. This competition between kinship groups resulted in many cases of conflict and disorder.

Yin-dwelling and yang-dwelling feng-sui have no differences in principle.<sup>(38)</sup> The only difference is the scale of microcosm in which these are applied. Feng-sui is a system of finding a right place by analysing the surrounding topography. The metaphysics of

it is composed of Yin-Yang and Five Elements theory. This cosmology is arranged systematically in the I Ching but their origins have not yet been well defined.<sup>(39)</sup> For the practice of feng-sui, the cosmology is elaborately organised on the geomancer's compass called Lo-Ban. During the Thang time(618 A.D.- 907 A.D.) the Confucians began to feel acutely the lack of a cosmology to oppose that of the Taoist, and a metaphysics to compete with that of Buddhists. They brought the confucian philosophy into close relationship with a reasoned theory of the Universe, borrowing various elements from the other two schools and from the Naturalist cosmology.<sup>(40)</sup> When Confucians formulated their own naturalist philosophy, feng-sui is supposed to have developed through its influence to a more sophisticated level. At the same time more Confucians came to be interested in feng-sui and involved in its practice.

The use of feng-sui was more widely spread among the Yang-Ban than the Sang-Min. This was not because feng-sui was antagonistic to the beliefs of the Sang-Min but because their socio-economic circumstances were not favourable for them to apply it as much as they would have liked. Insofar as feng-sui is not a religion, the geomancers are not mediators between this world and the other like shamans ; the power of their instructions and of their clients rest on a genuine belief that the basic metaphysics of feng-sui is behind all natural and cosmic events and that human lives are subject to them.

'Earth has its place at the centre and is the rich soil of Heaven. Earth is that which brings the Five Elements and four seasons together. Thus earth is the controller of the five elements, and its Chhi is their unifying principle'.<sup>(41)</sup> In feng-sui, it is believed that all the different places on earth have their characteristic density of Chhi.<sup>(42)</sup> The place of a microcosm where this Chhi is stored densely is called 'Hyul'. The Hyul must be juxtaposed with a plain broad space called Myung-Dang in front of it. This Hyul needs to be surrounded by



characteristic mountains, which are compared to dragons, in four directions to prevent Chhi from draining away. But, at the front of the Hyul, the mountain can be replaced by a stream. This theory is called Sa-Ron. When these concepts of Hyul and Sa are combined, these give birth to a theory of the microcosm, called Kook-Ron, which explains the topographic relations of an area which are necessary for containing Chhi.

In the case of yin-dwelling feng-sui, the real practice of it tended to concentrate on luck for the descendants. But we have to distinguish the true meaning(or Tao) of feng-sui from its rather muted utilitarian tendencies. Though the basic cosmology of feng-sui was derived from the Naturalist philosophy(Yin-Yang, Five Elements) which is amoral, natural, and non-religious, in its more developed stage after the Neo-Confucians, it was fused with ethics and anthropomorphic concepts. At this stage, feng-sui cosmology includes the conception of the interaction between Heaven, Man, and Earth.<sup>(43)</sup> Even if we can diagnose a right place by Ti li(Law of Earth), Tien li(Law of Heaven) can cause a stream on the site to change course. Without virtue the most propitious ground is doomed to impotence and inactivity because of the refusal of Tien li to cooperate. It is Tien li which, moved by the virtues of the persons in question, compells the Ti li to set to work in their favour with all its energy.<sup>(44)</sup> Human virtues came to be believed to affect the end product of feng-sui practice. Chhi, in this sense, includes the notion of human values and moral aspects when it is applied to feng-sui. The popularity of yin-dwelling feng-sui is connected therefore with Confucian ethics, those of filial piety and ancestor worship.

Feng-sui is this-worldly in that it has no religious aspects ; but the utilitarian tendency of feng-sui cannot be connected with a principal characteristic<sup>(45)</sup> nor can feng-sui be designated exclusively natural as against social as Feuchtwang suggests<sup>(46)</sup> because the cosmic order of the Universe manifests itself in human affairs as it does in Nature. In the Neo-Confucian view,

'the nature of the universe is, in a sense, moral, not because there exists, somewhere outside space and time, a moral personal deity directing it all, but because the universe has the property of bringing to birth moral values and moral behaviour when that level of organisation has been reached at which it is possible that they should manifest themselves'.<sup>(47)</sup>

#### 5.4. CONCLUSION

If any Korean traditional village is to be understood within the conceptual framework of the socio-spatial dialectic, it can be regarded as a socio-spatial field of communication where the two interacting poles of cultural ideology, namely those of folk and high culture, are represented by shamanism and Confucianism respectively. These two poles are the origins of the social cohesion holding people into two complementary social spaces : the Sang-Min and the Yang-Ban. Sang-Min people are associated by the adhesion through their neighbourliness and shared labour in farming, while Yang-Ban people are tied by kinship affiliation. There is no absolute threshold demarcating complementary cultural ideologies in different social strata, but in Korean traditional villages, shamanism was mainly the source of the cultural ideology of the Sang-Min and Confucianism that of the Yang-Ban.

From the point of view of Confucian ideology, the shamanic world view might appear to be irrational or crude. But, from the point of view of the folk culture ideology of shamanism, the Confucian world outlook is rational only in the sense that it rigidly follows social norms based on it at whatever costs. For the Yang-Ban people of the high culture ideology, the distinctions between sexes, senior and junior, and social classes were essential for their space organisation. Even the arrangement of tombs in their clan graveyard was carried out by carefully considering the order of kinship lineage and feng-sui model. For the Yang-Ban people, the consideration of social categories overrules that of functional categories in their space organisation. Functional categories

have meaning to them only when these are subservient to social categories sanctioned by their cultural ideology. On the other hand, for the Sang-Min people, there were few obstructions to preferring the consideration of functional categories to these of social categories. This does not necessarily imply that the space organisation of the Yang-Ban people is not functional or the Sang-Min people were totally unaware of the necessity of properly ordering social categories in their building activities. But, when they were obliged to choose between conflicting considerations, people of the high culture ideology rarely sacrificed social norms over functional considerations while people of the folk culture ideology stuck to the functional options presented by natural local conditions.

The ideology of the high culture tends to adopt the elaboration of artificial conventions. It pretends to be more sophisticated at the price of distancing itself from nature, and subordinates the folk cultural ideology as primitive. The folk cultural ideology is always more intimate with the domain of nature and poised against its counterpart, the high cultural ideology. As we argued in section 5.3.1., with reference to the history of Korean society, a cultural ideology recedes from the place in the high culture when facing a new system of values adopted by the dominating social group. This phenomenon is now happening in a different disguise in Korean villages. This time, whether they be the Ban-Chon or Min-Chon, Korean traditional village communities as a whole are being subjugated as the seat of folk culture ideologies against the high culture ideologies of urban areas.

This seems to indicate that the folk/high culture division goes parallel with the distinction of social cohesion into those of adhesion and filiation(see section 5.2.2.). In Korean traditional villages, the affiliative social ties of the kinship system, which have been the stronghold of the high culture ideology, are now being transformed into ones of adhesive social association. The kinship ties which once strongly imposed strict reciprocal obligations on

its members are becoming loose. People's life has become more involved with multiple social organisations from modern corporations to varied interest groups. As kinship ties are becoming less binding, the kinship related events are decreasing and gatherings have become formalised without any real attachment to people's life as a whole. People sticking to their ties of kinship lineage are regarded as living under the folk cultural ideology. Instead, the reciprocal obligations linked to private or governmental corporations and interest groups now have a strong influence on people's life and their social relations. Prestige gained through involvements in new social organisations have emerged as advantages in social life. Value systems and life patterns adapted to these new social associations increasingly strongly define social relations and these new codes of social relations are becoming institutionalised visibly and invisibly. These emerging social relations are taking over the affiliative power of social cohesion from the kinship based society of the traditional villages. At the same time, it turns out to be the case that villagers, whether from the Min-Chon or Ban-Chon villages, are no more the holders of the high cultural ideology.

The understanding of Korean traditional villages as a socio-spatial field of communication, in which two complementary but opposite forces of social cohesion, in conjunction with their associated cultural ideologies, make two interacting poles, will help us in analysing and interpreting the surveyed villages in the remaining chapters.

## CHAPTER 6. THE NETWORK OF TOPOLOGICAL RELATIONS

### 6.0. INTRODUCTION

In the previous chapter, a general description of Korean traditional villages was given by representing the village community as a socio-spatial field of communication which is evolved through the two complementary interacting poles. For the cultural understanding required in representing the house compounds by networks of individual regions in the next chapter, we present in this chapter a description of four surveyed villages. The description follows the framework achieved in the previous chapter. A note on the survey procedures and some details of the survey materials used in this thesis are given in Appendix I together with plans of house compounds.

For the conversion of house compounds into analysable objects, we need to clarify what aspects of this process are essential and manageable. We concentrate here on the topological relations of individual regions as they are set for energy-information transactions in the socio-spatial field of communication. Before these relations are represented by graphs in the next chapter, some important issues concerning the use of abstract languages, especially regarding physicalism, are discussed. Also, the concept of experimentation, as it is used in this thesis, is clarified. In the process of experimentation, the concept of energy-information, which has been introduced as the core substance of the socio-spatial dialectic, calls for a concrete definition beyond its more general abstract implications. The subjects discussed in this chapter prepare the way for the graph-theoretic representation of the socio-spatial field of communication which will be dealt with in the next chapter.

## 6.1. FOUR VILLAGES

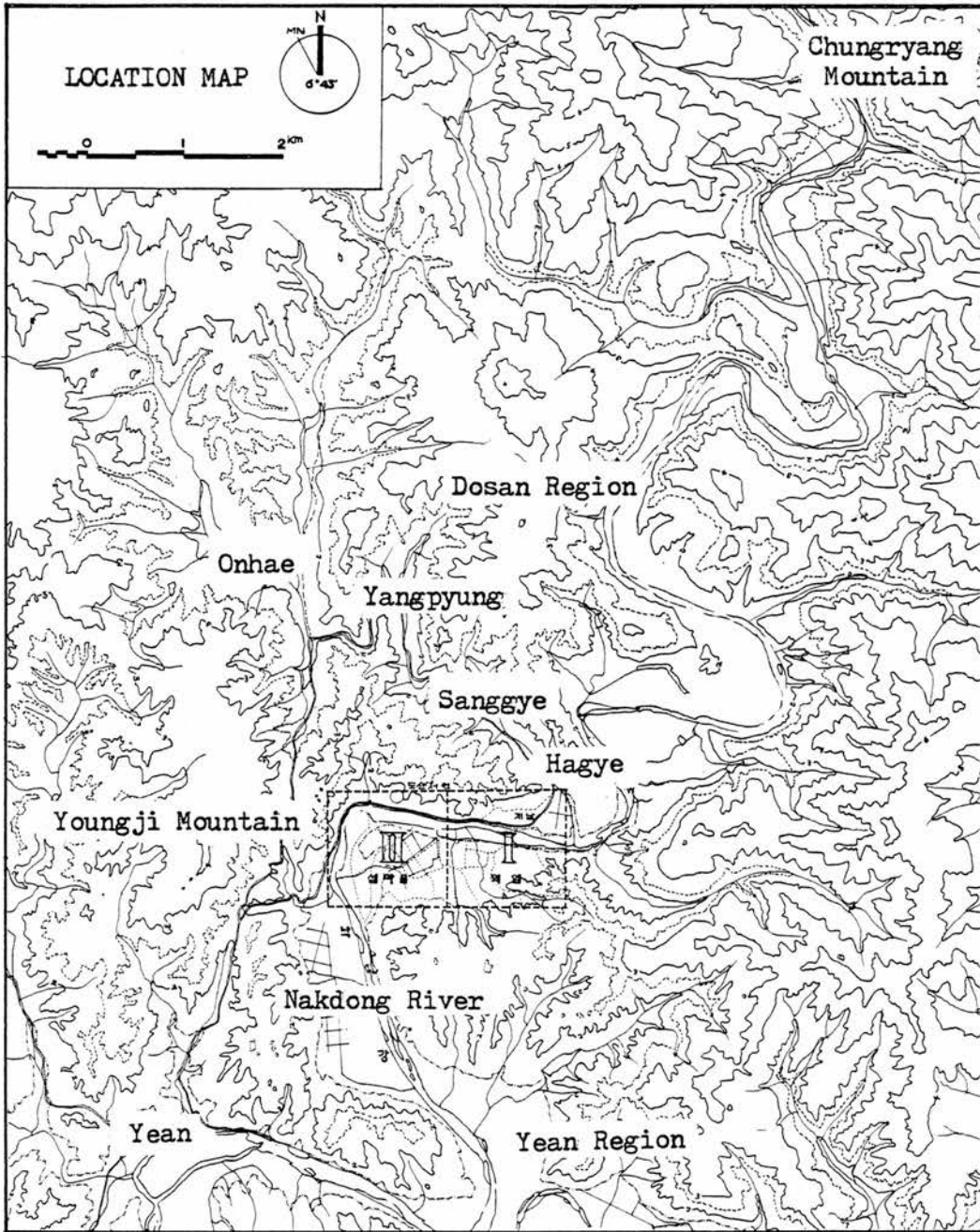
The socio-spatial phenomenon is a complex process where there are no clear cut divisions and separations. But, to make the study of it more manageable, it is preferable to break it down into three levels according to the degree of complexity. At the micro level, it deals with simple socio-spatial phenomena where only the simple social process and its spatial counterpart are involved in such cases as family structure and its domestic environment. At the macro level, the heterogeneous aspects of it come to the fore, where different social groups and their environments are intermingled and juxtaposed as in urban communities. At a level in between, our study focuses on relatively homogeneous socio-spatial phenomena where a sufficient number of simple socio-spatial processes are included. At this stage, when socio-spatial study is not well developed, we need to concentrate on the micro and middle levels. We can draw the explanatory models more easily at these levels, because here there are fewer variables. As complex communities are rather hard to isolate from external influences and as they are often undergoing rapid cultural changes, it would be appropriate to start with small and isolated communities such as traditional villages or modern shanty towns for an approach to the study of socio-spatial dialectic.

For the networks as objects to maintain logical consistency through the process of subjective interpretation from by reading plans to the interpretation of these in terms of the socio-spatial dialectic, it is necessary that the survey data possess homogeneous properties in both their functional and social categories. The surveyed villages consist of organic collections of domestic buildings which have remained comparatively intact, shielded from outside influences for a substantial period of time. The villagers also could be said to have remained in a traditional society in that the socio-cultural background and economic basis of every household remains strongly attached to long established ways, although change and adaptation are now taking place. As a

result, established norms of using the physical environment by people in the community can be considered to hold to some normalised pattern. The people's life and the spatial organisation which contains it are intact enough to reveal the undisguised meaning of the socio-spatial entity in this socio-spatial field of communication. A traditional society provides more homogeneous data for the study of the socio-spatial dialectic and here the detection of the encounter between space and society is more readily susceptible to enquiry.

Of the four surveyed villages, Euin and Seommaeul are located side by side in the same area in Andong region of Kyungsang-bukdo province as shown in figs. 6-1 and 6-2. Each village has physical distinctions of its own and different social compositions which distinguish the two villages as separate but interrelated entities. Later on the symbols E and SE will be used to refer to each village together with the household numbers when dealing with their house compounds. Euin village was first settled by the second grandson of Lee Toi-Gye who was an eminent Confucianist scholar-bureaucrat during the Josun dynasty. Thereafter descendants of the family line prospered in that area, forming a consanguineous clan village. The population of Seommaeul mainly consists of tenant farmers who are dependent on the land possessed by Euin villagers or by the Do-San Confucian Academy which was founded by Lee Toi-Gye and is located on the hill facing Seommaeul across the stream fringing the village. Also some servant families related to Euin or the Academy and several households from the Lee clan family line are among the inhabitants. Unfortunately, most parts of both villages were submerged under the water level with the completion of Andong Dam built in 1976 for agricultural irrigation in the region.

Lee clan households make up about three-quarters of the 39 households in Euin and about one quarter of the 63 households in Seommaeul. Members of Lee clan living in Seommaeul are late settlers in the village and it is basically a Min-Chon from the

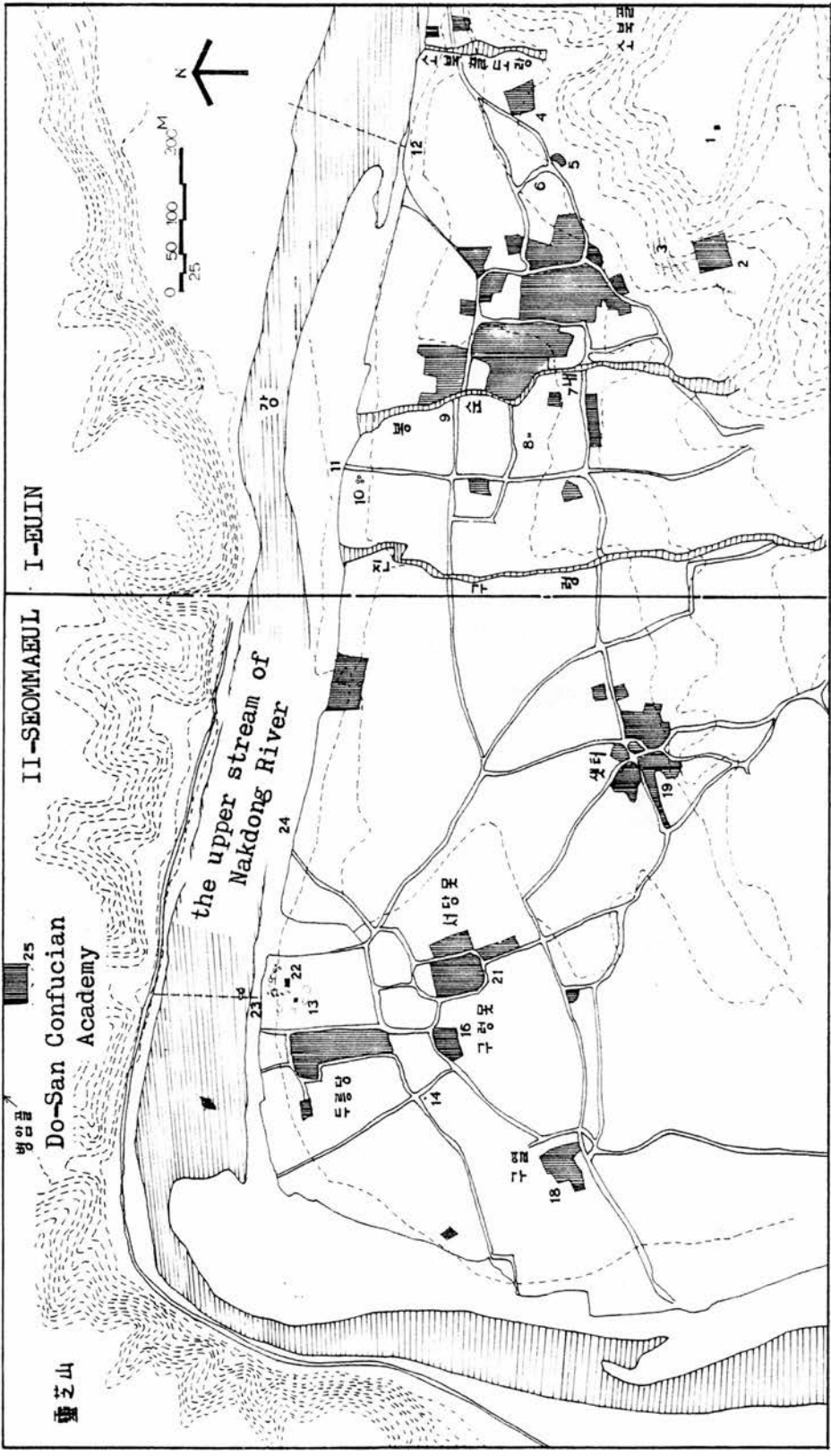


I : Euin

II : Seommaeul

Fig. 6-1. The location map of Euin and Seommaeul.







-  : Built-up area
-  : River and stream

Fig. 6-2. The site map of Euin and Seommaeul.

point of view of its origin and social constitution. More often than not, members of Lee clan living in Euin do not regard the clan members of Seommaeul as full members of their clan on the grounds that they are descendants of an illegitimate son of Lee Toi-Gye's eldest grandson. On the other hand, Euin is a typical Ban-Chon in every sense as described in chapter 5. From the fact that people call Seommaeul the lower village and Euin the upper village, we can detect how people are conscious of the social distinction between the villages.

The other two villages, Yangdong and Sopyung, are located in the Wolsung region of the same province as the above villages (fig. 6-3). Later on the symbols Y and SO will be used to refer to each of these two villages together with the household numbers when dealing with their house compounds. In Yangdong, house compounds are scattered in groups on steep hills and in narrow valeys(see figs. 6-4 & 6-5). The Yangdong village consists of 89 households from the Lee clan, 20 households from the Son clan, and 39 households of diverse origin. Though the history of the village goes further back, the Son family first settled in this village during the 15th century. Towards the beginning of 16th century, a woman of the Son family married a man from the Lee family to settle in the village. The couple gave birth to a future eminent Confucian scholar-bureaucrat, Lee Uhn-Jeok, resulting in the prospering of the Lee family in the village. Yangdong has been dominated by the two clan families and contains households of non-clan members who are servants or tenant farmers.

Sopyung village is located in the middle of the paddy fields in front of the hills of Yangdong village(see figs. 6-3 & 6-6). It was founded by some non-clan member families liberated from their dependent state upon clan families of Yangdong in the wake of the reformation, of the 1930's, of the then traditional class relations of society in Korea. Thereafter it had grown to include 49 households at the time of survey. With increased social mobility, there are now few households remaining in the village

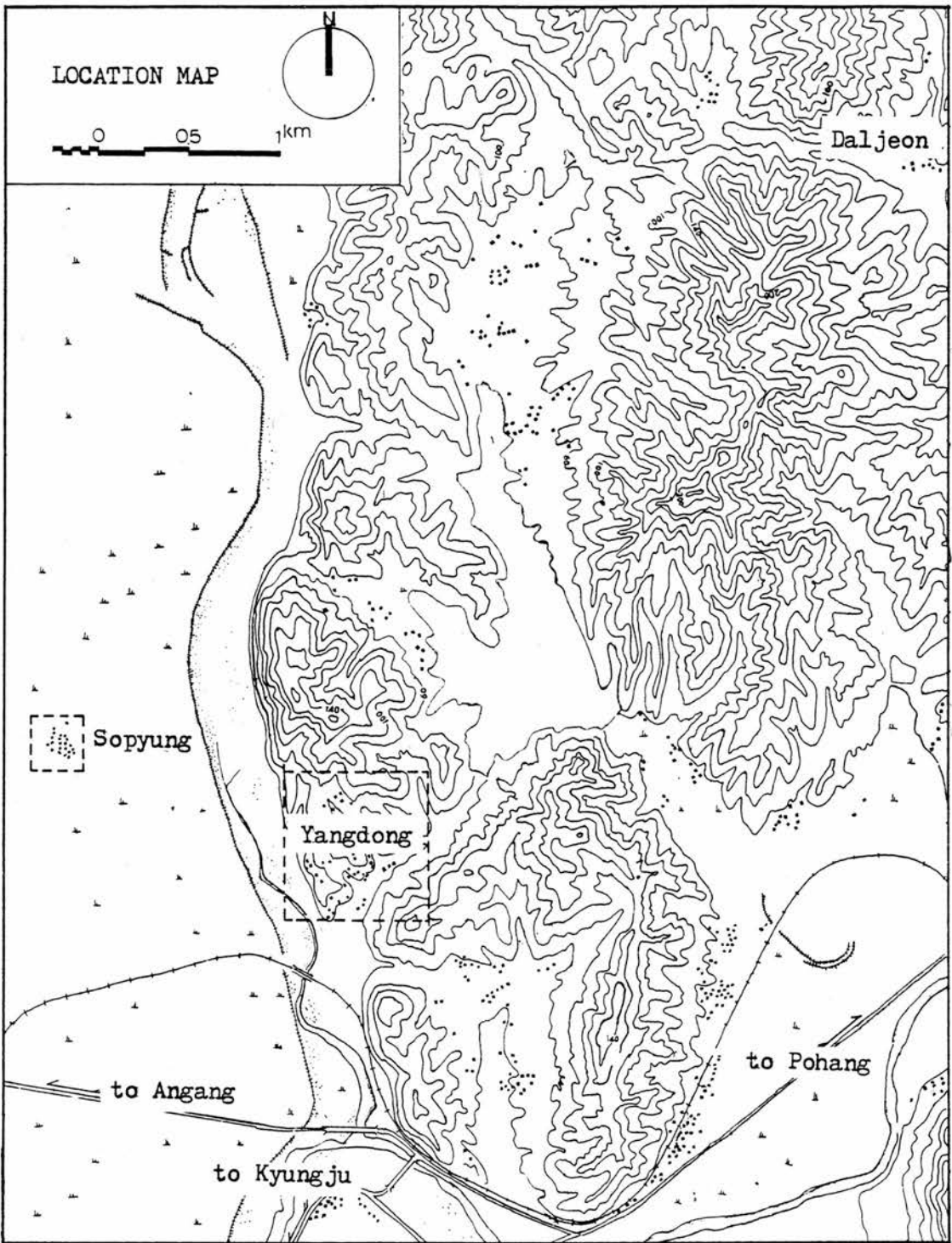


Fig. 6-3. The location map of Yangdong and Sopyung.

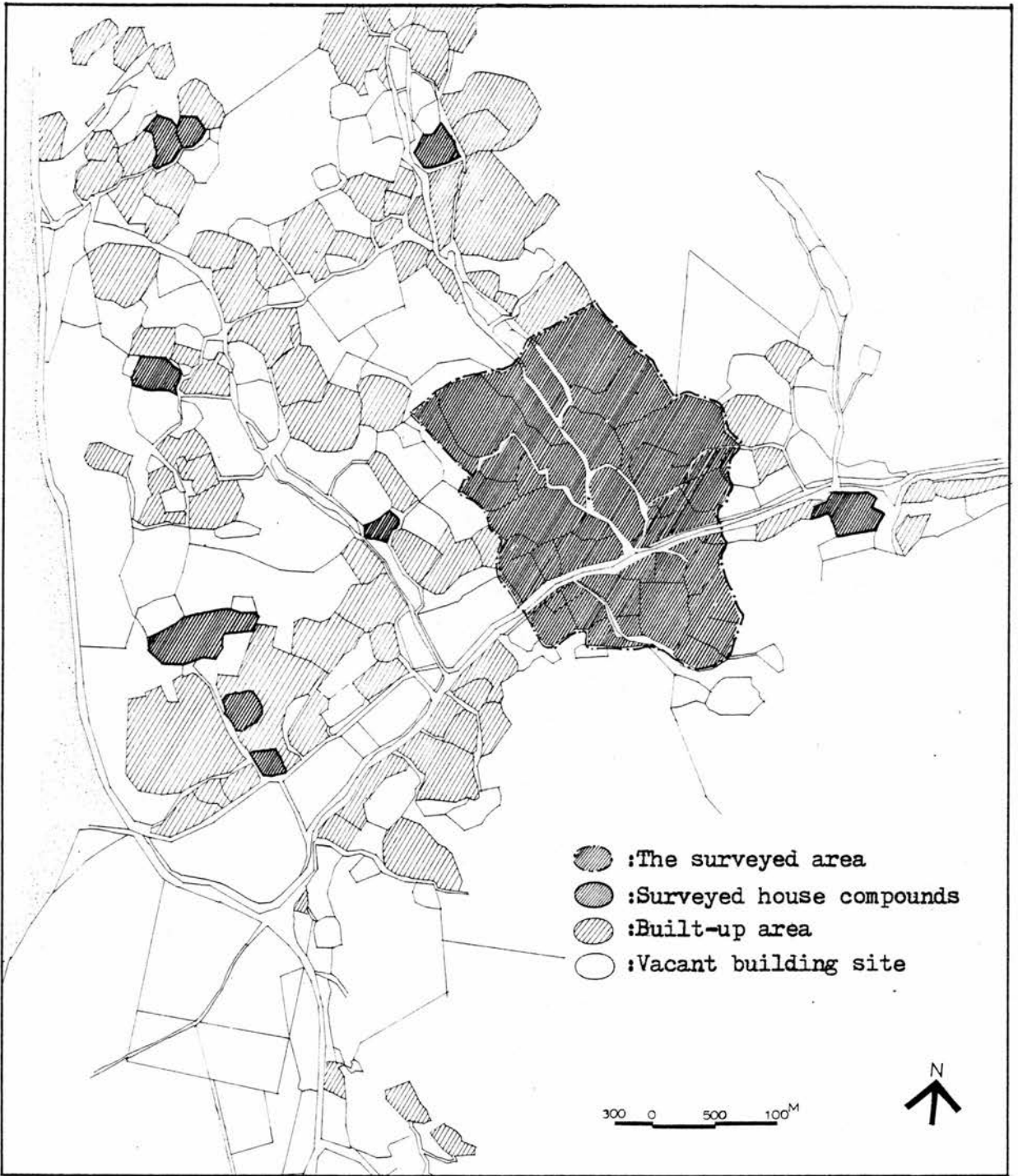
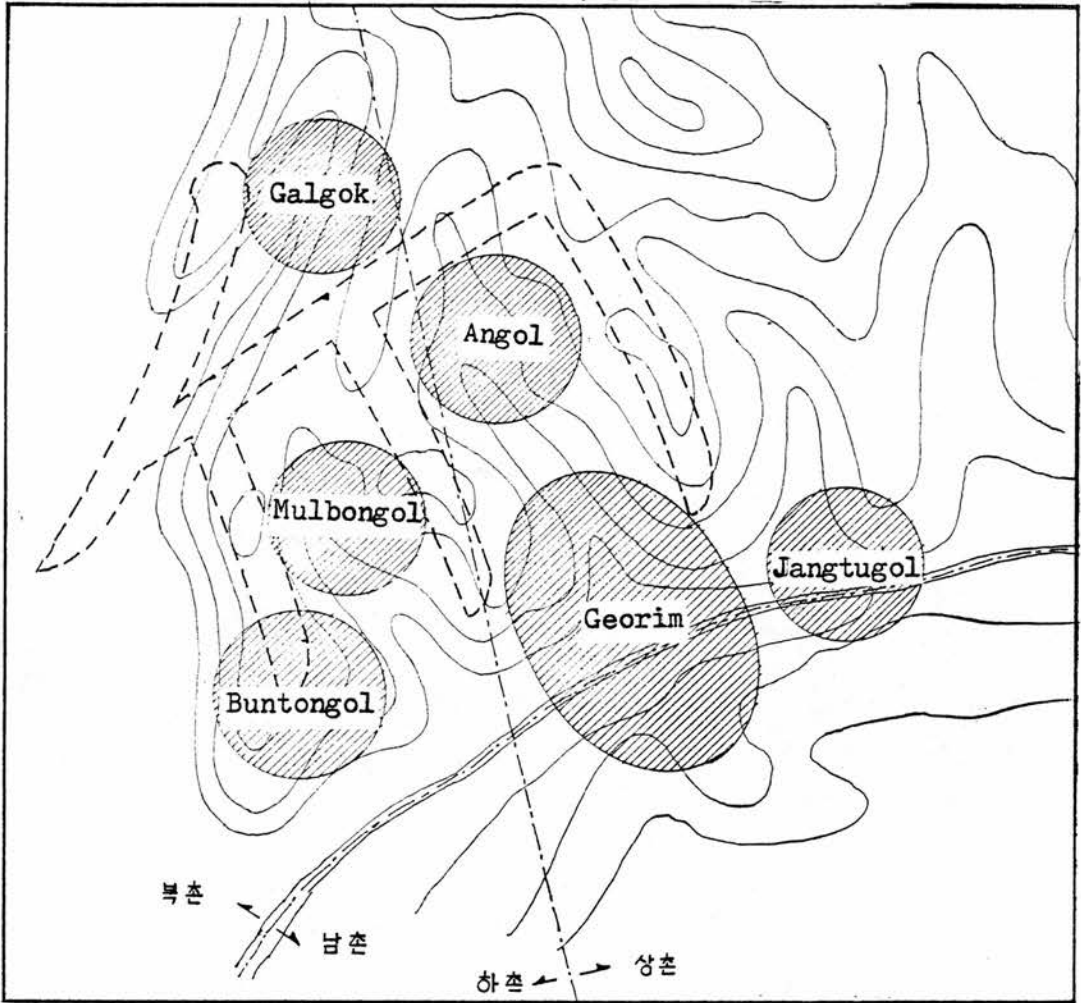


Fig. 6-4. The site map of Yangdong.



▨ : Built-up area

Fig. 6-5. The contour map of Yangdong.





-  : Surveyed house compounds
-  : Household site

Fig. 6-6. The site map of Sopyung.

which are subject to Yangdong clan families and most of the households have no special social or economic relations with Yangdong at present. But all the house compounds still maintain the basic structure of Sang-Min residences at Yangdong which the first settlers of Sopyung seemed to have copied as the model for their houses. Since then, people have adapted their house compounds to accommodate their new life. Perhaps because it is not an old established village, there is no village festival and the folk religion is practiced little in the village.

Generally, village festivals have a shamanic origin with some influences of ritual adopted from Confucian ancestor worship rites. During the village festival, the class division between the Yang-Ban and Sang-Min are more or less softened and sometimes the Sang-Min people are allowed to behave freely so as to cross the line dividing the two classes in strict social norms. Apart from the ritualistic ceremonies, on this living theatrical stage Sang-Min people could even criticise the Yang-Ban class by the performance of satiric dramas and dances and this functioned as a kind of social pressure valve. Regular village festivals are mounted twice a year in Seommaeul and once a year in Euin and there are permanent places for prayer (small pavilions or symbolic marks) in both villages (No. 13, 14, & 1 in fig. 6-2). Contrary to the usual case in old established traditional villages, there is no regular village festival as such in Yangdong. Instead, the common interests of the Yang-Ban in Yangdong, are centred on the clan gatherings and routine ancestor worship rites. This is the reason why there are 10 clan pavilions (Y12 & Y32 in Appendix I) in Yangdong and its ancestor worship houses (Y13, space 16 of Y1, and space 16 of Y4) and ancestor worship alcoves (a corner of Sarang-Daichung or a closet as in space 5 of E30) within buildings far outnumber those in Andong region (Euin and Seommaeul). This implies (together with the practice of village festivals) that the Confucian ideology has been strictly in command of the villagers' life in Yangdong. Even folk religions are strongly criticised

here and despised by the Yang-Ban ; although some households from nearby villages practice divination related to farming.

Also, from the structure of the Yang-Ban house compounds of both regions(see the house compounds chosen as members of the hypothetical collection H in chapter 8), we can read the difference in their lives and value systems. While the Sarang block(Men's quarter), for example spaces 8 to 16 of Y15 in fig. 6-8, is well developed in the Yang-Ban houses of Andong region, Moongan block (storage and multi-purpose building), for example spaces 28 to 33 of Y15 in fig. 6-8, is well developed in those of Yangdong. This tells us that the Yang-Ban of Andong region pursued a life of scholar gentleman whereas those of Yangdong became nearer to local landlords with their accumulated wealth from expanded farmlands.

Though the Yang-Ban of Andong region were no less committed to the high culture(Confucian) ideology, the low culture(shamanistic) ideology(as we argued in chapter 5) was more tolerated in Euin and Seommaeul than in Yangdong. This can be seen as much in the spatial organisation of the Sang-Min house compounds of both regions as in their practice of village festivals. Whereas in Yangdong the Sang-Min could not develop their house compound(for example, see house compounds 6, 7, 9, 22, 29, 42, & 43 of Yangdong) to meet more than the basic needs of sleeping and eating, in Andong region, the Sang-Min had more flexible adaptations to the local conditions and farming requirements(for example, see house compounds 1, 6, 17, 20, 36, & 43 of Euin and 13, 18, 21, 27, 35, 43, & 47 of Seommaeul). This tells us that the Sang-Min of Yangdong lived under the strict control of the Yang-Ban ideology while, in Andong region, there was some flexibility in the relation between the two social spaces(see section 5.2.) so that the Sang-Min could express their ideologies to a substantial degree in their life space. The Sang-Min of Yangdong were only able to reflect their values in their life space after they had moved to settle in an independent village, Sopyung(see plans of house compounds of Sopyung in Appendix I).



As we argued in chapter 5, house compounds of the Sang-Min class corresponded more sensitively to local natural conditions while the space organisation of the Yang-Ban class people preferred a commitment to cultural norms or social conventions. For example in Sopyung, people built chimneys in front of their main building facing south in the house compound, which is very unusual. It is an attempt to adapt to the local aerodynamic conditions. They also punched holes around the wall of the building below the floor level into the hot air channels of the heating system(On-Dol) to be able to clean the channels easily through these holes whenever necessary while keeping them closed otherwise. In another case, to meet the increasing requirements of space for living and storage, villagers adapted the existing conditions of their compounds. They extended the covered area of the eaves by extending roofs outward in front of buildings(see deep roof lines in plans of Sopyung). The outdoor spaces located between the rear wall of main building and the fence wall is converted into indoor spaces by merely covering these with roofs and adding walls as in spaces 4 and 5 of S017. To compensate for the lack of Ma-ru(flooring) space, villagers make movable flooring units and attach them to the indoor rooms whenever necessary. As well as making these adaptive measures, they also introduced a number of new constructional materials such as cement blocks, slates, etc..

The rigidity of the Yang-Ban in the use of space is well exemplified by their blind adoption of Ma-ru space in their house compounds(see floor spaces in plans of house compounds included in the H village which is dealt with in chapter 8). They introduced a substantial proportion of Ma-ru spaces into their residences based upon the model of residential quarters in the court. As this space has no built-in heating system and at least one side is open to outdoors, it cannot be fully used for about half the year. Nevertheless the Yang-Ban people allocated a large proportion of this space within their house compounds disregarding the great differences in the climate conditions from one region to another. In many cases of the house compounds of

the Sang-Min class in Yangdong and Seommaeul however, the Ma-ru spaces have built-in walls to adapt to the local weather condition.

We may take example of the use of feng-sui to show how the two classes responded differently in their spatial responses. Even though feng-sui itself was not controversial in the cultural ideologies of either Sang-Min or Yang-Ban people, once it has become subservient to the high culture ideology, it became less available for those sustaining the folk culture ideology. Without referring to feng-sui, Sang-Min people orientate their buildings most favourably to their local conditions. For the people of Sopyung and Seommaeul, even though the orientation of their houses did not obey the principle of feng-sui, it did not matter for them as far as they could make the most of their sites by facing their buildings towards south. In contrast, the Yang-Ban people could not disregard the principles of feng-sui and these take precedence over the bare natural conditions presented to them. In laying out their house compounds, the understanding of natural conditions should, for them, be put into the frame suggested by the principle of feng-sui. For example, in Euin village, with only one exception(E33), the main buildings of all the house compounds face westward to abide by the feng-sui principle in which relative locations and shapes of streams and mountains surrounding the village and far beyond are consulted. The disadvantage of facing the main block(for example, spaces 2, 3, & 4 of E10) to west was compensated by orientating the Sa-Rang block(Men's section) to the south(see, spaces 8 & 9 of E10). In the other Ban-Chon, Yangdong, where the topography is so varied from site to site because of the steep hills and narrow valleys(see fig. 6-5), groups of house compounds or individual house compounds employ their own orientations fitted to each site within the feng-sui model.

In this section, we have described the four surveyed villages focussing on the two interacting poles of the socio-spatial field of communication only at a surface level through the observed facts. A deeper understanding of the manifestation of this interaction will

emerge when the house compounds of the villages are investigated in the remaining sections and chapters.

## 6.2. THE NETWORK OF TOPOLOGICAL RELATIONS

In investigating the socio-spatial field of communication we are more interested in the relational structures of the differentiated individual regions of space and their connections, as they regulate and respond to the exchange of energy-information through the social field of communication, than in their aggregation modes or the morphological pattern perceived in euclidean terms. To deduce the underlying relational structure from the investigation of spatial organisations, it will be necessary to adopt a topological rather than a euclidean framework.<sup>(1)</sup>

To investigate the topological relations between individual regions, an individual region is represented by a point and the connection between individual regions by an edge so that a space organisation is represented by a graph.

The individual regions of space are represented abstractly by points despite all the differences which these contain in dimensions, physical properties, and functional and social categories. In the socio-spatial field of communication, the individual regions of space represented by points refer to the independent units engaged in energy-information transactions. They are not like irreducible atoms but rather like monads which contain a totality in itself as a microcosm or a miniature world. The edges representing the linkages between these individual regions of space do not distinguish between different levels of access for different sexes, classes, or objects and so on, and also do not count the quantity, contents, and modes or forms of energy-information exchanged. Edges refer abstractly only to the fact that there is at least one connected route between individual regions of space for energy-information transactions.

Graph theory is most appropriately applicable to the study of relational structures, for it deals with the connectivity of point sets in the most general and abstract sense. As points can represent any subject matter, whether it be persons, chemical elements, spaces, concepts, or objects, with edges connecting the points to represent their relations, graph theory has been widely applied in fields such as management sciences, communication sciences, biology, psychology, sociology, geography, and urban planning and architecture.<sup>(2)</sup>

The introduction of graph-theoretic conventions into the study of socio-spatial field of communication gives mixed benefits. Since we can represent anything we can imagine by points, and the relations between them by lines linking them, the detachedness of the theory from all the particulars of the subject matter provides a generality which can penetrate into the deep invariant structure which might be universal to every society despite their variant surface manifestations. On the other hand, the abstract foundation of the ideas often leads to difficulties of interpreting the results of analysis in a meaningful way, because the analysis is bound to be developed at an abstract level without a firm connection to reality. Disproportionate indulgence in the mathematical manipulation of graph theory is in evidence in some social or psychological studies, although it must be admitted that this is inevitable to some degree at the development stage of a theoretical concept.<sup>(3)</sup>

Let us take up some of Lewin's ideas in view of their originality in building theory using topological concepts in general and because of their relevance to the investigation of the part/whole relation in spatial organisations. Lewin introduced topological concepts of graph theory into the study of psychology without specifically mentioning graph theory.<sup>(4)</sup> Here, psychology deals with the problems of personal 'life space' in which individual psychological domains are spatialised by defining these as the individual bounded regions. In this representation, the shortest

path means a path which crosses the smallest number of boundaries of regions. This representation corresponds to a linear graph in which the regions correspond to points and the possible boundaries between regions correspond to lines joining these points.

Lewin is of the opinion that, for the description of the psychological situation of a person, a constructive representation of the state of both person and environment is necessary. Lewin introduces the term 'psychological life space' to describe the totality of facts(situations) which involve both person and environment.<sup>(5)</sup> The life space is represented by a psychological region as a whole. Everything in the psychological situation can be represented by a region. Thus a psychological situation as a whole region is composed of part regions. Topological relations between these regions are of prime importance for describing psychological situations. The separatedness and connectedness between regions determine the part-whole relations between different parts or groupings of regions in a life space. The criterion of connectedness indicates that certain psychological regions of a person and environment influence one another.<sup>(6)</sup> A person in an environment is conceptually constructed as a certain topological relationship between the two regions of person and environment. In the psychological life space, a homogeneous region is differentiated into part regions. The reverse process of integration also takes place to restructure the topological relations of psychological regions in the life space.<sup>(7)</sup>

Lewin fully exploited topological concepts within the framework of the part-whole relation in his theoretical psychology. By spatialising psychological concepts, he transforms the psychological situation of a person in an environment into statements of certain topological relationships between different regions. In this conceptual scheme, the topological ideas of part-whole relation elaborate along the axis of relational categories such as inclusion (being contained in), connectedness(separation or unity), and binary relations(connected or not connected, or included or not included).<sup>(8)</sup>

Lewin's work contains useful suggestions for the strategy of research in architecture, especially for that concerned with social consciousness. Although the demarcation of categories might be varied in each field, both psychology and architecture are concerned basically with the interaction between man and environment. Whatever it may refer to for man and environment in different contexts, we might argue that psychology is generally interested in man's world as a reflection of his environment while architecture, specifically the socio-spatial study at issue here, deals with environment which reflects man as its inhabitant. We can put it the other way round : psychology studies environment reflected in man while architecture studies man reflected in environment. In this sense, both fields pursue the same subject matter in opposite directions. Moreover, the dual nature of the physical and non-physical domain comprises the core subject matter of both fields as far as socio-spatial study is concerned. Whether one domain is the quasi-phenomenon of the other or not as the much debated problem of mind/matter dualism suggests,<sup>(9)</sup> it seems to be inevitable that both domains must be considered together in socio-spatial study as in psychology.

Lewin's topological psychology remains as an untested theory for it only formulates descriptive frameworks rather than further analysing and explaining the phenomena in question. In socio-spatial study as with psychology, the introduction of a mathematical language presents difficult problems of translating the phenomena involved with interactions between their physical and non-physical levels into abstract structures, responding both to their complexity and sensitivity.

During the last decade or so, significant efforts have been put into the application of mathematical ideas in architectural research. Philip Steadman recently brought the published material together, focussing especially on the application of graph theory, with the hope of encouraging their further application to the fields of design, building science, and architectural history.<sup>(10)</sup>

All of this work, without exception, takes account only of the physical level of space organisation. Or at best this inclination is justified by the excuse that for the time being considerations of the non-physical level cannot but be postponed until we get clear of the physical dimension. Although this work opens up a new perspective for the development of architectural theory, the philosophy behind it hides as much as it contributes to the deeper understanding of architecture. The rationale which underlies this attitude is the unquestioned commitment to Cartesianism.<sup>(11)</sup> Following the Cartesian doctrine, architecture is conceived only as the embodiment of shapes and their varied transformations. Accordingly, within this conceptual framework, axiomatic rules operating in geometrical extension constitute the autonomous domain of architectural discourse. As a result, the work resorts for explanation to a reduction into quantity derived from the repetitive common unit.

We are not here disputing the seriousness or importance of this work. But, when its rationale is identified with Cartesian mechanicism<sup>(12)</sup> and no room is left for the consideration in any form of the relation between the two realms of mind and matter, their application is bound to fall into the fallacy of physicalism. Considering buildings as cultural objects, an exclusive concentration upon their physical extension cannot be an autonomous domain in architectural study though it can provide effective and powerful guidance. However, once it is admitted that any kind of spatial organisation is social and that society is spatial, we cannot be sure how far a socio-spatial study can deal with its subject matter at the separate levels of the physical and the non-physical and then try to synthesise these separate domains into a single phenomenon. In the works collected by Steadman, no attempt has been made to place these complementary domains in a comprehensive framework. Too much physicalism is found in every corner of architectural thinking. Every student of architecture seems to be conditioned to believe that we cannot do anything about architecture without first considering its material fabric.

Despite our arguments against physicalism, we should not, nevertheless, under-estimate the difficulties and complexities involved in considering the physical and non-physical levels together at the same time in socio-spatial studies. Moreover, when it comes to the problem of representing the real life space using abstract graph-theoretic conventions, we have to be selective in describing the phenomenon under investigation. In transforming space organisations into networks through graph-theoretic representations, we must try from the start to look at physical settings within a framework based on their socio-cultural understanding rather than attributing social interpretations afterwards to the patterns of space organisation generated by axiomatic rules. We already set out, in chapter 4, the basic criteria by which the socio-spatial field of communication can be contained in an abstract language under the control of socio-cultural understanding. Considering the non-physical level of spatial differentiation, the distinction between interior and exterior is as much non-physical as physical. At the physical level, the relative closedness or depth of one space from another might decide the relative interiority of a space. As we argued in chapter 4, interiority might, in its widest sense, be attributed to individual spaces with self-identity differentiated from their neighbours.

Insofar as the differentiation of space accompanies social processes, the distinction of interior and exterior is social. In describing and analysing the socio-spatial field of communication, we will concentrate on the house compounds within communities. The system of outdoor spaces connecting house compounds in the villages is contingent upon being clearly defined and identified with individual regions for the graph-theoretic representation. We feel that the outdoor space of a community should be dealt with in a coherent framework in a close relation to and not separately from the interior of house compounds. But we must leave the working out of this comprehensive framework to the next stage and it lies outside the scope of the present study.



In our study of the socio-spatial dialectic, space is not treated as the substance of nature as such but as a cultural object. Here, the built environment is the socio-spatial entity through which society and space constitute one another at the same time, transforming nature into culture. The built environment seen as a socio-spatial entity is transformed into networks of graph-theoretic representation through subjective experimentation. These networks are objects at another level, which represent the built-in structure by which the society regulates the exchange of energy-information among the members of a community through the medium of space. These networks are not the product of a logical process operating in nature but objects created by the experimenter through his understanding of the culture of the community concerned.

The network shows how people of a community attribute a wholeness to parts of space by transforming them into individual regions of space and by connecting them. The connected parts (individual regions of space) each become a whole with their own identity(individuality), which in turn becomes a part of a whole at another level. In the final chapter, the analysis and interpretation of the structural and parametric properties of networks reveal how people of a community manipulate the spatial means within the logic of parts and wholes in the regulation of energy-information flow corresponding to the part-whole relations immersed in their collective life. The imposition of natural logic upon culture is avoided and priority is given to the dialectic between nature and culture ; space is not treated in exclusively quantitative terms but includes the qualitative dimension within its part-whole logic.

### 6.3.ENERGY-INFORMATION AS THE SUBSTANCE OF THE SOCIO-SPATIAL DIALECTIC

It might sound odd to criticise physicalism while adopting physical concepts such as energy-information and the principle of least effort. As we argued in chapter 3, the socio-spatial

dialectic operates not in one domain, of nature or of culture, but proceeds through the interaction between those two domains. The process of experimentation is based on this conceptual framework. We already discussed the general concept of experimentation in section 4.2.2. as that of reorganising objective data by an informed subject within a conceptual framework based on an understanding of the culture of the community in question.

In this perspective, the identification of individual regions and of their connections cannot properly be achieved by considering only physical aspects of the built environment. This would lead to interpretations which are foreign to the community. The physical aspects of space organisation do not suggest any meaning without considering how people use, adapt to, and change them for their daily activities. To grasp how people manipulate the spatial medium for energy-information transactions in their life space, the important thing to consider is not fixed physical enclosures but how people organise space by combining fixed and unfixed elements. So, individual regions and their connections are identified by considering both the physical conditions of spatial organisation and how people use and manipulate it for their daily activities in conformity with their social values.

In section 4.2.2., we discussed the concept of experimentation which is to be applied for the identification of individual regions and their connections. Let us recapitulate the main ideas of this process by taking an example of a particular house compound(E13). If we consider only physical aspects, the whole outdoor space A in fig. 6-7, (b) might be considered as one continuous region rather than as a set of connected individual regions. Also, the bases B might be regarded as being included in the whole outdoor region if account were taken only of spaces bounded by walls and roofs.

If we follow the guidelines of the experimentation, however, the outdoor space is identified as composed of several individual regions as shown in fig. 6-7, (c). These are created by the siting of

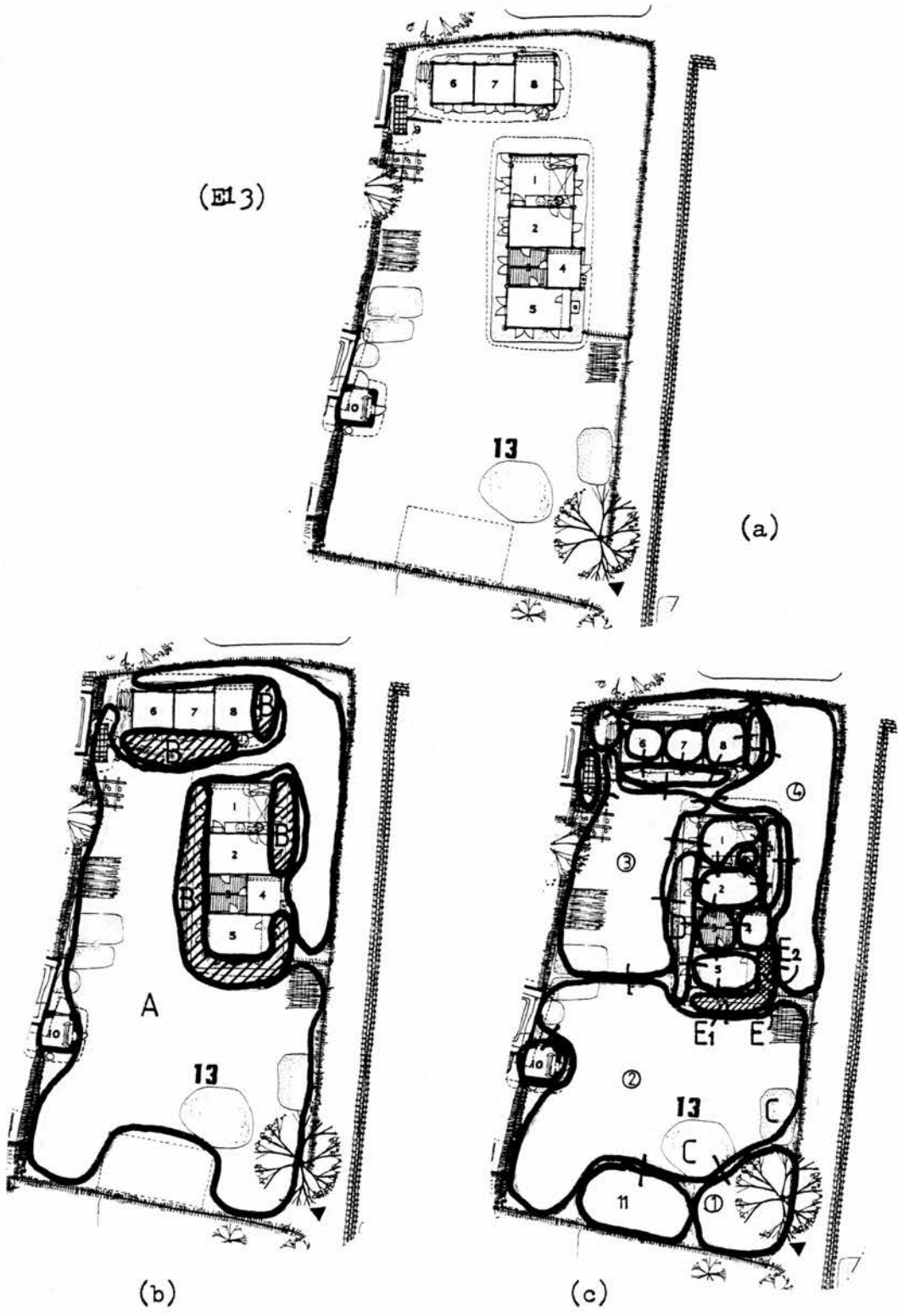


Fig. 6-7. The process of experimentation.

buildings as the fixed elements within the compound and the use, in different ways, of the portions of space located in front of, at the back of, and on the sides of the buildings. These portions of space acquire their individual identity through their closedness (defined by surrounding buildings and objects), their relative orientations, their connection to indoor spaces with certain functional and social characteristics, and above all through the distinctive ways in which people use them. They have distinguishing names such as Anmadang(inner yard)③, Duitmadang (back yard)④, and Sarangmadang or Bacatmadang(outer yard) ②. Though① and ② appear to belong to one space, the residents differentiate it into two individual regions by locating the semi-permanent nursery(the space number 11) and two large dumps of compost (c) in relation to walls nearby. Space 1 functions as the forecourt of the house compound and this provides an intermediate space between the inner part of the house compound and the outside connected by open gate to a street lane.

Intermediate spaces are characterised by the physical condition of having at least one face of their volume, whether it be the roof or wall, open to outdoor space. If we take as another example the house compound Y15(fig. 6-8), these spaces mainly play the intermediary role between indoor spaces(Ma-ru), between indoor and outdoor spaces(base, Ma-ru), between the house compound and the outside(fig. 6-8, space 29), and between outdoor yards(fig. 6-8, space 11). There are some cases of these which take up an independent function(fig. 6-8, space 22) or which are used for multipurpose functions and passages(Ma-ru, fig. 6-8, spaces 6 & 16). The criterion of distinguishing whether the intermediate space is the semi-outdoor space or semi-indoor space will be whether access is permitted with shoes on or only with bare feet. Generally shoes are not worn in living spaces. However, in some categories of indoor spaces shoes are allowed such as, for example in fig. 6-8, kitchens(spaces 1, 27, & 31), toilet(space 35), and stores for cereal and food(spaces 17, 21, 23, 24, 28, & 33).

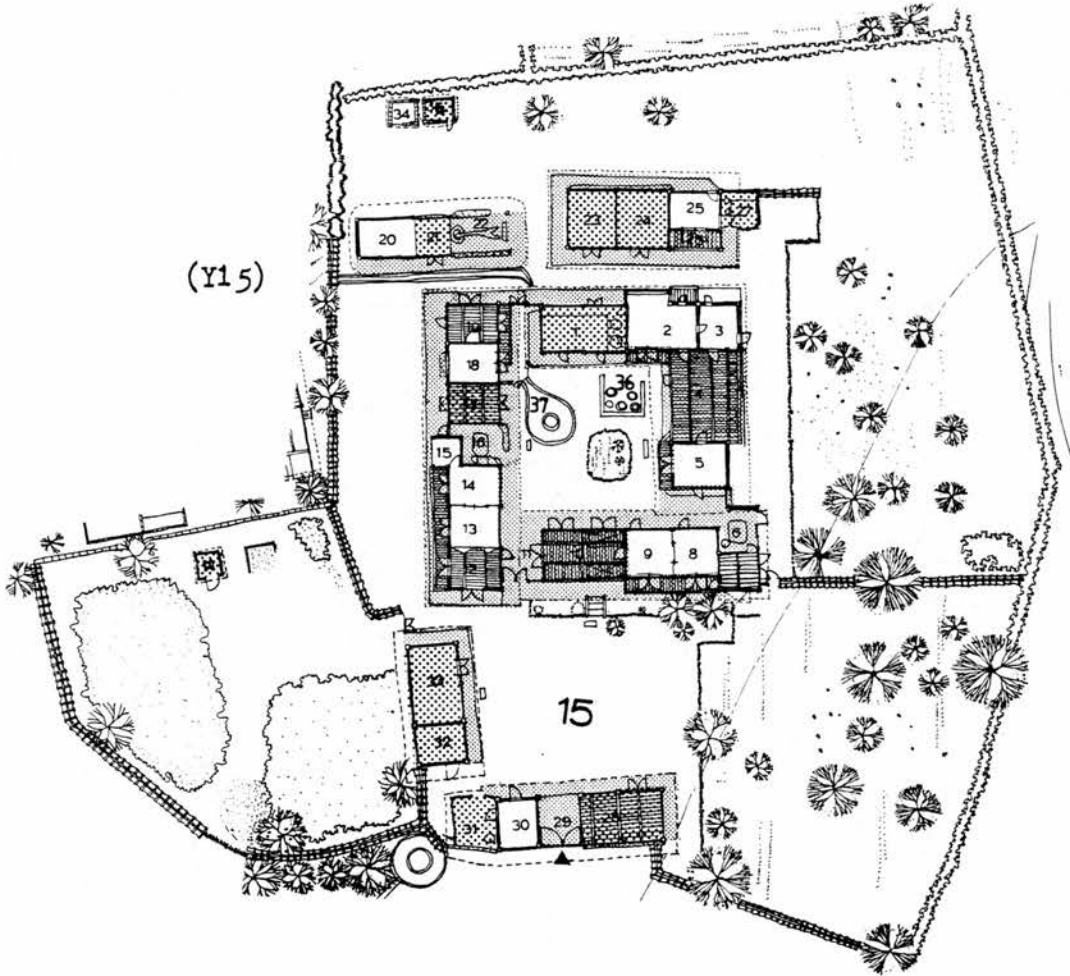


Fig. 6-8. Intermediary spaces( ■ ) and interior spaces( ▨ ) in which shoes are worn.

Going back to the example of (E13) in fig. 6-7, (c), the base spaces D and E consist a single continuous region without any barriers. But these spaces, with their different relative orientations, are used distinctively for mediating between different groups of indoor space with different outdoor regions ③ and ②. So, the spaces D and E are regarded as separate individual regions. If the base spaces like D and E have been developed beyond the intermediary function to have their own independent functions, sometimes by increasing their width, they might be considered as one individual region. Further, the space E might be identified as being differentiated into two individual regions E<sub>1</sub> and E<sub>2</sub> as shown in fig. 6-7, (c), considering their distinct orientations and connections with two different outdoor regions ② and ④. But, here the space E<sub>2</sub> either has no connection with indoor spaces to be mediated to the outdoor region ④ or it has no separate function of its own and remains a dead space as a structural element of the building. Insofar as it only functions in conjunction with E<sub>1</sub> to mediate outdoor regions ② and ④, E is identified as one unitary space.

Indoor spaces pertain to more or less clear cut functional and social categories, with little ambiguity in identifying individual regions. Instead, here, the ambiguity concerning the functions of openings needs careful experimentation to identify connections between individual regions. This was discussed in detail in section 7.2.(figs. 7-10 & 7-11). Even an indoor space might be considered as being differentiated into multiple regions according to the arrangement of unfixed elements and distinctions in the use of its parts. However, in this study, the consideration of the grain of differentiation within the house compound will be confined to the level of regarding one indoor cell as one individual region.

After all, the differentiation of space into individual regions and their connections are carried out by people for transactions of energy-information. In section 4.1., we defined the concept of energy-information in a very general sense as the

substance of social values which people of a community exchange with each other in certain structured ways. We need now to reinvigorate this general idea applied to the more or less abstract conceptual framework of the socio-spatial field of communication by recapitulating its meaning through the example of particular situations within concrete life spaces.

People in the villages are engaged in farming to produce rice, barley, corn, potatoes, and other crops. Farming activities require spaces within house compounds for storing cereals and farming tools and equipment, keeping cows, pigs, and poultry, the final stage of harvesting, storing hay, and so on. The villagers burn firewood to heat rooms and to cook meals. Cooking and eating meals take up a substantial amount of time in daily life. All these activities obviously are directly related to securing energy through the transformation of energy resources. All these activities culminate in the events of the clan gathering where the exchange of energy is indirectly carried out in allocating and distributing common resources to member families.

Activities taking place in their life space, that is the contact between people and the arrangement of objects, are consciously or unconsciously involved in the exchange of information. For instance, the arrangement of spaces for a series of harvesting activities or the allocation of spaces for storage basically relates to the organisation of information flow in their activities of classifying, sorting, relating, etc.. Discussions, negotiations, daily conversations, and all kinds of non-verbal aspects of people's life also relate to the information flow.

The building fabric of their house compounds are designed to regulate the energy transfer between indoor and outdoor spaces. The composition of building blocks and the compartmentalisation of a building into rooms respond to the exchange of information between people for varied activities. The organisation of information flow operates in regulating contacts between people in a structured

way according to different places and times, between men and women, the young and old, inhabitants and visitors, the Yang-Ban and Sang-Min, the ancestor and descendants (in the ancestor worship rites), and between different kinship relations. For instance, in preparing meals, who, where, when, how, and what to cook are set out in certain ways. Likewise, who has the meal where and how are also normalised in certain ways. While the activities from preparing meals to consuming them are related to the final goal of securing energy, all these are interwoven with the regulation of information flow.

The production and exchange of energy-information are not merely for the sustenance of people's bodies. Energy-information as natural substance counts little except as it is utilised for social life. The method of cooking and storing food, the ways of serving cooked dishes, the way of heating, and the way of harvesting rice — all of these activities follow cultural conventions and require properly organised spaces in that social context.

The mode of regulating information flow between people and objects is deeply ingrained in their activities and reflects social values. This information is always carried through the medium of energy-markers. For example, who eats meals where and with whom is normalised information in the life space but this information is recognisable only through the people, place, and food etc. involved. This information carries social meaning and, in this respect, people's activities in their life space are at root the energy-information transactions reflecting their cultural ideologies. The organisation of space is one medium through which people regulate the energy-information transactions in their life space.

These normalised cultural conventions invoke the differentiation of space into individual regions and the integration of them, and these are specific to any society. As far as the transaction of energy-information is concerned, individual regions are for persons



to stay and to put things in. Here, persons are bearers of the cultural ideology and things are objects as the products of that culture. For instance, even though plants and stones themselves belong to the domain of nature, they are cultural objects when they are organised in certain ways by people in their garden. The differentiated individual regions pertain to certain social and functional categories and are interconnected in a structured way so that persons and objects can be properly transferred from one region to another. By this interconnection individual regions are integrated into a whole conforming to the required arrangement of functional and social categories. The chain of activities ordered in a space organisation constitutes the continuous process of energy-information exchanges, whatever forms and contents it may take. The house compound as a level of life space in the village contains these activities as a single whole. And this space organisation houses the process of energy-information transactions as a totality activated by people in that life space.

The forms and contents of energy-information transactions are not taken into account in identifying differentiated individual regions and their connections in so far as these are regarded as being embodied in people's activities in conformity with the functional and social categories of the space organisation. But we exclude one category of energy-information transactions from the consideration. Certainly the communication between people from one region to another through the medium of sight and sound is a major form of energy-information exchange, but here, especially for the identification of connections between individual regions, we confine the definition of the transmission of energy-information to the case where the bearers of energy-information, whether these be persons or objects, are transferred between neighbouring regions. Moreover, these bearers of energy-information move or are moved on the surface, whether it be ground or built floor, under the constraint of gravitational force. The individual region of space refers not merely to a portion of this surface but to the life space rooted in and defined by this surface. The gravitational force is relevant

here not purely in its physical sense but in terms of its role in moulding the condition of a people's life space within its cultural context. However, the flow of sound, light, or heat between differentiated individual regions obeys the law of nature and can only be regulated through the medium of cultural conventions. Lighting, ventilation, and heating are involved in the energy-information transactions as systems of cultural conventions supporting people's activities in their life space. In the socio-spatial dialectic, energy-information does not refer to the substance of nature but its potential social values which are transformed through cultural conventions.

#### 6.4. CONCLUSION

Though we have further refined the concepts of experimentation and energy-information along the line of the conceptual framework developed throughout the thesis so far, the meaning of these is still to be enriched through the real experimentation on the surveyed material and the interpretation of the analysis. As much as the formation of a conceptual framework is a complementary process to the observation of facts, experimentation is itself a complementary process to the interpretation of the analysis, before reaching a deeper understanding of the socio-spatial dialectic through a metaphoric extension of the interpretation.

All these processes corroborate each other and do not exist separately or proceed successively in a linear dimension : only man's way of thinking and means of expression operate linearly. Without this understanding, even the consciousness of the danger of physicalism involved in applying an abstract language to the investigation of the socio-spatial field of communication would add nothing to a true understanding of the socio-spatial dialectic. A cautious tension between the subjective interpretation and the effort to gain objectivity within a coherent conceptual scheme should be maintained throughout the experimentation process in the remaining chapters.

## CHAPTER 7. THE GRAPH-THEORETIC REPRESENTATION OF THE SOCIO-SPATIAL FIELD OF COMMUNICATION

### 7.0. INTRODUCTION

In the previous chapter we set out the primary frameworks for the conversion of the real examples of the socio-spatial field of communication into analysable objects. We now turn to the procedure by which the topological relations of individual regions of house compounds are transformed into graphs. This will proceed in succession from converting plans of house compounds into individual region maps and then into individual region graphs through the experimentation process by which the identification of individual regions and their connections are carried out. All the individual region maps and individual region graphs thus produced are in Appendices II and III respectively.

We continue by discussing the qualitative characters of networks to clear the implications and limitations of these in representing the socio-spatial field of communication by networks. As there are a great extent of anomalies and variations from case to case in the socio-spatial grammar of the real life space, some basic principles of reading plans of house compounds are layed out and examples of applying these to the real cases are given accordingly. The goal of these procedures will be fulfilled in the next chapter when the networks are analysed and interpreted in a coherent framework to yield an understanding of the encounter between space and society.

### 7.1. THE NETWORK OF INDIVIDUAL REGIONS

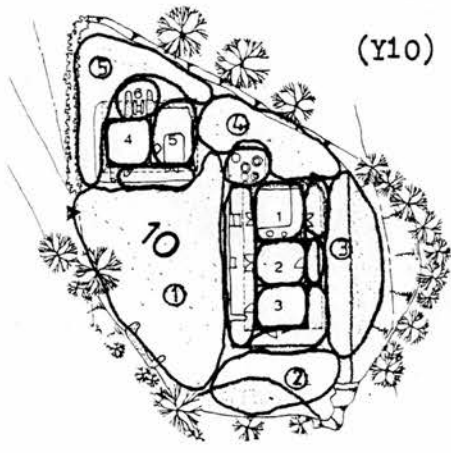
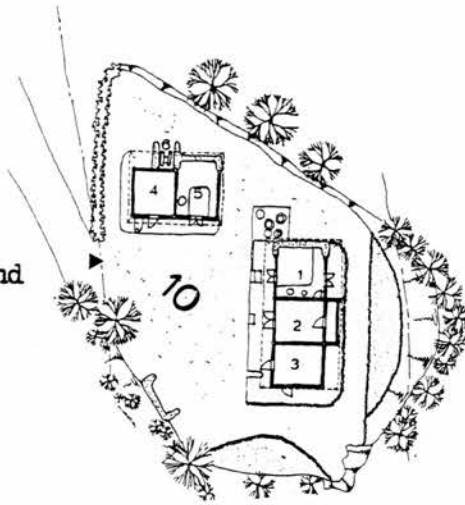
We now lay out the procedure through which plans of house compounds are turned into networks of individual regions. In the graph-theoretic representation of the socio-spatial field of

communication, the resulting networks are free of form and content because forms(modes) and contents of the energy-information exchanged are not at stake in the process of experimentation(see section 6.3.). What matters here is only the potential loci of energy-information as the differentiated individual regions of space and their connections. This is because, as we argued in section 6.2., the topological relations between individual regions are only relevant in transforming plans of house compounds into graphs. Value judgments are not involved in this process, concerning the forms and contents of the energy-information exchanged. Value judgments are put into effect at the moment of interpretation when decisions are made whether the incidence of points and edges corresponds to the established criteria for the graph-theoretic representation of the socio-spatial field of communication and when the analysis and interpretation of the networks are carried out. Networks are obtained by reading the objective record of plans of house compounds, under the guidance of the established criteria which were set out in chapters 4 and 6, through the understanding of the socio-spatial grammar of the community concerned. These networks then become objects to be analysed and interpreted in their own right.

First, we read the plans of house compounds in the villages(see, fig. 7-1 & Appendix I) according to the differentiation of space into individual regions. Then we produce the 'individual region map'(see, fig. 7-2 & Appendix II) which is independent of the shape of spaces, by marking the individual regions of space with bubbles<sup>(1)</sup> and the occurrence of access between neighbouring regions by a short line crossing the common boundary between them. Insofar as we are not concerned with the form and content of accessibility, we only count whether there is or is not at least one access between any two individual regions. Secondly, we transform the 'individual region map' into the 'individual region graph'(see, fig. 7-3 & Appendix III) by representing indoor regions with closed circles and outdoor regions with open circles, and connecting them by edges whenever there occurs an access between

(Y10)

Fig. 7-1. House compound plan.



(Y10)

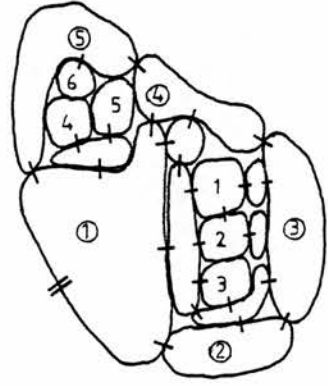


Fig. 7-2. Individual region map.

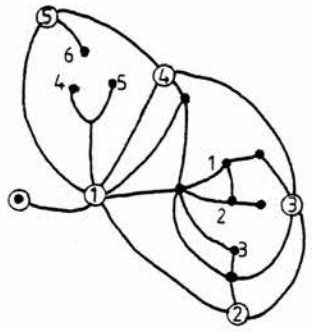


Fig. 7-3. Individual region graph.

them. Here, the labelling of vertices by numbers has no bearing for the analysis except for the cross-checking of the process. In the individual region graph, the exterior space outside the boundary of a house compound is represented by an open circle with a dot inside. This is the root of each individual region graph. We consider the house compound as a microcosm, that is a world of inside differentiated from the outer world at large. This microcosm cannot exist without the exchange of energy-information with the outside world which includes similar compounds at the same level of spatial organisation as well as the outside world beyond the village.

The networks thus constructed produce the connected simple graphs. This implies that there are no loops, no multiple edges between any two points, and no isolated components in the network. In the socio-spatial field of communication, any portion of space is connected to the other either by being a neighbour included within an individual region of space or by way of the connectedness between any individual regions of space at that level of consideration. The portion of space which remains undifferentiated to become an individual region of space, cannot possess the property of being a part as well as a unitary whole in itself but is an undifferentiated neighbour within an individual region of space. Without the exchange of energy-information, that is without connections to others, any individual region of space cannot exist. Any set of individual regions of space unconnected is unimaginable in the socio-spatial field of communication because the unconnected set cannot be a part of a whole at another level and accordingly it cannot become a unitary whole itself insofar as it cannot be included in the successive progression of a part-whole logic. Therefore, there can never be any isolated components in the socio-spatial field of communication. However, we can artificially segregate the components at certain levels in the graph-theoretic representation when it is necessary for the purpose of inquiry, as when we treat house compounds as individual space organisations in this thesis.

A graph is planar if it can be represented on a plane with no pair of edges crossing. In the graph-theoretic representation of socio-spatial field of communication, the resulting graph can be either planar or nonplanar. For example, in theory, two edges in a graph can represent interactions at different times so that their crossing has no real significance. But, in a real life space, the links connecting the individual regions of space cannot cross because the crossing signifies a region with its independent identity, as the link occurs only between neighbouring regions with a common boundary in the spatial continuum when there exists at least an access from one to another. Moreover, when the socio-spatial field of communication coincides with the surface on which man lives under the constraint of gravity, the exchange of energy-information is plane-bounded and any two independent regions cannot overlap at the same location in space at the same moment in time in the socio-spatial field of communication. When buildings have more than one storey, for example, the planarity of the network of individual regions is still effective for each storey. But, if we consider the edges connecting two individual regions each located on two different stories, the network can be embedded in the minimum number of an orientable surface with no pair of edges intersecting. In this case the planarity is preserved in a restricted sense. Anyhow, in our study area, all the examples are composed of single storey buildings. This property of absolute planarity of socio-spatial communication on the real physical plane seems to be the principal constraint at the physical level, which regulates the relational structure in the field of socio-spatial communication which would otherwise be random. Without this constraint, the topological relations between individual regions would be meaningless as every region could be connected to every other region without limitations. X

Together with the planarity condition, the principle of least effort is another primary constraint regulating the socio-spatial dialectic in the socio-spatial field of communication. If we reiterate the main theme of the principle of least effort, the

general ideas of which were presented in chapter 3, it says that man strives to achieve his maximum goal, whatever it may be, by investing the resources at his disposal, whether they be social or physical, as economically as possible, just as nature works in the most economic ways to attain a harmonious equilibrium of opposing forces with a minimum expenditure of energy. In respect of the regulation of the energy-information transactions in the socio-spatial field of communication, the principle of least effort produces optimum dimensional limits arising in the real life space in both the differentiation of individual regions of space and the connection of them, which are not unrelated to the planarity condition.

As we will show in our real examples of the differentiation of individual regions of space in the next section, a portion of space which is proportionally unfitted to the whole space organisation of which it is a part cannot remain as the individual region of space without either being differentiated into multiple individual regions of space, when it is too large, or being included as a neighbour in an individual region of space, when it is too small, for the individual regions of space to be most energy-economically organised parts within a whole space organisation. The same principle covers the connectivity of the individual regions of space. Considering the dimensions of the individual regions of space in a certain space organisation and the number of the individual regions of space which are to be connected in one way or another under the planarity condition, there may be some optimum ranges in the way they are connected most economically to become a unitary whole, serving the goal(function) of the space organisation.

## 7.2. THE INDIVIDUAL REGION GRAPH

To produce individual region maps out of the plans of house compounds in the villages, we have to identify individual regions and their connections in each example through experimentation along the guidelines which were given in chapters 4 and 6. As we



argued in section 6.3., the space organisation consists of indoor spaces, outdoor spaces, and intermediate spaces(fig. 7-4). Indoor spaces have more or less fixed walls and are attached to comparatively stable functional and social categories. For intermediate spaces, that is semi-indoor spaces like Ma-ru(see figs. 7-6) and semi-outdoor spaces like bases under eaves, the identification of individual regions and their connections is contingent, for these spaces as interfaces between the indoor and outdoor spaces or between different indoor spaces though contiguous lack clear physical indications for the subdivision of spaces. The outdoor spaces within compounds possess normalised ways of being attached to functional and social categories. Their allocation of individual regions is more or less ephemeral because of the lack of clear physical boundaries and of the flexible use of space according to seasonal or occasional needs.

Whenever there occurs at least one access between two individual regions of space, which share a part of their common boundaries, these two spaces are regarded as directly connected. Here, we are only concerned if these are connected or not. We do not question the quantity or qualitative nature of the access. Specially for the connection of the house compound as a whole with its exterior world outside, since we have not defined the identification of individual regions in the exterior space outside the house compound, we regard the whole exterior world outside as one region.

Varied forms of storage space are shown in the examples. We will regard storage spaces(closets), fixed in a room as permanent built-in structures, as independent individual regions of space and accordingly these will be represented by closed circles on the grounds that, as we argued in section 6.3., as a premise for this study we do not question the content(mode) and quantity of energy-information exchanged but only the structure of the flow network. As an example, see the spaces A, B and C in fig. 7-5.

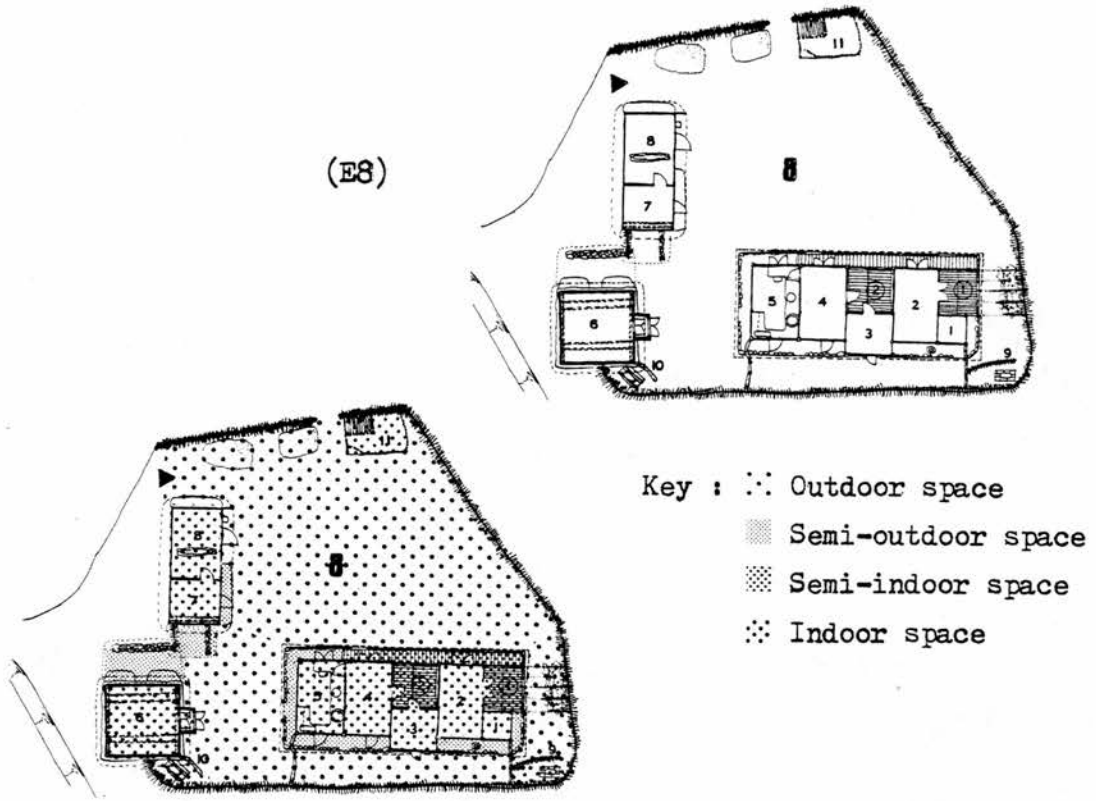


Fig. 7-4. Three distinctive regions of space within a house compound.

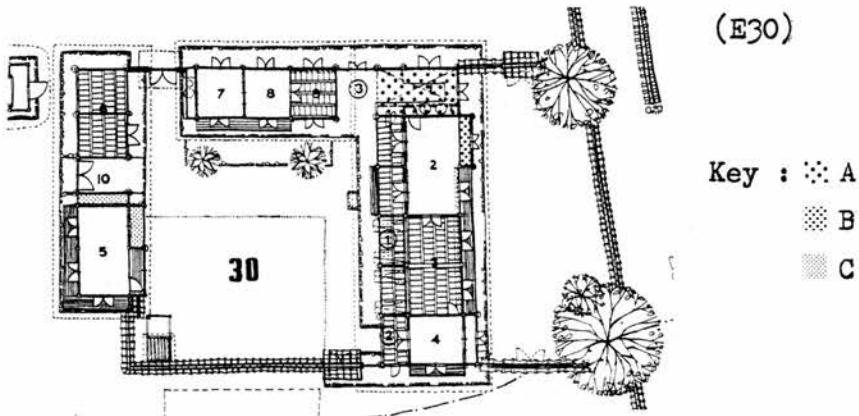


Fig. 7-5. Built-in storage spaces (closets).

In traditional Korean architecture the semi-indoor space called Ma-ru plays a very important role in spatial organisation because it mediates between indoor and outdoor spaces and it contains its own independent functions as well as varied supportive functions to the neighbouring indoor spaces. The diversified use of the Ma-ru in buildings raises the difficulty of properly defining the individual regions of space. Among the factors presumed to be significant in identifying these regions (i.e. the physical distinctions, functional homogeneity in use, and the cognitive dimension of users) functional distinctions can be detected easily through careful participant observation of the use of living spaces. However inhabitants' understanding of space is most obviously found in the names which they attach to the parts of a continuous space, even though all the three conditions are intertwined in the differentiation of spaces. In the example of fig. 7-6-1, (a), the Ma-ru space A continuously facing multiple indoor spaces is regarded as an individual region of space. As far as this Ma-ru space is concerned, there appear no functional or physical divisions or distinctions by naming in relation to the two separate rooms connected to it. The example of (b) shows a very obvious case which consists of three independent Ma-ru spaces clearly distinguished by physical means. The Ma-ru space in fig. 7-6-2, (a) is one continuous space physically, but it might be sub-divided into two, three, or four individual regions as shown in fig. 7-6-2, (b), (c), and (d) respectively. Following our presumptions, this Ma-ru space is differentiated into three individual regions as in (c) where B and C mostly function as auxiliary spaces to rooms 1 and 3 respectively and carry the related names accordingly such as Muritbang-Marua and Ckeunbang-Marua while A retains an independent function as well as supporting roles to rooms 1 and 3 at the same time. In the examples of fig. 7-6-3, (a) and (b), the continuous Ma-ru space is divided by slight physical means into two independent regions. Here, in (a) the two regions, namely A and B possess different names of Sarang-Daichung and Sarang-Marua and functions of a more or less independent room and a corridor respectively. In the case of (b) the Ma-ru space of A is again

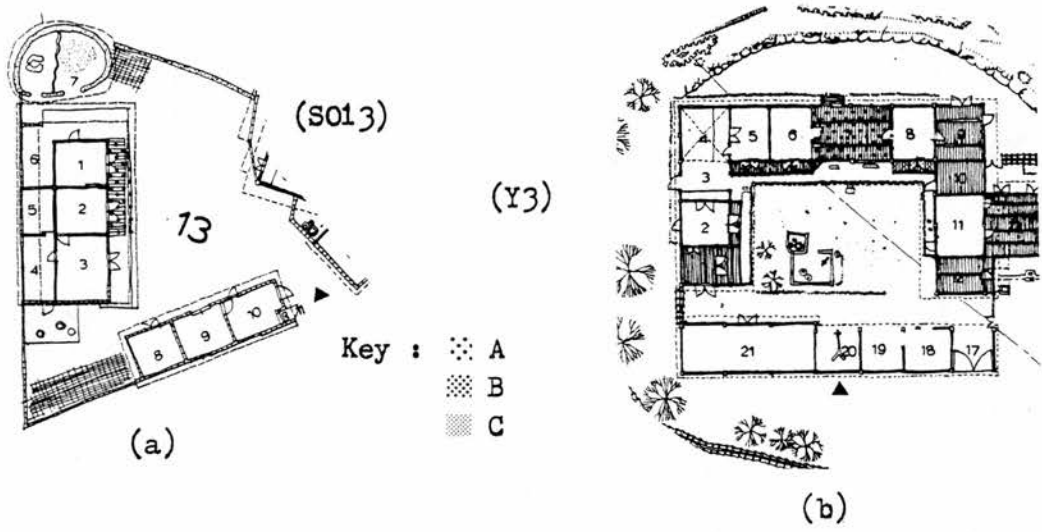


Fig. 7-6-1. Differentiation of Ma-ru space(I).

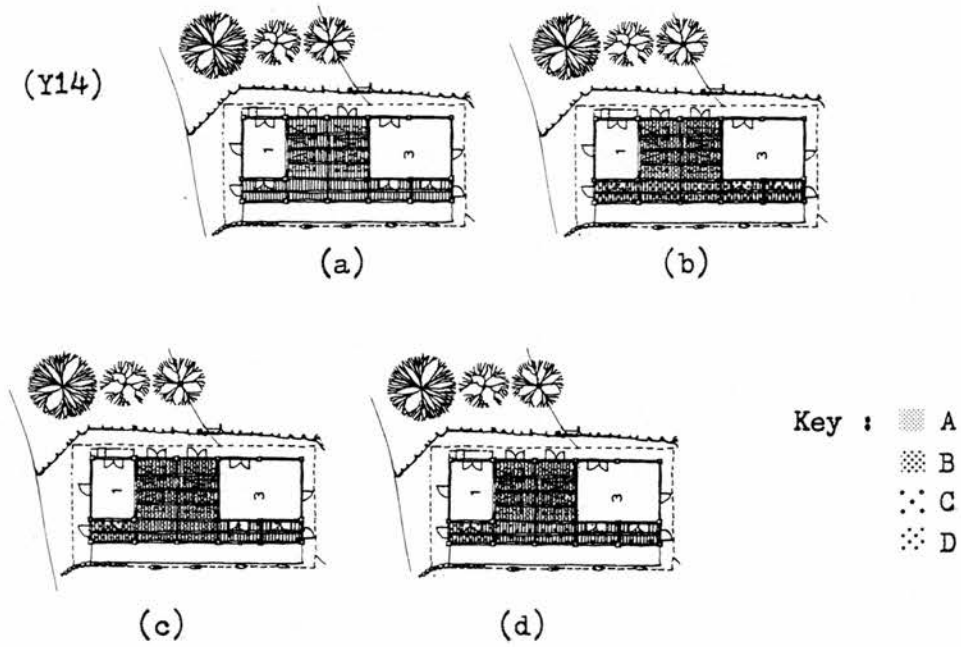
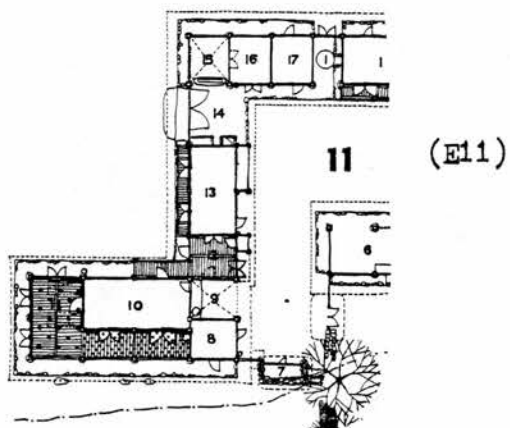
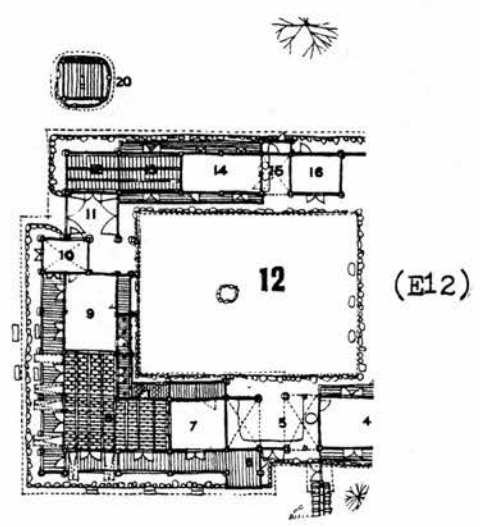


Fig. 7-6-2. Differentiation of Ma-ru space(II).



(a)

Key :    ∴ A  
          ∴ B  
          ∴ A1  
          ∴ A2



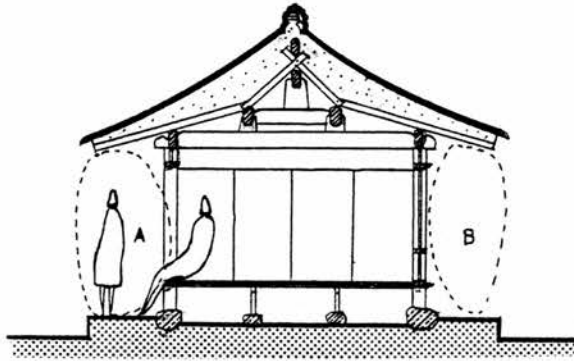
(b)

Fig. 7-6-3. Differentiation of Ma-ru space(III).

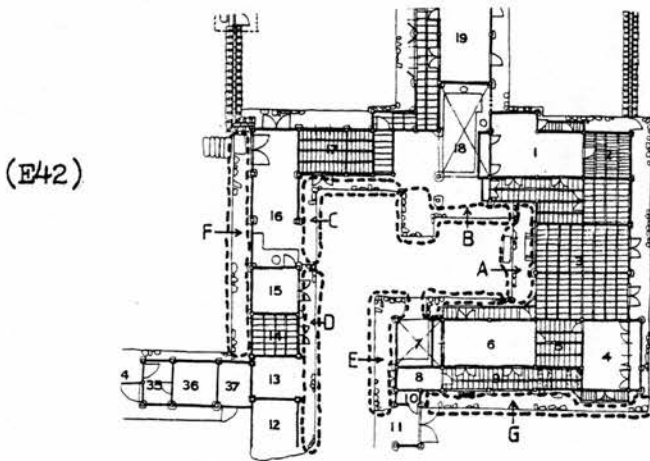
differentiated into two individual regions, A1 and A2, according to their differing orientations.

As shown in fig. 7-7, the semi-outdoor space, which stretches normally from the face of the outer wall to the eaves line, functions as an intermediary space between a group of indoor spaces and the neighbouring outdoor yard. This continuous space is sub-divided into more than one individual region in correspondence to the relative orientation of its parts and their adjacent indoor or Ma-ru spaces. The spaces A and B of fig. 7-7, (a) which appear to be in the same category of space, are distinguished in the field of socio-spatial communication. The space A is to be considered as a differentiated region as it occupies a point in the network of energy-information exchange among neighbouring spaces whereas the space B belongs to the contiguous outdoor space since it remains merely as a structural element without being engaged in the socio-spatial dialectic as there is no link between this and the neighbouring indoor space. In fig. 7-7, (b), the spaces A, B, C, D, E and F are all parts of the same continuous semi-outdoor space. Among those parts, the spaces F and G are differentiated as individual regions by the intervention of the wall dividing them from the other parts whereas the other spaces are differentiated from each other through the change of directions in parallel with the group of indoor spaces with which each one is related, edging around the outdoor yard.

In Korean traditional architecture, whether it be domestic buildings, palaces, temples, or educational buildings, the outdoor yard within a building compound is a unique and important feature of its space organisation. It is used not only for outdoor activities but also for the extension of indoor activities. It takes on the functions of a garden, and a work place, as well as that of outdoor rooms. Some parts of it might have relatively fixed spatial patterns, while other parts are open to varied use by arranging objects such as hay dumps, fire wood, or farming products in combination with already built-up fixed elements defining the



(a) Live(A) and dead(B) spaces



(b) Differentiation of base space into individual regions

Fig. 7-7. Differentiation of the semi-outdoor space.

space. Outdoor yards are differentiated into a set of individual regions of space by the distinctions of left/right and front/back divisions around the buildings and the functions of the yards are closely associated with the functions of the indoor space the faces of which surround it. The outdoor yards in the compound carry an independent function of their own and also are engaged in a very crucial role in the whole space organisation through mediating between and supporting the functions of neighbouring indoor spaces. The sense of closure created by surrounding walls or other structural or landscape elements contributes to forming an independent region of space. In the example of fig. 7-8, the outdoor yards A, B, C, D, and E are differentiated into individual regions of space according to the two factors mentioned above. In the case of the outdoor yard A, if there is absent any functional relations between this and the neighbouring indoor spaces as well as there being no identifiable homogeneous usage(function), then it will remain undifferentiated from the major outdoor space B. In that case, the spaces A and B will be represented by one open circle in the graph and identified as one region of space.

Taken together, the dualistic division of space, the sense of closure, the change of direction, and visibility conditions affect the differentiation of space.<sup>(2)</sup> In the study of socio-spatial dialectic the physical environment as a set of differentiated individual regions of space is regarded as a sort of complex field where users define place(location) by relative orientations, by the homogeneous functional contents as they are used by the occupants, which exert their influence to the neighbouring individual regions of space, and by the perceptual information. Each outdoor yard in fig. 7-8 acquires its identity as a unitary space by the combined effects of the field relations with its neighbouring regions of space(namely its location at the front of the main building), its own functions and the auxiliary ones related to its neighbouring spaces, and the visual properties of it produced by the physical elements in it and around it.



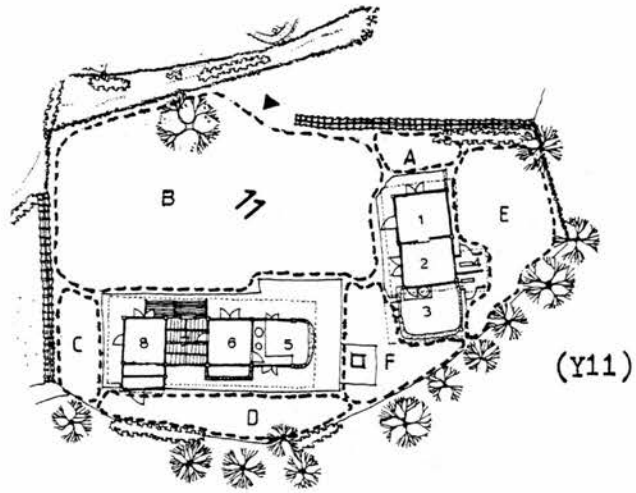


Fig. 7-8. The differentiation of space by the dualistic division of right/left and front/back.

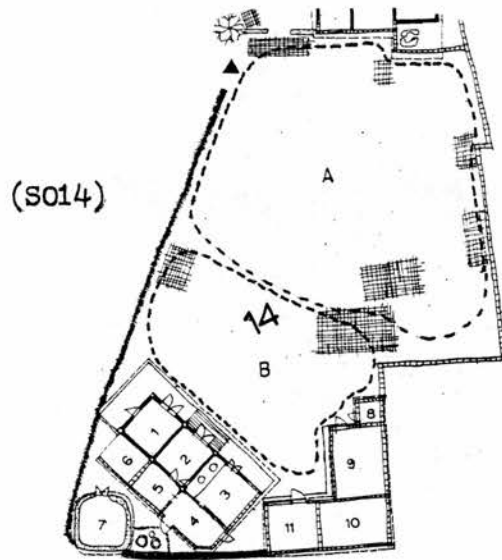


Fig. 7-9. Differentiation of a space having out-of-proportion dimensions.

It was found in our survey that the proportional size of a space in relation to the whole space organisation acts as a contributing factor in the differentiation of spaces. Here, the minimum-energy principle, which was discussed in the end of section 4.2.2., is at work. In the example(SO14) of our survey area, the outdoor yards A and B of fig. 7-9 are virtually one space in physical terms but they dissolve into two differentiated spaces, increasing the efficiency of energy-information exchange between neighbouring regions of space as well as the intensity of the space in terms of the perceptual field.

This clears the ground for the identification of individual regions in the surveyed examples, and we now turn to the identification of connections between them. There is an abundance of ambiguous circumstances when applying rules to decide the edges of the graph which occur when there is an access between two neighbouring individual regions of space. This problem stems from the fact that in traditional Korean houses there are many examples where openings are used mainly for lighting, ventilation, viewing, or carrying specific things in but are also often used as passages for people. We resolve this problem by relying on the principles that :

- 1) Although the opening obviously possesses the function of a window, if it is routinely used for carrying certain things in and out, then it is assumed to allow the incidence of an edge, because it is clearly used for the exchange of energy-information(fig. 7-10, ① , ②, & ⑦ ).
- 2) When there are multiple openings in a room, there appears to be a hierarchy in the use of them. Subordinate openings are likely to be used more or less as a window at the same time. In these cases if the opening has fixed structural extensions to support the passage of people or has an appropriate height for passage and is usually used for that purpose, this is regarded as allowing the incidence of an edge in the graph(In fig. 7-10, ③ , ④ , ⑤ , and ⑧ , & fig. 7-11, (a), (b), and (c) ). Even though the opening is homologous to a door, if it has no structural support(device) for

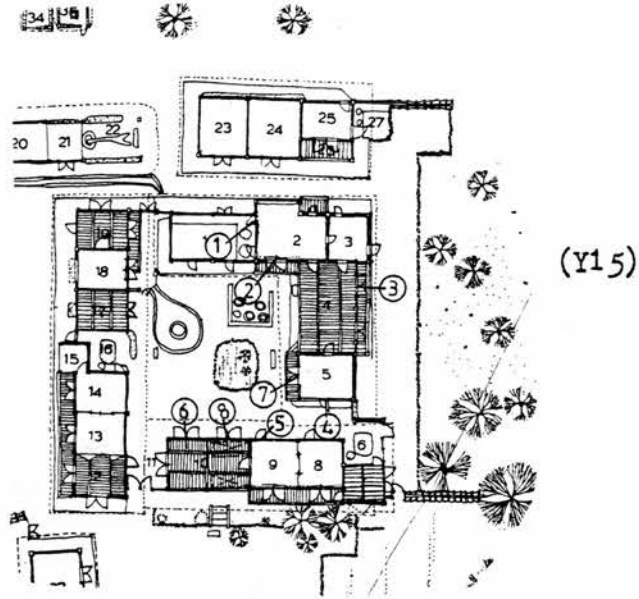


Fig. 7-10. Varied types of openings.

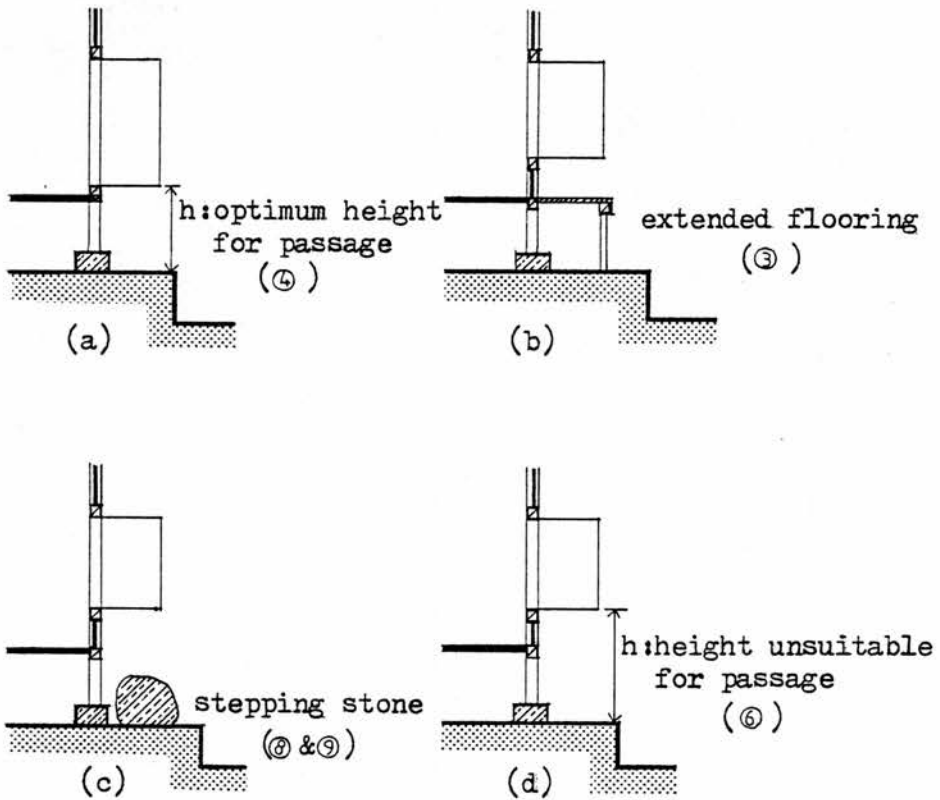


Fig. 7-11. Sections of openings.

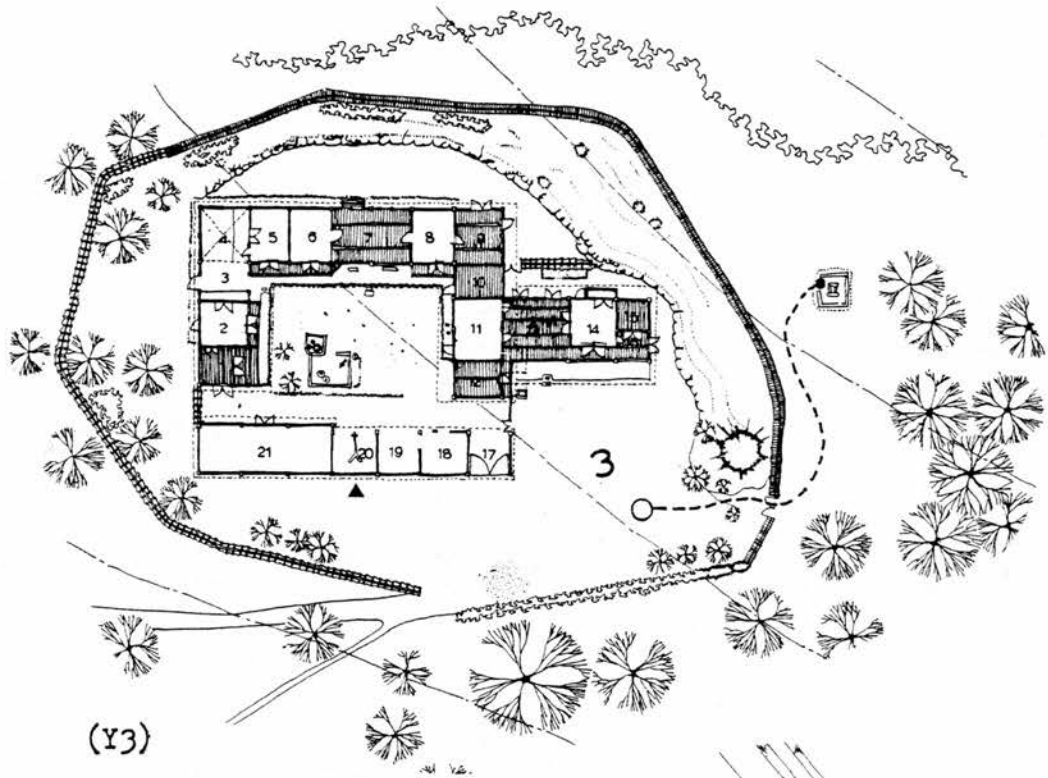
human passage, it is regarded as a window and there is no edge of the graph for this opening(fig. 7-10, ⑥ & fig. 7-10. (d) ).

3) The openings of ambivalent shape having equal characters of window and door and which also are used for dual functions are counted as resulting in an edge in the graph(fig. 7-10, ④ & fig. 7-11, (a) ). We can also think of the cases where the openings are not used for direct passage of people or things but are used for some form of communication between people, like any window, through the medium of sight and sound. As already discussed in section 6.3., this activity is surely a form of energy-information exchange at the social level. But we will limit the incidence of edges in the socio-spatial field of communication to the occasions where the bearers of energy-information are transferred from one neighbouring region of individual space to another which share at least some part of their boundaries with each other.

When dealing with gateways of house compounds, we are concerned only with the linkage between outside and the inside world of the microcosm treated as a unitary whole. There are some ambiguous cases where this link cannot be drawn clearly from the physical conditions of compounds :

1) In the examples of gateways A and B of fig. 7-12, (a) and (b), the origin of the link is not in the outside world but comes from the inside of the microcosm, which provides access to a dependent function of the compound located outside. It is not impossible to use these gateways to penetrate from outside to the inside of the house compound but normally this is not expected. These gateways are not considered to be the links between the inside and outside world but as that between two differentiated regions of space.

2) There are also some examples where the physical barriers are not substantial or opaque so the demarcation of the gateways is not explicit. As a result anyone can penetrate into the inside of the compound through any part of the boundary. For example, in the case of (SE8) in fig. 7-13, the barrier consists of a small channel running on one side and is implied only by the change in



(a)

(SE4)

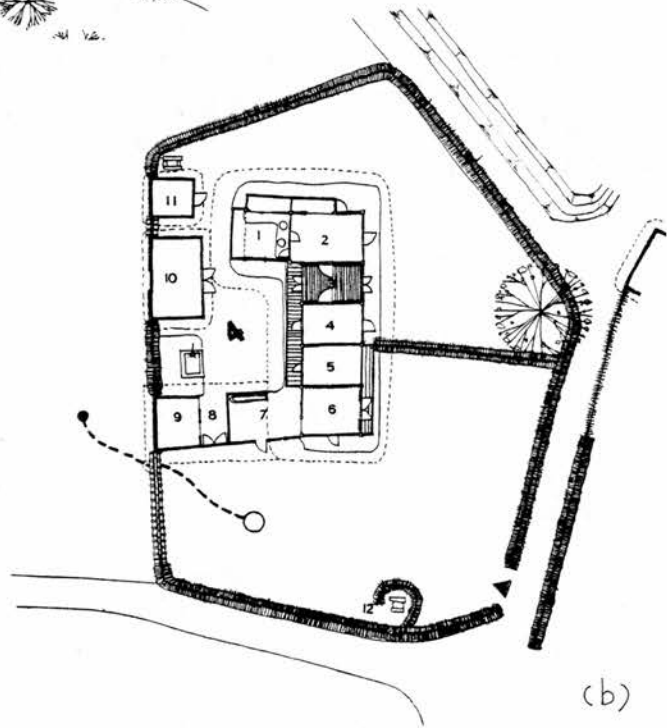
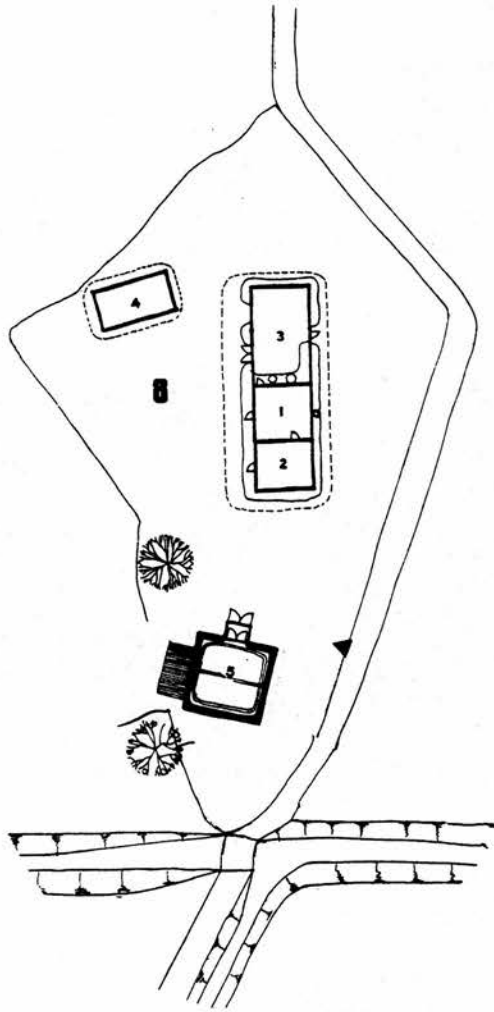


Fig. 7-12. The examples in which the origin of the link is from the inside of the house compound.



(SE8)

Fig. 7-13. The example which has no permanent walls.

land use on the other side of the compound. The owner of the compound may not have built a fence for economic or other reasons. But we can clearly recognise which part of the boundary is supposed to be the gateway from the arrangement of buildings in the compound as well as from the general conventions of making gateways in the village. Except for special occasions, people are expected to use this implicit gateway to come into the house compound. But, in another way, the indication of the gateway might be regarded as explicit in that the inhabitants and visitors have long been using the same passage as the way into the compound from outside. Even if there is absent any strong indication of the gateway by physical means, there exists the clear recognition of it in people's minds in the community and the way people normally use it reveals the obvious location of the gateway.

3) Similarly, we come across house compounds of which a great part of the wall was once damaged and has remained without repair for so long that this state appears to be stabilised. And there are compounds where there are many wide gaps along the fences. As shown in fig. 7-14, (a) and (b), the house compounds are permeable through a number of gaps in the boundary. But, again people are expected in normal circumstances to use the fixed gateways to enter the compounds. When physical means are incomplete in differentiating the inner world of the compound from the world outside, this weakness seems to be strengthened by the social norms of the community. So, in our graph-theoretic representations, the links between the world outside (root of the graph) and the microcosm (the house compound as a socio-spatial unit) is regarded as taking place only when these are supported commonly at both the physical and social levels in their function, people's cognition, and common usage.

For any house compound in the villages, the network is not a permanent one but is always subject to change. Some elements constituting the networks are relatively fixed in that the individual regions of space and the connections between them are composed of permanent settings at a physical level. This is the

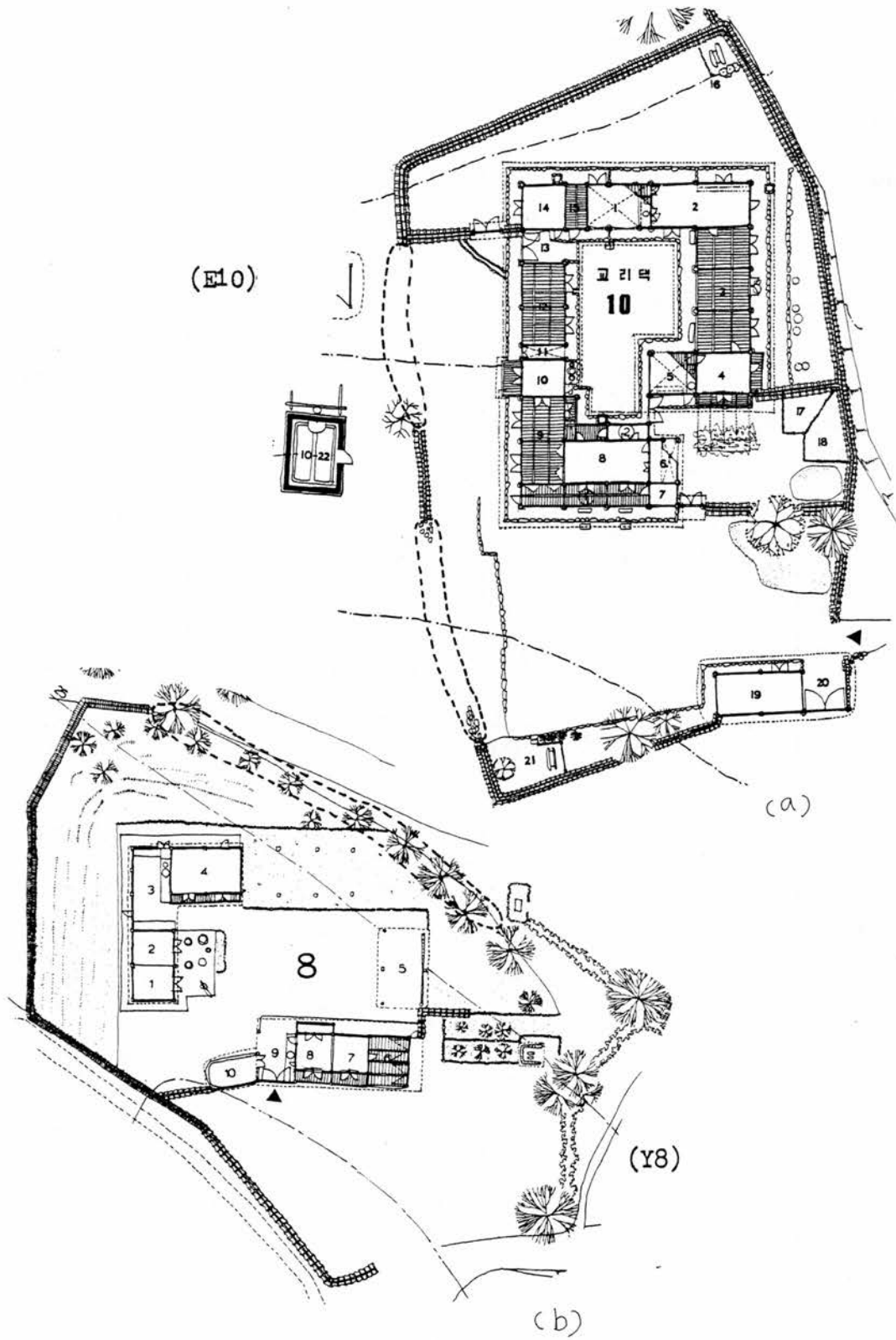


Fig. 7-14. Walls which have remained damaged and walls with gaps.



obvious case where inflexible physical settings resist people's intention to change a life space which is no longer able to contain their new content of life. The resistance of physical settings can only persist up to a point. Examples from Sopyung village explain this situation well. Nearly without exception, as we already discussed in section 6.1., house compounds are modelled according to those of the Sang-Min class of Yangdong village from which the first settlers of Sopyung came. The original type of house compound in the Y village shows little sign of change. But, the same type of house compound which has been copied and transferred to Sopyung has gone through as remarkable a change as villagers' life, liberated as they were from the restraint of Yang-Ban class. In Sopyung, most of the households modified their long established way of organising the permanent structures of the compound by refurbishing the back yard of the main building into storage spaces to meet the new demands which their new situation of life required.

On the other hand, there are certain normal ways of differentiating individual regions of space and connecting them at the social level, which are resilient to change. An outstanding example of this is evident in the organisation of Yang-Ban house compounds. This is isomorphic with the hierarchic system of kinship lineage. Space is differentiated by sex, age, and rank of the family members in the lineage system. In the life cycle, the headship and housewife-ship of a family transfer from one person to another. In the course of time a family member's role in the household and his or her rank in the kinship lineage change. According to these changes, the members of the family move in the house compound from one space to another, which are labelled by a fixed model of the lineage system.<sup>(3)</sup> Even if a certain space is available, nobody can use it until he or she reaches the status eligible for it.

### 7.3. CONCLUSION

The networks produced through the experimentation are objects which are then to be analysed in their own right. These networks include relatively unfixed elements which are liable to comparatively short term changes. These result from the condition that either the physical means of differentiating individual regions of space and linking them is ephemeral or people improvise space organisations in response to the immediate needs of their life periodically or seasonally. For example, villagers differentiate space in outdoor yards of their compounds differently from season to season following the changing requirements of their farming activities. From time to time occasions of gathering of the extended family or clan necessitate the improvisation of space organisation diverging from that of every day life. Accordingly the network represents a cross-section of relational structures of the socio-spatial dialectic at the moment in time when the interpretation is executed.

The networks are not permanent and infallible objects in another sense. There is no saying that experimentations of the same space organisation would always result in isomorphic networks. Networks are merely intermediary tools for the analysis of the socio-spatial field of communication, which is aimed at the understanding of the socio-spatial dialectic operating in that socio-spatial field. A different understanding of culture might lead to a different framework within which the criteria of the experimentation are set up. After catching fish, however, networks are useless and what kind of networks are used matters little in the end. But one thing which must never be given up is that the conceptual framework as the basis of the experimentation should be logically consistent and coherent and should be drawn from a deep cultural understanding of the community in question. In this respect, the analysis of networks and its interpretation must be a continuous process of the same controlled experimentation but not an automatic rule-bound operation.

Though some principles of reading plans have been set out, these by no means apply exhaustively to every case as the socio-spatial grammar varies subtly from case to case. Only the subjective interpretation based on the cultural understanding of the community can fill this latent gap. Once networks are produced, which of their graph-theoretic aspects can suggest the relevant explanations of the socio-spatial dialectic still need to be worked out before they are used for the analysis in the next chapter.

## CHAPTER 8. THE TOPOLOGICAL STRUCTURE OF THE SOCIO-SPATIAL FIELD OF COMMUNICATION

### 8.0. INTRODUCTION.

To investigate how two poles of the socio-spatial field of communication interact, we need to discover the structural properties of individual region graphs. These are regarded as the loci of energy-information transactions activated in the socio-spatial dialectic of a community. The measurement of these structural parameters will be pursued by examining the interrelation between the opposite but complementary processes of space organisation : differentiation and integration. Firstly, we look into the relation between the intensity of spatial differentiation( $\alpha$ ) and the degree of connection( $\beta$ ) between differentiated individual regions. Secondly, the property of mutual segregation( $\gamma$ ) of interior and exterior regions of space organisations and their integration( $\sigma$ ) into a whole will be examined. Thirdly, the relation of rigidity and flexibility( $\delta$ ) and further organicity( $\lambda$ ) of space organisations will be examined as these appear as systems of pathways of energy-information. All the values of these structural parameters calculated for each house compound in the surveyed villages will be given in Appendix T.

In the following three sections, we concentrate on the frameworks and formulae for measuring these parameters and on their possible interpretations in the socio-spatial dialectic before we move on to the explanation of the interrelations of these parameters drawn from their values for a large number of house compounds. The formulae will provide frameworks within which the topological relations of individual regions are measured. Real examples given for each measure will expose the possibilities and limitations in interpreting the measured values. Then statistical analyses follow to examine the collective properties of individual values of

the structural parameters measured for each house compound of the surveyed villages, especially focussing on the spread of values and the correlation of structural parameters. These statistical analyses are intended to give a wider scope for interpreting a community as a whole field of socio-spatial communication as well as deepening the understanding initially worked out through the process of building models for measuring the structural parameters. We hope that these complementary procedures of investigation will provide a general understanding of the interaction of the two poles of the socio-spatial field of communication, going beyond the explanation of Korean traditional villages into the universal nature of the socio-spatial dialectic.

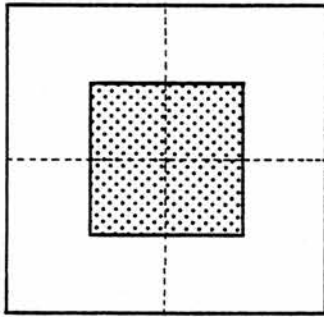
### 8.1. DIFFERENTIATION AND CONNECTION

As we have consistently argued, the differentiation of space into individual regions and integration of these into an organised whole are the opposite but complementary processes in the socio-spatial field of communication. With all the constraints operating in this field as argued in chapter 6, people have to accommodate their functional and social needs through the proper allocation of their activities by organising the limited surface area available. Above all, especially for house compounds, the erection of buildings within a site precedes and is prior to the other activities of space organisation. In this respect, the construction of buildings within a site may be considered as the primary activity of spatial differentiation and others that follow as the secondary. As much as this building activity is the initiation point of spatial differentiation it also immediately includes in itself the opposite but complementary process of integration. Whenever a building activity implies distinction, division, compartmentalisation, and enclosure of spaces it also means the integration of individual regions thus differentiated into an organised whole by connecting them in one way or another.

### 8.1.1. The Intensity of Differentiation

Given a site of a fixed size, how finely or coarsely do people of a community differentiate space into individual regions by their building activities? The answer to this question may reveal the characteristic density of individual regions created by a community to order the functional and social categories in their life space. Alternatively, it may be regarded as the degree of spatial differentiation in that socio-spatial field of communication. The intensity of differentiation will be measured by the multiplication of two values : the number of individual regions and the building coverage ratio. This is represented by the formula  $\alpha = V \cdot B / S$  where  $\alpha$  stands for the intensity of differentiation, V for the number of individual regions, S for the site area of the house compound, and B for the total building area. The site areas(S) of house compounds are the averages of 6 measurements executed by using a planimeter on the house compound plans presented in Appendix I. For the calculation of building areas(B), original surveyed plans of 1/100 scale were used. All the values of S and B are given in Appendix T-1. Let us illustrate the implications of this measure by giving some simplified schematic examples. As shown in the conceptual diagrams of fig. 8-1, (a) & (b), we consider a house compound with a fixed number of individual regions and a fixed site area S of 4 units. When the values of V and S are constant, the intensity of differentiation increases in relation to the increment of building area as shown in (a) and (b) of fig. 8-1. Obviously the number of individual regions itself indicates the absolute value of the grain of differentiation for that house compound. But this absolute value is modified by the value of the building coverage ratio to produce relative indices which are comparable between different house compounds. This consideration presupposes that for a given site, the number of individual regions increases in parallel with the increment of building area.


We can show the implications of this measure more specifically through the schematic examples (c), (d), & (e) of fig. 8-1. Here,




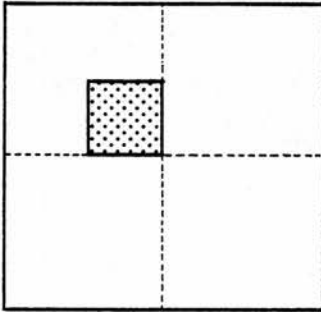
(a)

$$V = 4 \quad S = 4 \quad B = 1$$

$$\alpha = V \cdot B / S = 4 \cdot 1 / 4 = 1$$

Key :     : Built-up area

 : Site

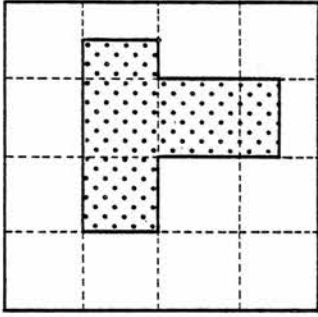


(b)

$$V = 4 \quad S = 4 \quad B = 1/4$$

$$\alpha = V \cdot B / S = 4 \cdot 1 / 16 = 1/4$$

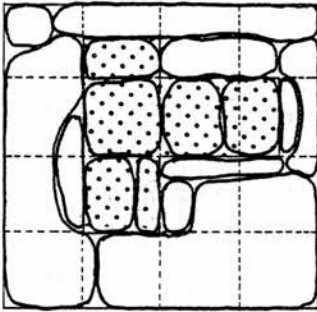
Fig. 8-1. The measure of the intensity of differentiation( $\alpha$ ).



(c)

$$S = 4 \quad B = 1$$

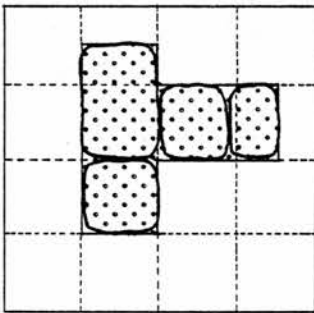
Key :  $\cdot\cdot\cdot$  : Built-up area  
 $\square$  : Site  
 $\bigcirc$  : Individual region



(d)

$$S = 4 \quad B = 1 \quad V = 16$$

$$V/S = 16/4 = 4$$



(e)

$$\alpha = V/S \cdot B = 4 \cdot 1 = 4$$

Fig. 8-1. The measure of the intensity of differentiation ( $\alpha$ ).



the value measured by  $V/S$  indicates the number of individual regions per unit site area. This value may be considered as the density of individual regions, whereby both the primary and secondary activities are equally taken into account in the differentiation of space. The intensity of differentiation which is given by multiplying the value of  $V/S$  by the building area equals the building area replaced by the number of individual regions in accordance with the density of individual regions of the space organisation. Accordingly, the intensity of differentiation may be considered as the measurement of the primary activities of spatial differentiation expressed in the quantitative terms for the individual regions of a space organisation under consideration.

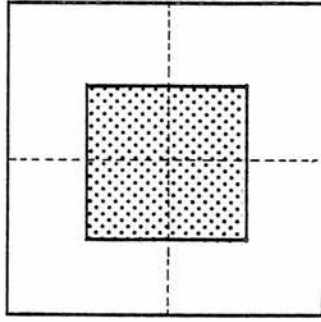
It is worthwhile to examine further the general nature of differentiation in relation to building activities to understand better the grain of differentiation. As argued in section 6.3., sites and building areas are relevant to the socio-spatial field of communication only as the ground or floor surface into which the life space is rooted and by which this is defined. We can assume the hypothetical case where the building coverage ratio is fixed, that is, the building area is constant in a given site, with changes only in the number of individual regions. For whatever reasons, when an increase in the number of individual regions occurs without a change in the size of building area, the result is an increase in the total length of boundaries of individual regions, as shown in the diagrams of fig. 8-2. Biologists have already dealt with this matter in the problem of growth and form of organisms. They noticed three general solutions to the problem imposed by the decreasing ratio of surface area to volume with the growth of organisms maintaining their integrity :<sup>(1)</sup>

- a) The differential increase of surfaces by complication of structure — branching, convolution, etc..
- b) The differential increase of surfaces by change in shape without complication of structure — attenuation, flattening, etc..
- c) The incorporation of inactive organic matter within the volume occupied.

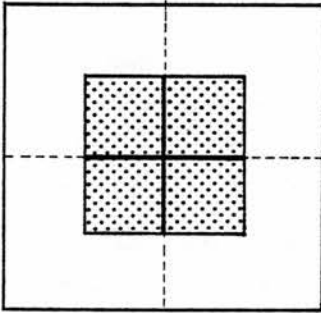
This observation presents a useful insight, though we are concerned with the relation between the total length of boundaries and floor area of space organisations and not with the ratio of surface area to volume.

With the increasing number of differentiated individual regions while at the same time preserving the total building area or maintaining the building area at its minimum, there will generally be two directions of solution : either through the internal division of the building area(fig. 8-2, (b)) or through the external attenuation of shape(fig. 8-2, (d)). Further developments in two directions will lead to the cell division(fig. 8-2, (c)) and branching(fig. 8-2, (e)) respectively. But, in real life spaces, these two directions of solution are inter-mingled and whichever direction of solution the process of spatial organisation undergoes is a matter of degree. Furthermore, the reciprocal directions of the process (c)  $\rightarrow$  (b)  $\rightarrow$  (a) and (e)  $\rightarrow$  (d)  $\rightarrow$  (a) are equally probable. As shown in fig. 8-2, along the axis of division/unification, the requirement of an increase of the total length of boundaries resulting from the differentiation of individual regions is met by the internal division of space organisation (b). These may further be segregated into separate space organisations. Also, the reverse process from (c) through (b) to (a) will take place when the space organisation of separate structures are unified into one to carry out energy-information transactions effectively.

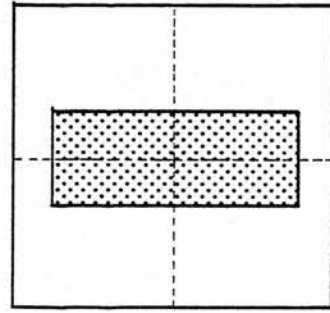
In parallel with the division/unification process, the density of differentiation of the exterior region may also be increased through the increased connectivity between the interior and exterior regions as in (b) and by the division of exterior regions created by the segregated interior regions as in (c). On the other hand, along the axis of attenuation/contraction process, the same requirement is met by the enlongation of boundaries in contact with exterior regions as in (d) and further by branching as in (e). Also the reverse process of contraction from (e) through (d) to (a) will occur when the process of space organisation for



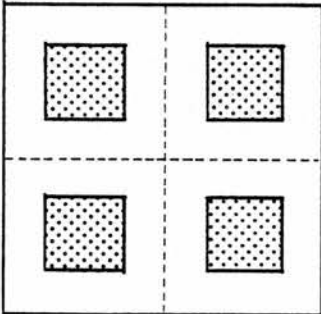
(a) Building area/Site area = Constant



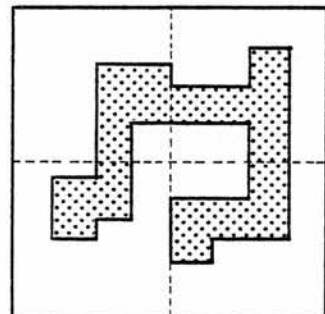
(b) Internal subdivision



(d) Attenuation



(c) Cell Division



(e) Branching



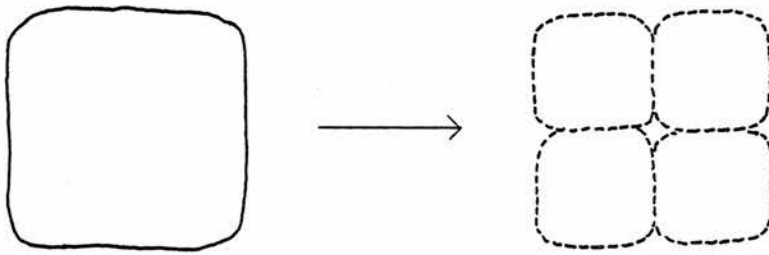
Fig. 8-2. Two directions of solution for the increased degree of differentiation.

energy-information transactions necessitates a solution towards the other direction. In this case, the density of differentiation for the exterior region is enhanced either through the increased possibility of interaction between interior and exterior regions as in (d) or by the division of the exterior region resulting from the enclosure effects of branching as in (e). Thus the processes of differentiation of exterior regions and interior regions mutually affect each other.

In the example of house compound S014 shown in fig. 7-9, in section 7.2., we discussed the problem of the differentiation of proportionately over-large space into multiple regions in a rather intuitive manner. We may now draw a more detailed picture of the differentiation of space by considering the implications of the principle of least effort discussed in section 3.2..

For the containment of any functional and social categories in an individual region, the most energy-economic way will be to allocate the minimum floor area for this purpose with minimum redundant spaces. The process towards achieving this will lead to the differentiation of a space into multiple regions when there is an unacceptable degree of redundancy in space use as shown schematically in fig. 8-3, (a). Once the minimum floor area for the containment of the necessary functional and social activities has been achieved, the further step towards the goal of minimum energy expenditure would be towards minimising the boundary to area ratio. With this momentum of spatial differentiation operating, the differentiation of an oblong shape into multiple regions as shown in fig. 8-3, (b), would be the next step. It would be realistic to regard these two momenta of spatial differentiation as working together in the real life space.

In trying to understand the socio-spatial dialectic it would be misleading to adopt these biological analogies and the minimum energy principle at their face value in identification of individual regions in the real life space. Nevertheless, they are fundamental



(a)



(b)

Fig. 8-3. The differentiation of space under the minimum-energy principle.

bases of spatial differentiation insofar as we cannot ignore the domain of nature in the socio-spatial dialectic. The final manifestation of spatial differentiation depends on how people of a community transform these constraints from the domain of nature into media for ordering functional and social categories within their life space. A true understanding of spatial differentiation will only emerge when we look into how people use their life space to carry out their daily activities by absorbing these physical constraints through their cultural ideologies.

If we take as examples Y1 and Y43, shown in figs. 8-4 and 8-5, the numbers of individual regions identified for each house compound are 58 and 13 respectively. Though the number of individual regions of Y1 is over four times that of Y43, the difference in the intensities of differentiation are 5.85 and 2.68 respectively, as shown in table 8-1.

Table 8-1. The intensity of differentiation( $\alpha$ ) of Y1 and Y43.

house compounds	number of individual regions (V)	building area (B;sq.m)	site area (S;sq.m)	building coverage ratio (B/S)	the degree of differentiation ( $\alpha$ )
Y1	58	221.14	2192.57	0.1009	5.85
Y43	13	37.24	180.74	0.2060	2.68

This is because the building coverage ratio of Y43 is about twice that of Y1. While the building and site areas of Y1 are substantially larger than those of Y43 and as a result the number of regions actually differentiated is far greater in Y1 than in Y43, the difference in the effective degree of differentiation is not so much as a result of the stronger rate of primary differentiation in terms of the building and site areas. From these examples we can assume that, in the Yang-Ban house compound Y1, the greater proportion of differentiation is accomplished by the secondary nature of differentiation after the construction of buildings within

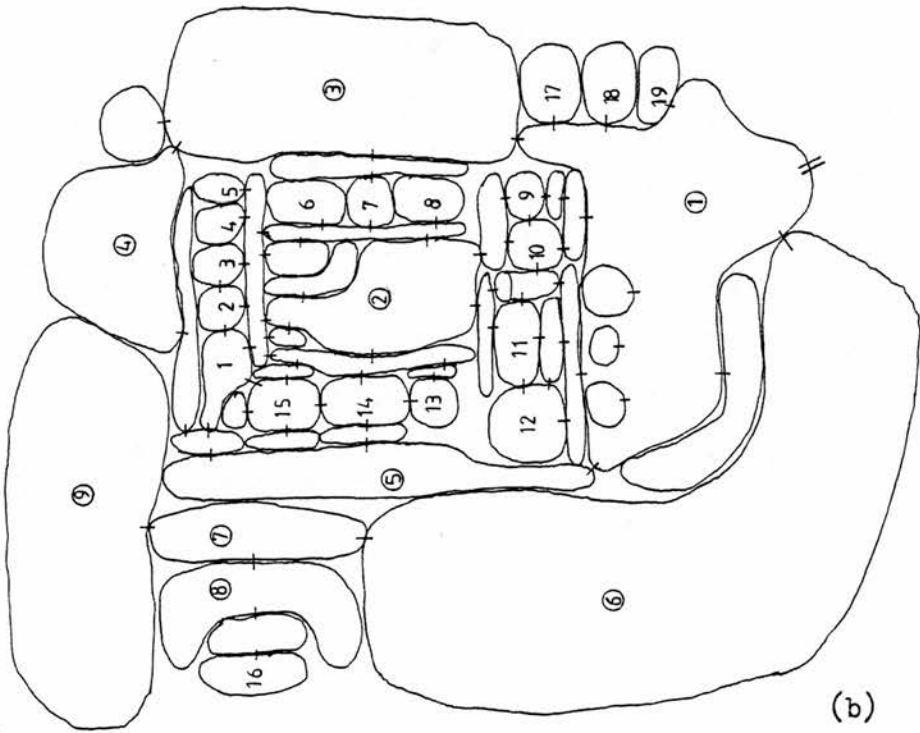
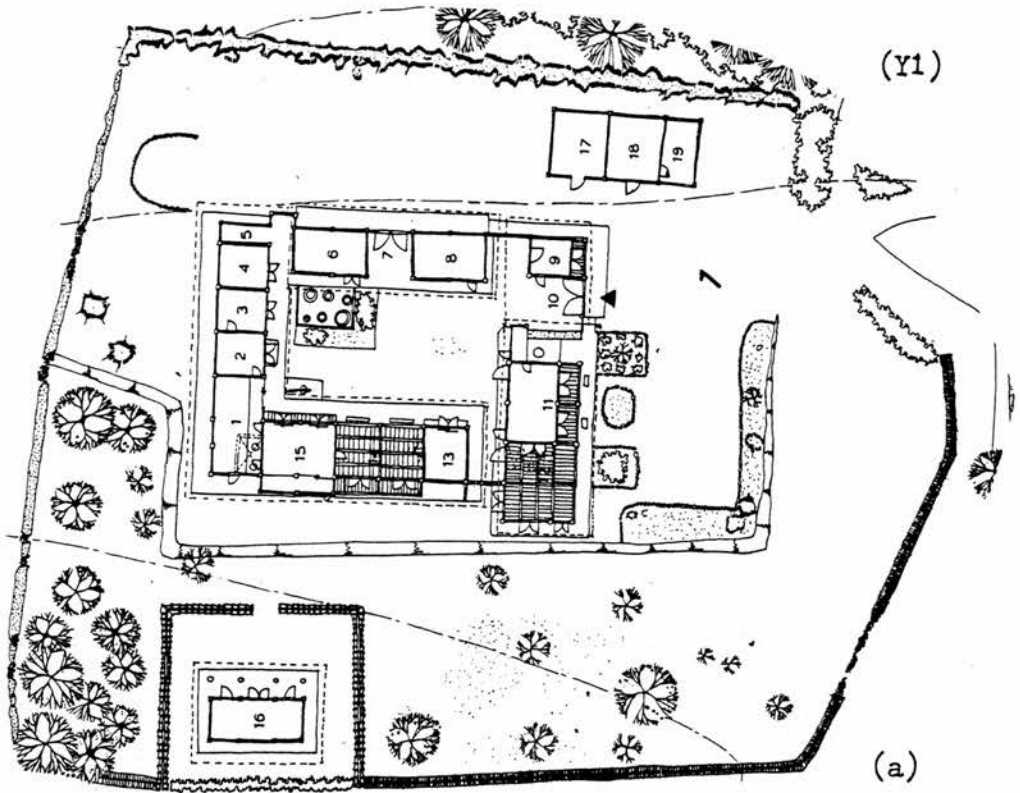
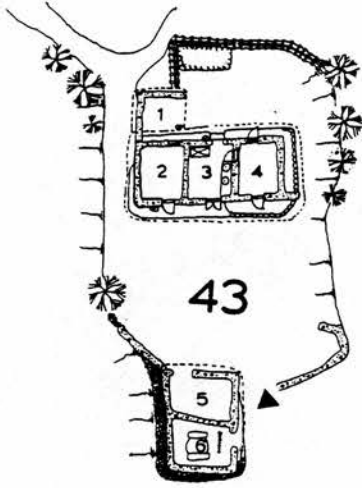
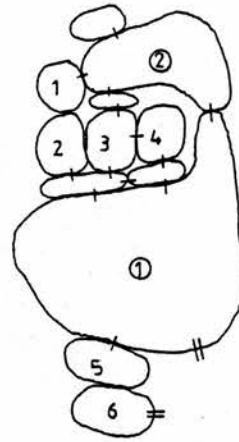


Fig. 8-4. The plan and individual region map of Y1.

(Y43)



(a)



(b)

Fig. 8-5. The plan and individual region map of Y43.



a site than in the Sang-Min house compound Y43. It might be argued that the Sang-Min house compounds tend to have a stronger building coverage ratio since the Sang-Min could only afford small plots and therefore it is tautological to say that the Sang-Min people are more attached to the primary differentiation of their life space. This may be true to a degree but we cannot disregard that they also could not afford more than a minimum size of buildings within their site.

Concerning the intensity of differentiation in Korean traditional villages, we may extend these findings from typical examples to assume that though the space organisation of high culture ideology possesses far higher values in the dimensions of site and building area and the number of spaces(rooms) compared with that of folk culture, its effective rate of the intensity of differentiation is not that much higher when taking into account the latter's strong attachment to the primary aspect of differentiation. This fact is reflected in the higher values in both the density of individual regions( $V/S$ ) and the building coverage ratio for Y43 than those of Y1. The conclusions derived from particular examples in this and following sections can only be extended to general hypotheses concerning the interacting two poles of socio-spatial field of communication after investigating, in section 8.4., the collective properties of each structural parameters as a whole in the village communities.

#### 8.1.2. The Degree of Connection

Differentiated individual regions must be connected in one way or another to become integrated into one whole space organisation. The chain of connections between neighbouring individual regions of a space organisation also implies the existence of its opposite but complementary structure, that is, the system of disconnections between neighbouring individual regions. Connections and disconnections between individual regions are the prerequisite for the energy-information transactions in people's activities. As

any individual region pertains to certain functional and social categories, the organisation of these into structured relations through connections and disconnections must be functionally efficient and socially acceptable. An understanding of the fundamental properties of this connectivity is essential to come to grips with the socio-spatial dialectic in that socio-spatial field of communication.

The intensity or degree of connection is the most basic and simple measure of connectivity. The degree of connection of a space organisation may be measured by the ratio of the number of actual connections to the maximum possible number for a given number of individual regions. This measure is represented by the formula  $\beta = E/3V-6$ <sup>(2)</sup> where  $\beta$  is the degree of connection, E the number of connections, and V the number of individual regions respectively. The maximum possible number of connections has no meaning for any particular house compound ; for even a slight change in the connectivity condition gives a quite different space organisation. For the property of connectivity of a space organisation itself alone, the average valency  $2E/V$  may be more descriptively accurate. But, for the purpose of comparison between space organisations which generally have differing number of individual regions,  $\beta$  values may be more relevant as the possible number of connections varies according to the number of individual regions.

By taking examples, we can clarify the limitations and possibilities which the value of  $\beta$  can suggest as the parameter indicating the degree of connection of a space organisation. Let us take two cases having four and five individual regions respectively. For the first case, as shown in fig. 8-6, the values of valency( $2E/V$ ) range from 1.5 to 3 while those of  $\beta$  range from 0.5 to 1. For the case with five individual regions, the values of valency range from 1.6 to 3.6 while those of  $\beta$  range from  $4/9$  to 1 as shown in fig. 8-7. As the number of edges of any individual region graph varies between  $V-1 < E < 3V-6$ , the ranges of valency and of values of  $\beta$  are given by dividing the number of edges respectively

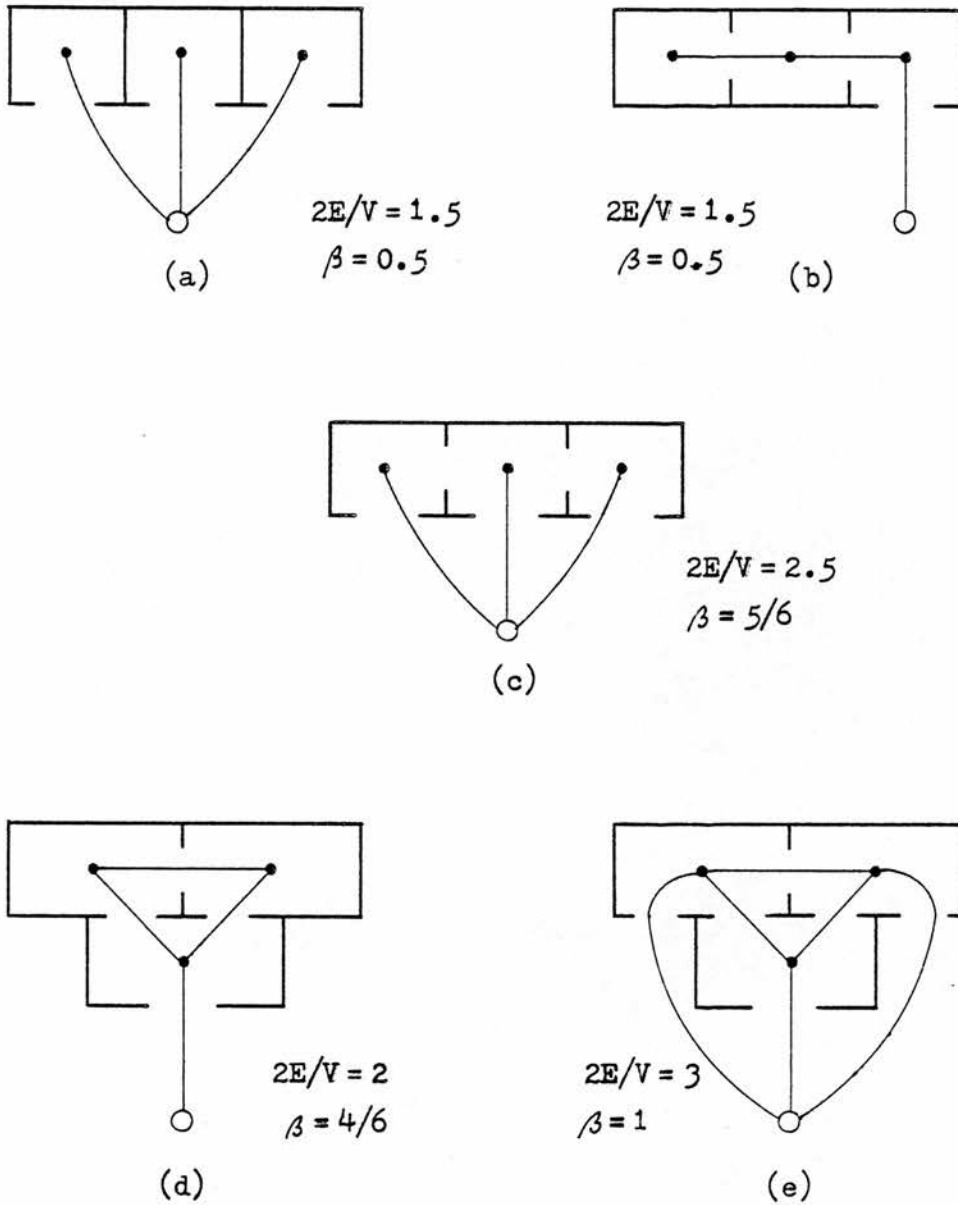


Fig. 8-6. The range of values for the degree of connection ( $\beta$ ) and the valency ( $2E/V$ ) for space organisation with four individual regions.

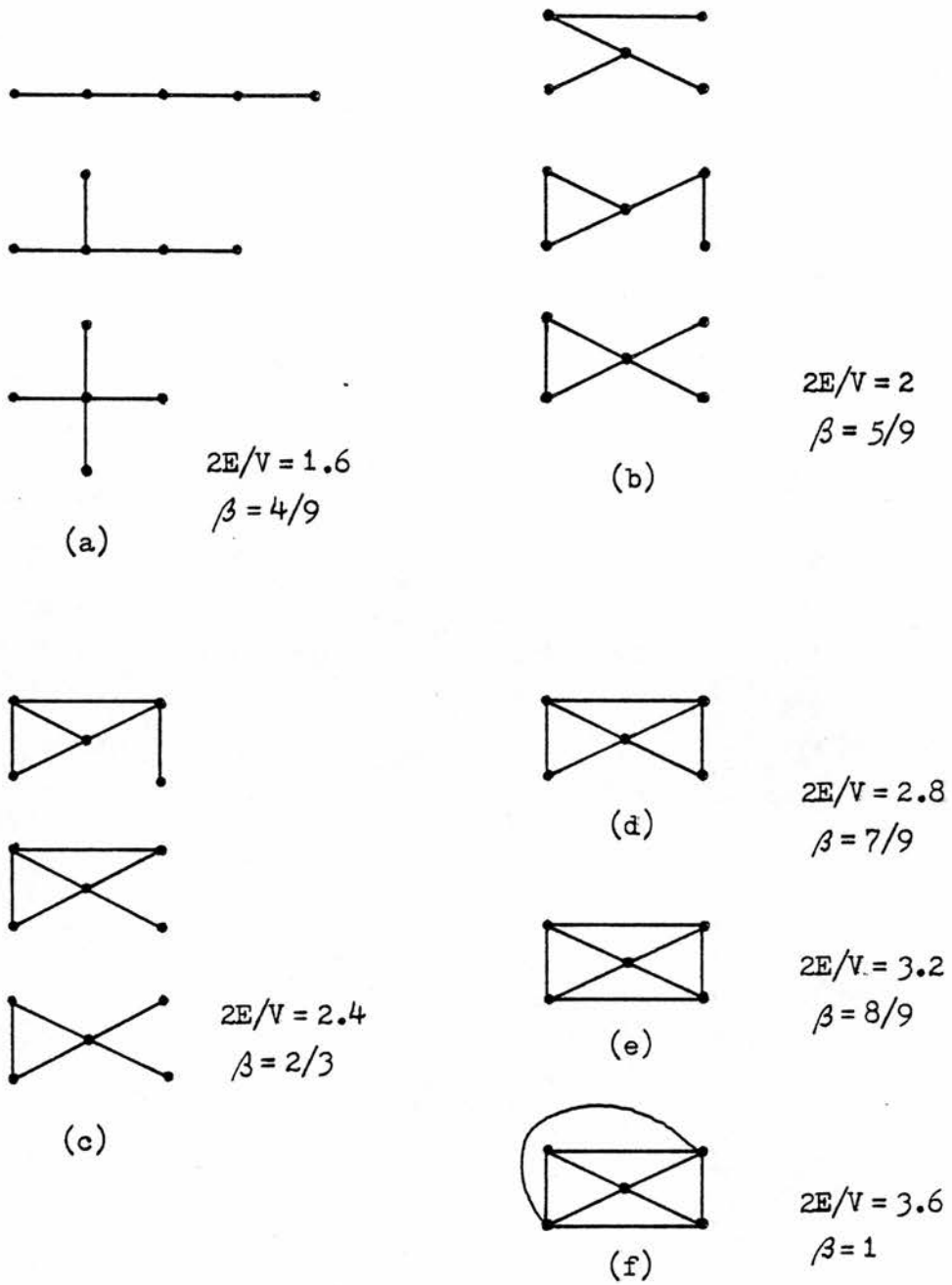


Fig. 8-7. The range of values for the degree of connection( $\beta$ ) and the valency( $2E/V$ ) for space organisations with five individual regions.

by  $V/2$  and  $3V-6$  resulting in  $0 \leq 2E/V < 6$  for the valency and  $0 \leq \beta \leq 1$  for  $\beta$ . But, as every space organisation consists at least of two individual regions in the real life space, the values of valency equal to or greater than  $1/2$  and less than 6. As the number of individual regions approaches infinity, the range of valency approaches the interval from 2 to 6 while that of the degree of connection approaches  $1/3$  for its lower range and 1 for its upper range. These are the values which are to be considered when comparing the connectivities of different space organisations. For the values of valency, both the values of the lower and upper limits vary according to the number of individual regions. But, for the degree of connection, the value of upper range is limited to 1 for every space organisation while that of lower range varies in relation to the number of individual regions.

Let us take examples of Y1 and Y43 as shown in the individual region graphs of fig. 8-8 and table 8-2. Here, inspite of all the differences between the two house compounds in their characters of differentiation and plans as discussed in the last section(8.1.1.) and shown in figs. 8-4 & 8-5, both have the same value of 0.45 for the degree of connection. This example well illustrates

Table 8-2. The degree of connection( $\beta$ ) of Y1 and Y43.

house compounds	number of individual regions(V)	number of connections(E)	The degree of connection( $\beta$ )
Y1	58	77	0.46
Y43	13	15	0.45

how far different space organisations with distinctive social bases and distinguished surface manifestations in fact can have the similar or same properties in the connection of individual regions into an organised whole for transactions of energy-information. At this stage of investigation, we may subsume that there might be optimal range of connectivity in certain species of the socio-spatial field of communication as a whole.

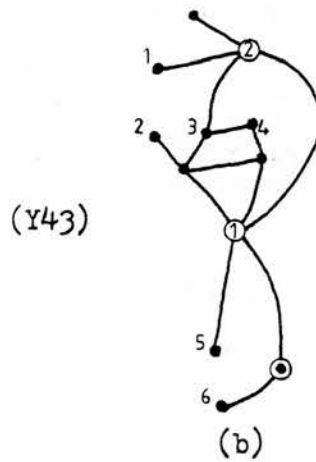
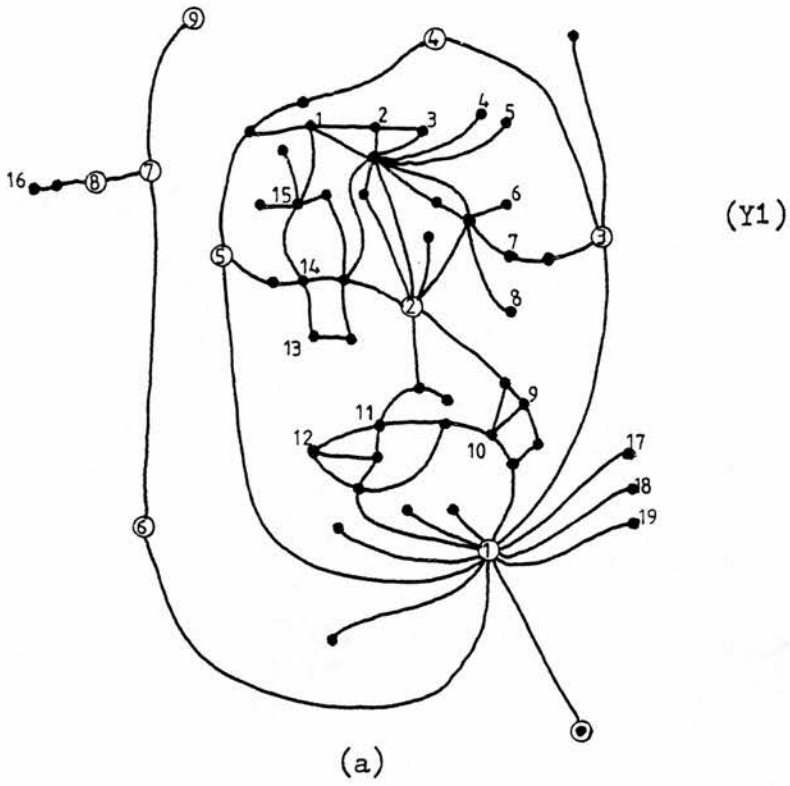


Fig. 8-8. The individual region graphs of Y1 and Y43.

## 8.2. SEGREGATION AND INTEGRATION

As we discussed in chapter 4, the differentiation of space into interior and exterior is archetypal. The provision of an inner world is the origin of the differentiation of space whereby a reference point comes into being in the midst of unknown world outside. In a very general sense, the individual region of space comes to mean an interior domain with its own self-identity distinguished from the undifferentiated domain of its exterior. This archetypal meaning of the distinction of space between interior and exterior pervades all aspects of the differentiation of space. The distinction is defined by physical and social means of separation and connection of individual regions of space.

This distinction carries relative meanings rather than absolute ones. For example, a village as a whole comes to mean an interior world against the outside world beyond the village and in turn a house compound is an interior domain surrounded by the rest of the village environment. Within the house compound, court yards are exterior to the sheltered spaces and so on. At each of these levels of consideration, the intensity of interiority of an individual region of space may be attributed by the amount of physical and social resistances which are required for the access to that space from another.

In our study, we will concentrate on the distinction between interior and exterior within house compounds at the fundamental level at which the distinction is clearly defined physically as well as socio-culturally. Although we will not generally make use of labelling in graph-theoretic representations, for this only will we apply a means of representation which distinguishes between interior and exterior. Here, the individual region of interior space does not refer to a portion of sheltered indoor space as such but to a space with functional integrity produced by more or less permanently built structures. Thus it includes for example such spaces as Jangdokdai(space No. 36 of Y15 in fig. 6-8), Washing area(space No.

37 of Y15 in fig. 6-8), and semi-outdoor spaces. The individual region of exterior space, however, refers to a space with a functional integrity in the outdoor yards of house compounds, which especially has no permanent structures. The exterior individual regions are more fluid than those of interior space because they are subject to frequent change according to the requirements of daily life. Moreover, the allocation of social categories for exterior individual regions of space is more loosely defined than for interior spaces. In this respect, exterior spaces within house compounds may be said to be loosely differentiated and remain closer to the domain of nature than to the domain of culture.

Interior regions are the domains which are artificially defined through cultural conventions in a more or less fixed framework. Interior individual regions are relatively more distanced from nature compared with those of exterior space. Exterior regions are more exposed to the operation of nature so that their functional and social categories more easily slip from conscious design. Interior and exterior spaces as the most distinctive categories of spatial differentiation are complementary as much as they are opposed to each other in their nature/culture interaction. In the house compounds of villages, groups of connected exterior spaces integrate sets of connected interior spaces into one whole in that the exterior spaces act as mediators connecting the separated groups of interior spaces. At the same time, groups of connected exterior spaces segregate groups of connected interior spaces in the sense that the exterior space operates as the most effective medium for separating interior spaces. We can turn these assertions the other way round to obtain consistent statements by interchanging the terms 'interior' and 'exterior' without damaging the logical coherence.

For the effective measurement and analysis in the present(8.2.) and following (8.3.) sections, we need to introduce the idea of structure graph for its explanatory values in simplifying repetitive relations occurring in the graphs. For the purpose of the analysis



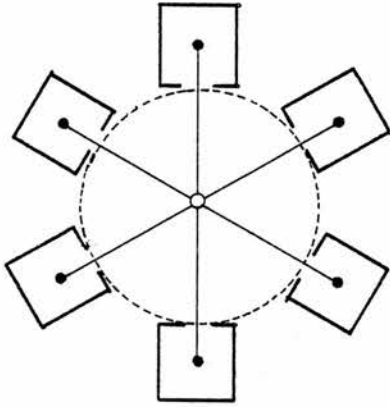
of networks, we might need to represent a collection of vertices with some equivalent properties of connectivity as a unit. A set of individual regions of space composing a unitary whole can be divided into some subsets of individual regions of space which are equally included in a certain range of properties of connectivity. This aggregation of the individual regions of space under the same connectivity conditions may be called a cluster. We can represent a subgraph which consists of the vertices of equivalent relations (cluster) by a vertex and connect these vertices each of which represents this subgraph whenever there occurs at least one connection between these in the network. Thus constructed graph may be called a structure graph. By using structure graphs, we can more easily analyse the structural properties of networks. If we refer to the connected subgraphs of a disconnected graph as components, connected interior regions and connected exterior regions can be considered as components which are disconnected mutually by the other. Each component as a cluster of individual regions can be represented by one vertex, as shown in fig. 8-9. To simplify the representation of the structure graph, multiple edges between clusters can be represented by the number of edges in a bracket as shown in fig. 8-10. The structure graph representing relations between the interior and exterior regions, as dealt with in this section, may be called the interior-exterior structure graph. All the I-E structure graphs of house compounds of the four Korean villages are given in Appendix IV.

### 8.2.1. The Degree of Segregation

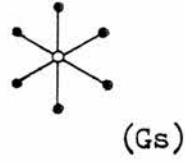
We adopt some basic concepts of graph theory and adapt these to apply to the analysis of the networks to enquire about the differentiation of space into interior and exterior and their integration in the socio-spatial field of communication. Concerning this subject matter, the relevant mathematical ideas and a working example which applies these to the analysis of house compounds will be presented in Appendix M. In the socio-spatial field of communication, the collections of maximum number of

connected individual regions of interior space cannot be integrated into a whole of the space organisation without the mediation of exterior space. Also those of exterior space cannot be included in the space organisation as a unit whole without their connections with individual regions of space of interior domain. If we use the symbol  $C_I$  for the number of the collections of maximum number of connected individual regions of interior space and  $C_E$  for the number of the collections of maximum number of connected individual regions of exterior space, the ratio  $\delta = C_I/C_E$  shows how much the space organisation is segregated or more specifically how much the interior domain of the space organisation is segregated by the exterior domain. The reciprocal of  $\delta$  will show the inverse point of view in which the roles of interior and exterior domains of space are interchanged in the segregation and integration of space.

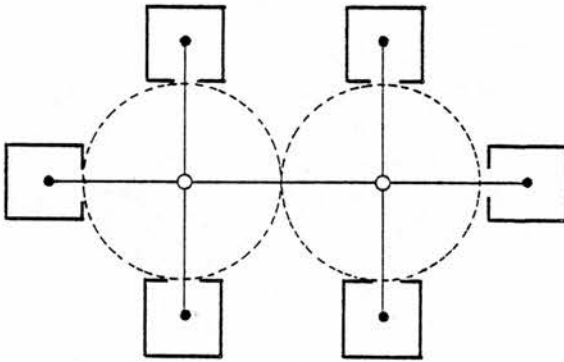
For the convenience of illustration, we can think of a space organisation which is composed of six interior individual regions and some exterior regions as in fig. 8-9. If the interior individual regions are all segregated and each of them is connected to one exterior region as shown in fig. 8-9, (a), the value of  $\delta$  is 6. Also, if the same number of segregated interior regions are connected separately to two connected exterior regions which belong to one component as shown in fig. 8-9, (b), the value of  $\delta$  is still 6. This unchanging value of  $\delta$  is clearly illustrated by the same structure graphs of both cases. This simple illustration shows that the value of  $\delta$  as the measure of segregation do not take into account the numbers of individual regions of both interior and exterior regions but those of connected clusters of them. The next illustration makes this point clearer. In (c) of fig. 8-9, when all the six interior regions are connected as one component and this component is connected to one exterior region, the value of  $\delta$  is 1. And if those six regions are clustered into two separate components and each of them is connected to the same one exterior region as shown in fig. 8-9, (d), the value of  $\delta$  is 2. On the other hand, if the six interior regions are clustered into two separate components and these are connected to two separate



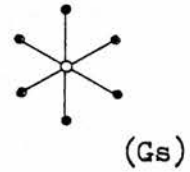
$C_E = 1$   
 $C_I = 6$   
 $\zeta = 6$



(a)



$C_E = 1$   
 $C_I = 6$   
 $\zeta = 6$

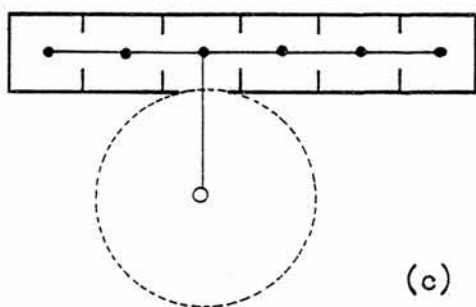


(b)

Key :

- Vertex symbolising the exterior individual region
- Vertex symbolising the interior individual region
- (Gs) Interior-exterior structure graph
- Exterior individual region
- Interior individual region

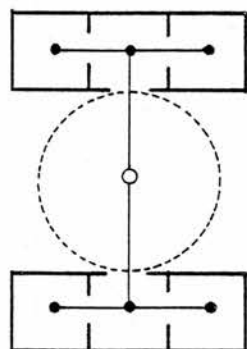
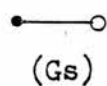
Fig. 8-9. The degree of segregation between interior and exterior regions ( $\zeta$ ).



$$C_E = 1$$

$$C_I = 1$$

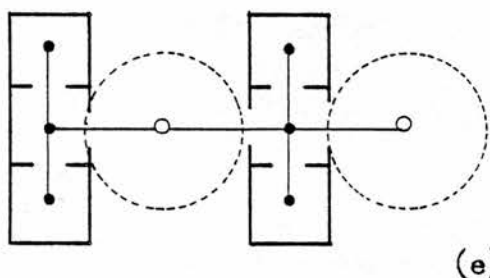
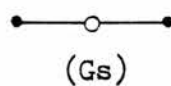
$$\zeta = 1$$



$$C_E = 1$$

$$C_I = 2$$

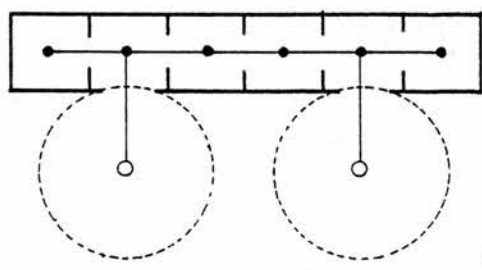
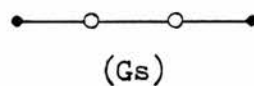
$$\zeta = 2$$



$$C_E = 2$$

$$C_I = 2$$

$$\zeta = 1$$



$$C_E = 2$$

$$C_I = 1$$

$$\zeta = 2/1$$

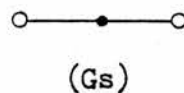
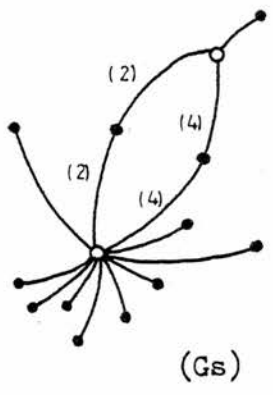
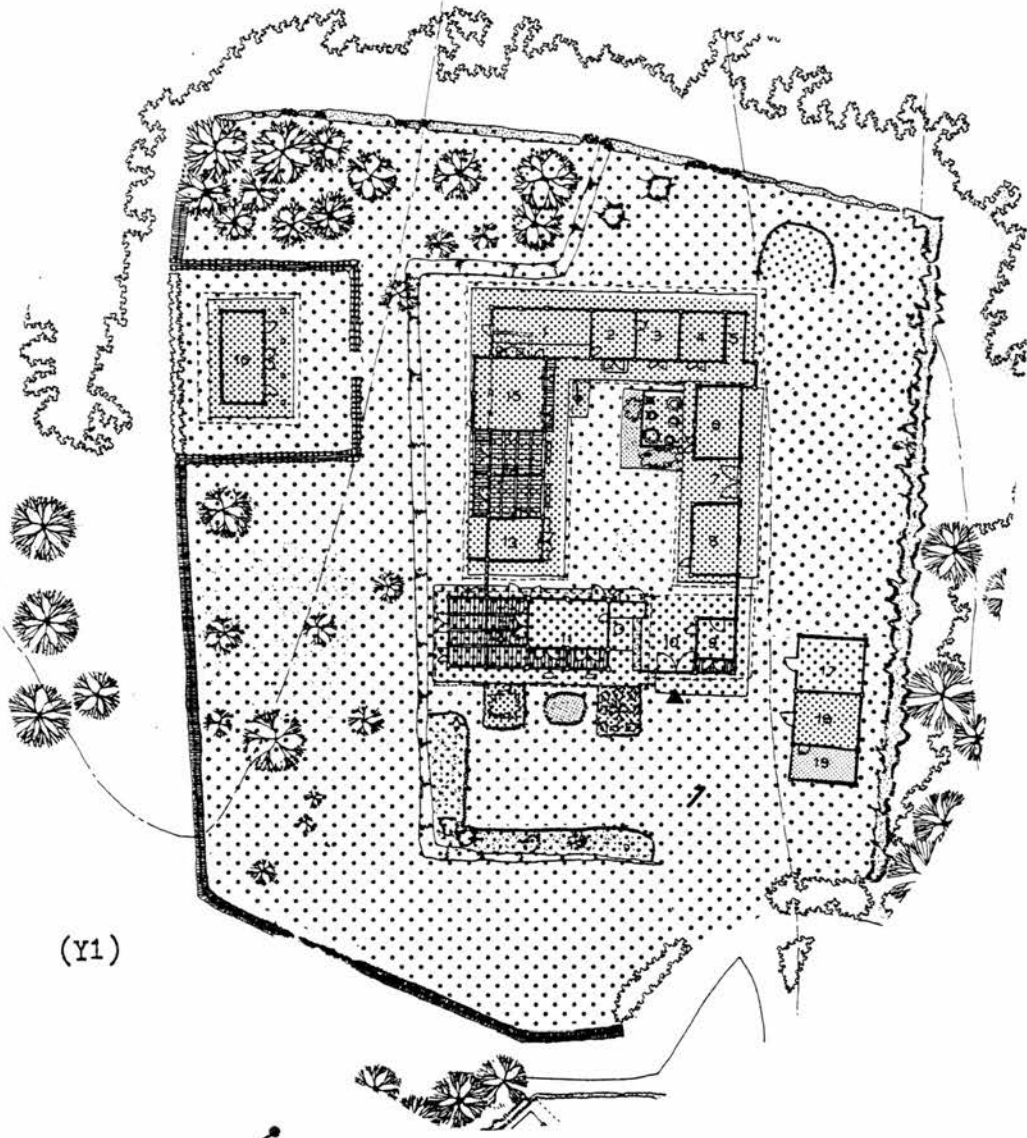


Fig. 8-9. The degree of segregation between interior and exterior regions( $\zeta$ ).



components of exterior region, as shown in (e) of fig. 8-9, the value of  $\zeta$  equals 1. This value, 1, implies that interior regions and exterior regions segregate evenly their counter-part in the space organisation. When the value of  $\zeta$  exceeds 1 as in the cases of (a), (b), and (d) of fig. 8-9, this implies that clusters of interior regions are more segregated by clusters of exterior regions than vice versa. If the value of  $\zeta$  goes down to less than 1 as in the case of fig. 8-9, (f), this means that clusters of exterior regions are more connected through the medium of clusters of interior regions in that space organisation than vice versa. These relations between exterior and interior spaces can be more easily read through the interior-exterior structure graphs drawn from the original individual region graphs.

Let us take examples of five house compounds, two from Yangdong and three from Seommaeul, as shown in fig. 8-10 where clusters of exterior and interior regions are indicated in the plan and the interior-exterior structure graph is given for each house compound. As shown in both fig. 8-10, (a) & (b) and table 8-3, out of these five house compounds Y1 has the highest value(6) for the degree of segregation while SE12 has the lowest(2), which tell us that one cluster of exterior regions is connected to the average of 6 clusters of interior regions in the house compound Y1 and to those of 2 in the house compound of SE12 respectively. In the case of SE4 and SE63, though the house compound SE4 has twice as many clusters of interior regions as the house compound SE63, these have the same degree of segregation of 4 as the number of exterior clusters of SE4 is twice that of SE63. The relative values of this measure between two different house compounds do not give any idea of the difference in numbers or size of interior regions but the average number of clusters of connected interior regions per one exterior cluster, which are separated from others of its kind and connected to them through clusters of exterior regions. In so far as the separation between interior regions is only effective through the intervention of exterior regions, the spaces 8 and 9 of SE4 consist a separate cluster independently from the rest of the spaces of the



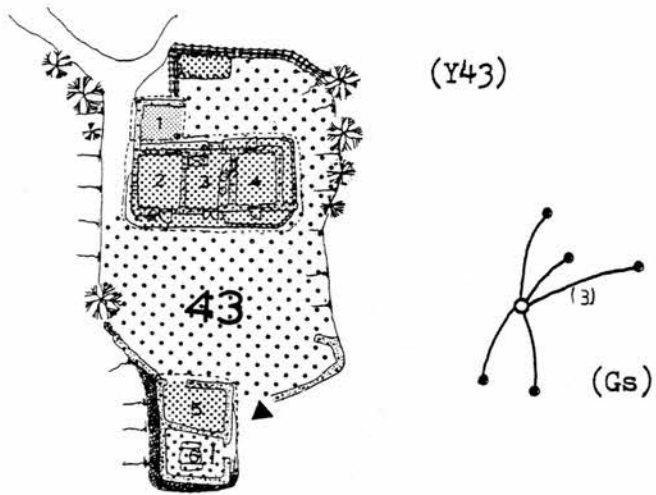
(a)

Key :

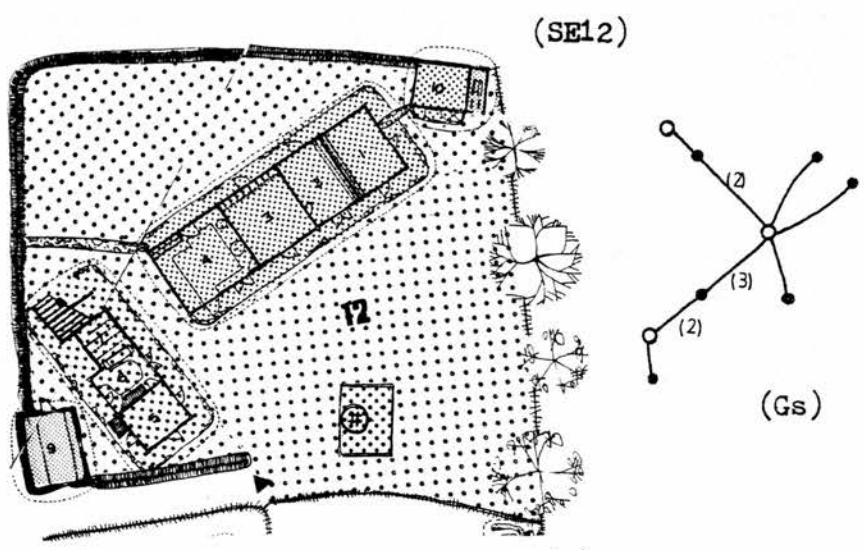
-  The cluster of interior regions
-  The cluster of exterior regions

(Gs) Interior-exterior structure graph

Fig. 8-10. Segregation and integration between interior and exterior regions.



(b)



(c)

Fig. 8-10. Segregation and integration between interior and exterior regions.

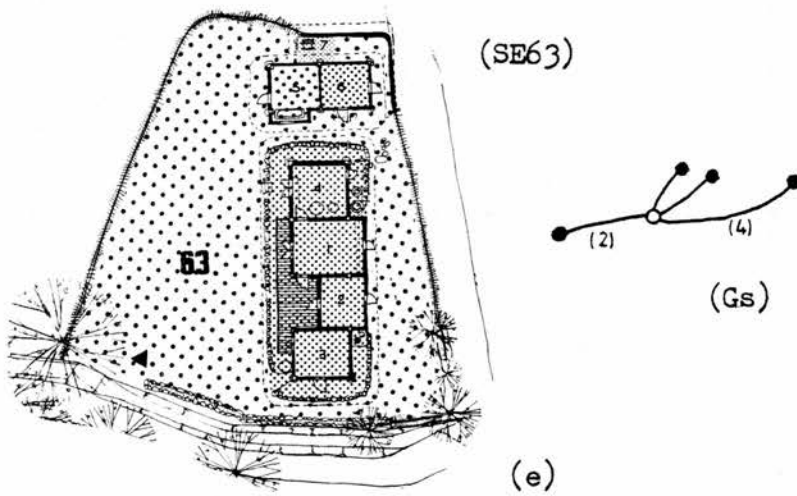
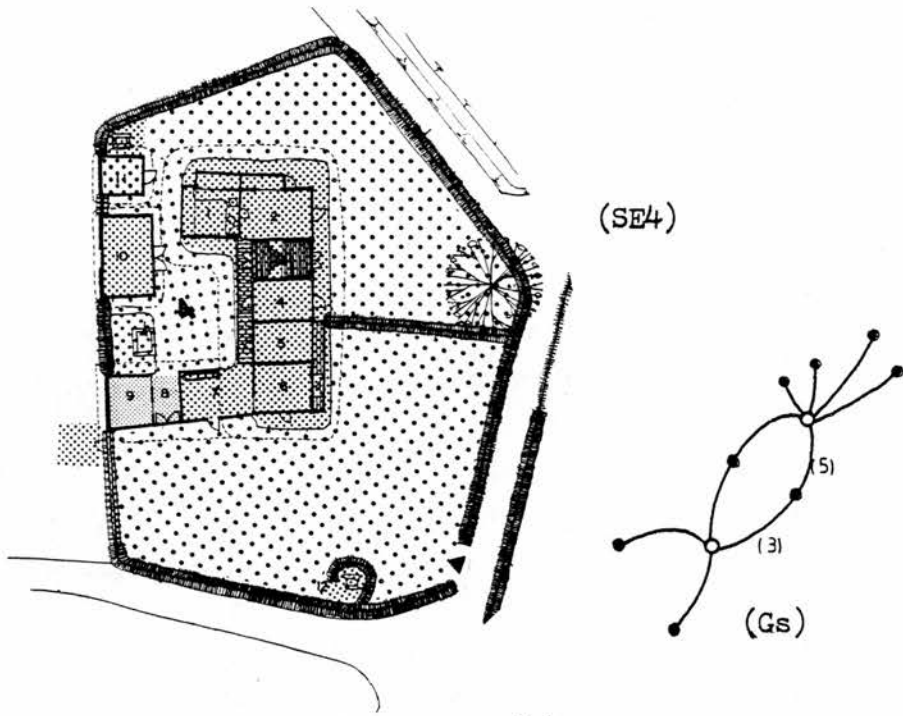


Fig. 8-10. Segregation and integration between interior and exterior regions.



main building though the two spaces structurally belong to the main building. Similar cases are found in spaces 5 and 6 in both Y43 and SE63 where the two spaces of one building consist two separate clusters. In contrast, in the house compound Y1, spaces 6, 7, and

Table 8-3. The degree of segregation( $\zeta$ ) of five house compounds.

house compounds	number of clusters of interior regions ( $C_I$ )	number of clusters of exterior regions ( $C_E$ )	the degree of segregation ( $\zeta$ )
Y1	12	2	6
Y43	5	1	5
SE12	6	3	2
SE4	8	2	4
SE63	4	1	4

8, constituting a separate building from the main block which contains spaces 1 to 5 and 13 to 15, are integrated into a single cluster with the interior regions of the main block through the mediation of base space.

The more interior regions or clusters of interior regions are segregated or connected through a cluster of exterior regions, the more the exterior regions of a house compound function as the mediator between interior regions. Although there could be a big difference between house compounds Y1 and Y43 in the quantity of energy-information exchanged through this mediating role of exterior regions, the importance of exterior regions in each house compound is similar in mediating between interior regions to that of SE12.

In the case of the house compound SE12, if one cluster of exterior regions takes up fewer number of clusters of interior regions or possibly fewer interior regions, exterior regions in that compound come to possess functional and social categories more or less independent from their related interior regions in general and

their interrelation with interior regions directly connected to them are intensified.

### 8.2.2. The Degree of Integration

For any space organisation to function properly, its clusters of interior and exterior regions must be integrated to absorb their opposite but complementary properties into one whole. In the previous section(8.2.1.), we considered the differentiation between interior and exterior regions : the segregation. In this section, we deal with the complementary process of this : that is the integration between interior and exterior regions. In the previous section, we chose a point of view in which the exterior clusters play a pivotal role in the process of segregation, and we maintain, for consistency, the same point of view in considering the process of integration.

We may measure the strength or degree of integration by the ratio of the number of edges between any clusters of exterior regions and those of interior regions to the total number of clusters of exterior individual regions :  $\sigma = E_A / C_E$ . Here,  $\sigma$  refers to the degree of integration between interior and exterior regions,  $E_A$  the number of the edge of attachment between clusters of interior region and those of exterior region, and  $C_E$  the total number of components(clusters) of exterior regions. Let us explain the degree of integration and its implications through schematic examples. As shown in fig. 8-11, (a) and (b), the degree of integration increases with the increase in the number of connections between clusters of the exterior and interior regions, given the number of clusters of exterior regions while decreasing, given the number of connections, when the total number of clusters of exterior regions becomes greater as in fig. 8-11, (a) and (c). The structure graphs show these relations clearly.

We can further demonstrate the implications of this measure through examples of typical combinations between clusters of

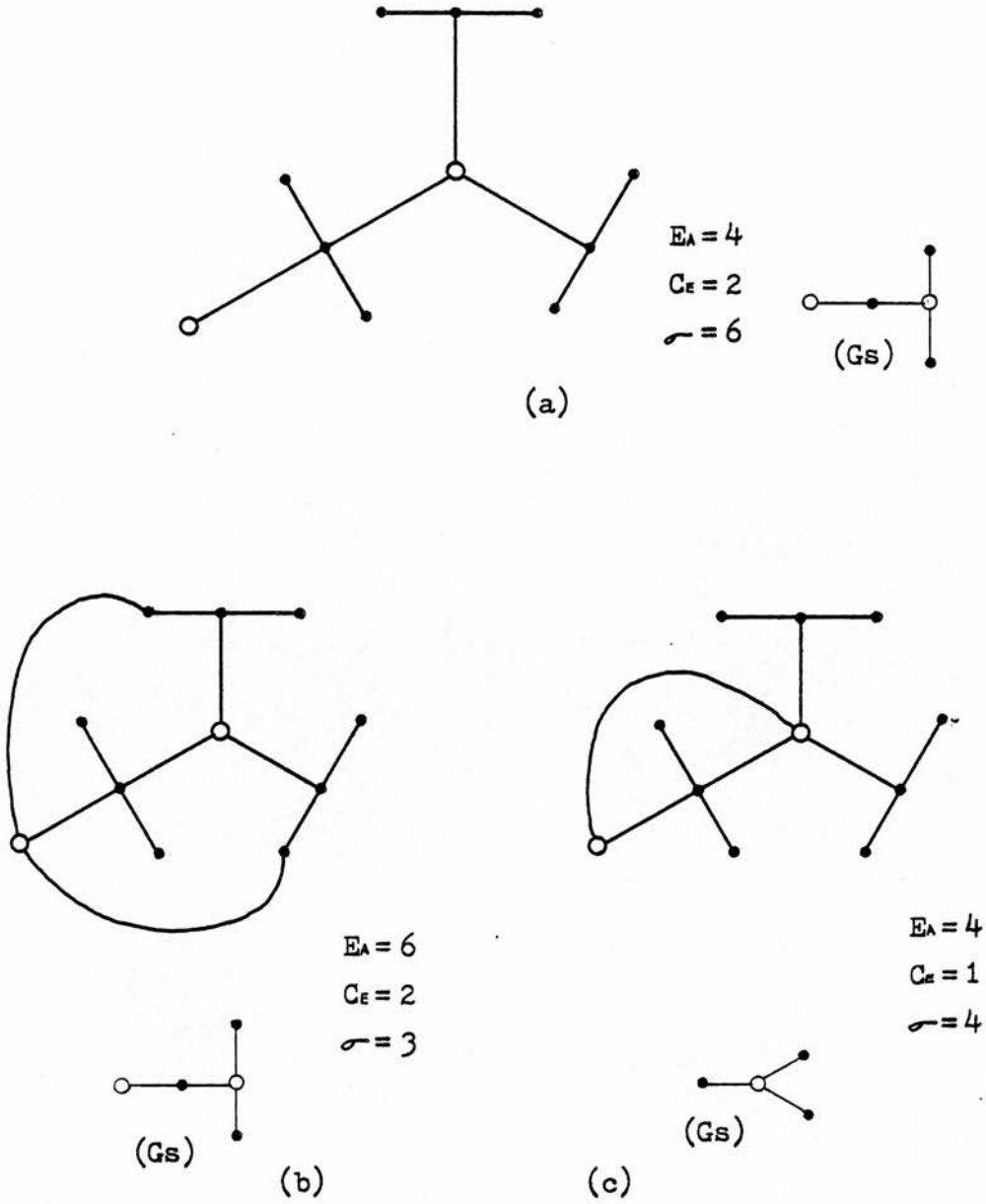
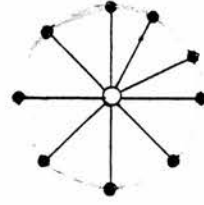
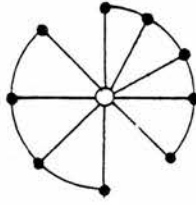
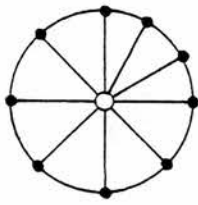


Fig. 8-11. The degree of integration between interior and exterior regions( $\sigma$ ).

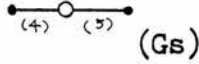
interior and exterior regions. For the convenience of explanation, let us choose some variations of connections of space organisations which consist of nine interior individual regions and one exterior individual region. As shown in fig. 8-12, let us illustrate these variations of relations by graphs whereby the interior individual region is represented by a closed dot and the exterior individual region is represented by an open dot. As shown in (a), (b), and (c) of fig. 8-12, if the number of edges between the exterior and interior clusters is fixed, the degree of integration is constant regardless of changes in the connections between interior regions. On the other hand, if changes in the connection of interior regions bring about changes in the number of connections between interior and exterior clusters as shown in (d), (e), and (f) of fig. 8-12, then this results in an increase or decrease in the values of the degree of integration. This measure shows how strongly the clusters of exterior regions reintegrate the segregated clusters of interior regions into a whole.

To define more clearly the implications of this measure for the socio-spatial dialectic, we need to examine its limitations. The more the values of  $\sigma$  will vary when the greater number of individual regions a space organisation has or the greater number of clusters of interior and exterior regions it has. This is because, here, the space organisation has the greater possible number of connections between the clusters of exterior and interior regions. To offset the effects of these factors on the values of  $\sigma$ , it would introduce problems of combinatorics and graph theory which are too complex to be handled within the scope of this study. Also, even if these factors were to be contained within a formula, there would remain uncertain<sup>ty</sup> as to whether this complex measure could yield meaningful interpretations for the socio-spatial dialectic. Consequently, we keep the measure of the degree of integration simple, though it has limitations in considering the effects of the number of individual regions and that of interior and exterior clusters.



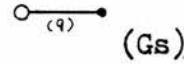
(a)

$E_A = 9$   
 $C_E = 1$   
 $\omega = 9$



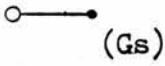
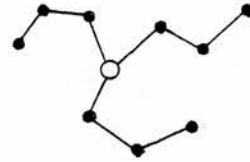
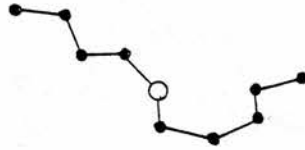
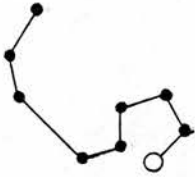
(b)

$E_A = 9$   
 $C_E = 1$   
 $\omega = 9$



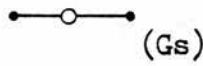
(c)

$E_A = 9$   
 $C_E = 1$   
 $\omega = 9$



(d)

$E_A = 1$   
 $C_E = 1$   
 $\omega = 1$



(e)

$E_A = 2$   
 $C_E = 1$   
 $\omega = 2$



(f)

$E_A = 3$   
 $C_E = 1$   
 $\omega = 3$

Fig. 8-12. Variations in the clustering and connection of interior regions.

As shown in fig. 8-10 and tables 8-3 and 8-4, the value of  $\sigma$  will generally increase with the increase in the values of  $\zeta$  as every segregated cluster of interior regions must have at least one connection with at least one of the clusters of exterior regions.

Table 8-4. The degree of integration( $\sigma$ ) of five house compounds.

house compounds	number of clusters of exterior regions ( $C_E$ )	number of connections between exterior and interior regions ( $E_A$ )	the degree of integration ( $\sigma$ )
Y1	2	22	11
Y43	1	7	7
SE12	3	12	4
SE4	2	16	8
SE63	1	8	8

Out of the five house compounds in the example, the exterior regions of SE12 obviously carry the least burden of energy-information transactions, especially in mediating between clusters of interior regions. Though the house compounds SE4 and SE63 have a lower degree of segregation than that of Y43, their degree of integration is higher and this implies that the exterior regions of the house compounds SE4 and SE63 take up a heavier role of mediation in energy-information exchange, not in terms of absolute quantity but in its intensity within the house compound, though these have fewer interior clusters in their charge than that of the house compound Y43.

### 8.3. THE MERIDIAN STRUCTURES

As repeatedly argued, the differentiation of space into individual regions and the integration of them into one whole constitute the organisation of life space through which people carry out energy-information transactions in their daily activities. In this respect, networks of individual regions may be analogically

compared to the meridian system of traditional Chinese medicine.<sup>(3)</sup> This system refers to the pathways of energy(Chhi) in the human body, which are regarded as active in the harmonious interaction between the complementary Chhi of yin and yang. As with this meridian system of the human body, the individual region graph may be regarded as representing the system of channels of energy-information flow, which is embedded within the organisation of people's life space. By analysing the structure of this system of pathways of energy-information, we might get a better understanding of the socio-spatial dialectic in that particular socio-spatial field of communication.

If individual region graphs are regarded as the representation of the meridian system of space organisations, the vertices representing individual regions can be regarded as nodal points of the pathways of energy-information which in turn are represented by edges. If we consider the dynamic situation of energy-information transactions from one nodal point to another, vertices are origins and destinations of energy-information transfer. To bring this dynamic notion of energy-information transactions into a general conceptual framework, we introduce the idea of a morphism.<sup>(4)</sup> In analysing networks of individual regions, a morphism is regarded as the mapping of energy-information between individual regions. In set theory, the mapping relation is represented by functions which assign an element in one set to each element of another set. But, in category theory, the mapping relation is represented by arrows which refer to a function as a unitary whole rather than on an element-by-element basis. Whereas a function is a single-valued mapping, a morphism is the mapping between objects which are not necessarily sets. The novelty of the idea of a morphism in its application to the analysis of the socio-spatial field of communication is that we can do away with contents and forms of energy-information(objects of sets) and deal only with relations of transactions(relations of arrows, mappings). Networks of individual regions can be regarded as diagrams of morphisms which

represent the transaction of energy-information from one individual region to another.

### 8.3.1. The Rigidity/Flexibility Index

For the analysis of individual region graphs seen as the meridian systems of space organisations, we may contrast two types of networks : those of tree and polygon. In a tree network, all the vertices belong to those of either valency 1 (end vertex) or of the cut vertex the removal of which separates the graph into two or more components. The polygon network generally refers to a graph each vertex of which has a valency of 2. If any individual region graph strongly has the character of tree network, the space organisation represented by it may be regarded as rigid. This is because, in the space organisation represented by a tree network, there is only one distinct route between any two individual regions and these can be separated by the obstruction of only a single individual region, which leaves no alternative route for the connection of these two regions. On the other hand, there always are two alternative routes between any two individual regions in the space organisation represented by a polygon network. In this space organisation, the disconnection of any two individual regions by the obstruction of one or more regions inbetween can be substituted by another alternative route. Consequently, the space organisation represented by a polygon network may be regarded as flexible.

It would be rather rare to find a space organisation which has purely either a tree network structure or a polygon one. More often space organisations have combinations of both properties to a degree. We may extract both properties separately from an individual region graph and compare them to give an index showing the rigidity/flexibility ratio of the space organisation represented by that graph. For this, we can draw the tree structure graph and polygon structure graph from the original individual region graph as shown in fig. 8-13. The tree structure graph is drawn by connecting only all the end vertices of valency 1 and all the cut



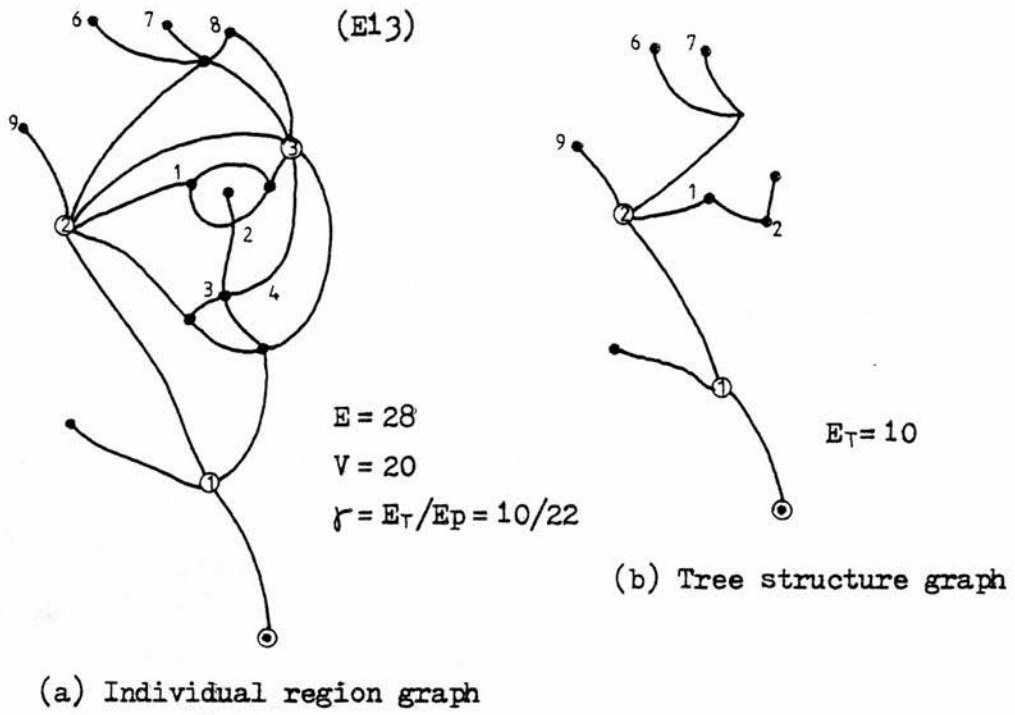


Fig. 8-13. The tree structure graph and polygon structure graph.

vertices present in an individual region graph as shown in fig. 8-13, (b). When there is more than one route between any cut vertices, the shortest one with the least number of edges in-between is chosen. The tree structure graphs of all surveyed house compounds are given in Appendix V. To construct the polygon structure graph from an individual region graph, remove all the end vertices of valency 1 and edges incident to them. If there are cut vertices which belong to separate collections of polygons and are connected by a bridge as the cases of vertices ① & ② of fig. 8-13, (a) contract these cut vertices into a single vertex. The polygon structure graph of E13 thus constructed is shown in fig. 8-13, (c). The polygon structure graphs thus constructed for the surveyed house compounds of the four villages are given in Appendix VI. Here, the polygon structure graph not only refers to the graph every vertex of which has the valency of 2 but also to the network which consists of more than one polygon face. Therefore, the minimum valency of a vertex is 2 in the polygon structure graph. The rigidity/flexibility index of a space organisation is given by the ratio between the number of edges of the tree structure graph  $E_T$  and that of the polygon structure graph  $E_P$  :  $r = E_T/E_P$ . The higher the value of  $r$  a space organisation possesses, the more rigid it is in the energy-information transactions and vice versa.

As we already stated, the division into tree and polygon networks of a space organisation is artificial. In the tree structure graph ( $G_T$ ), the individual regions disconnected by removing one or more regions are not necessarily disconnected in the real space organisation. In the case of Y43 as shown in fig. 8-14, (a), the relation of disconnection in the tree structure graph corresponds with the connectivity in the real space organisation. In the house compound Y43, the spaces disconnected by removing an individual region in  $G_T$  also have no alternative route connecting them in the real space organisation. But, in the case of SE4, for example, though the spaces 2 and 8 are disconnected by removing the space 1 in  $G_T$ , the two spaces actually have alternative routes in the real space organisation as shown in (d) of fig. 8-14. This implies

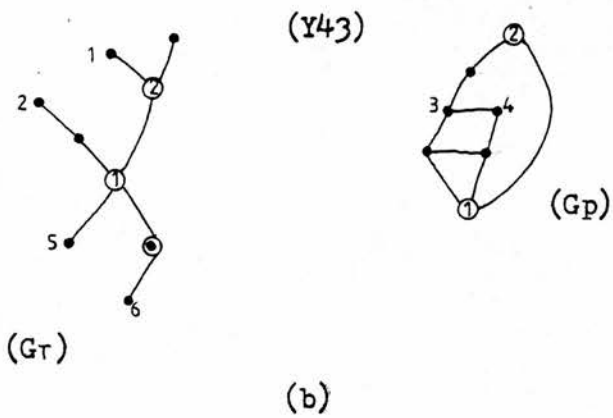
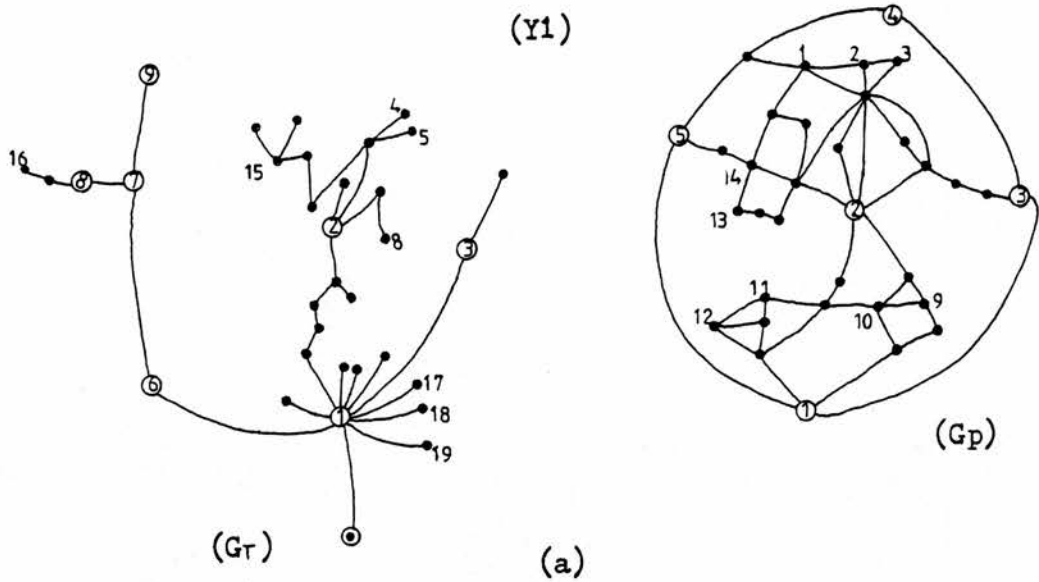


Fig. 8-14. Tree structure graphs( $G_T$ ) and polygon structure graphs( $G_P$ ) of five house compounds.

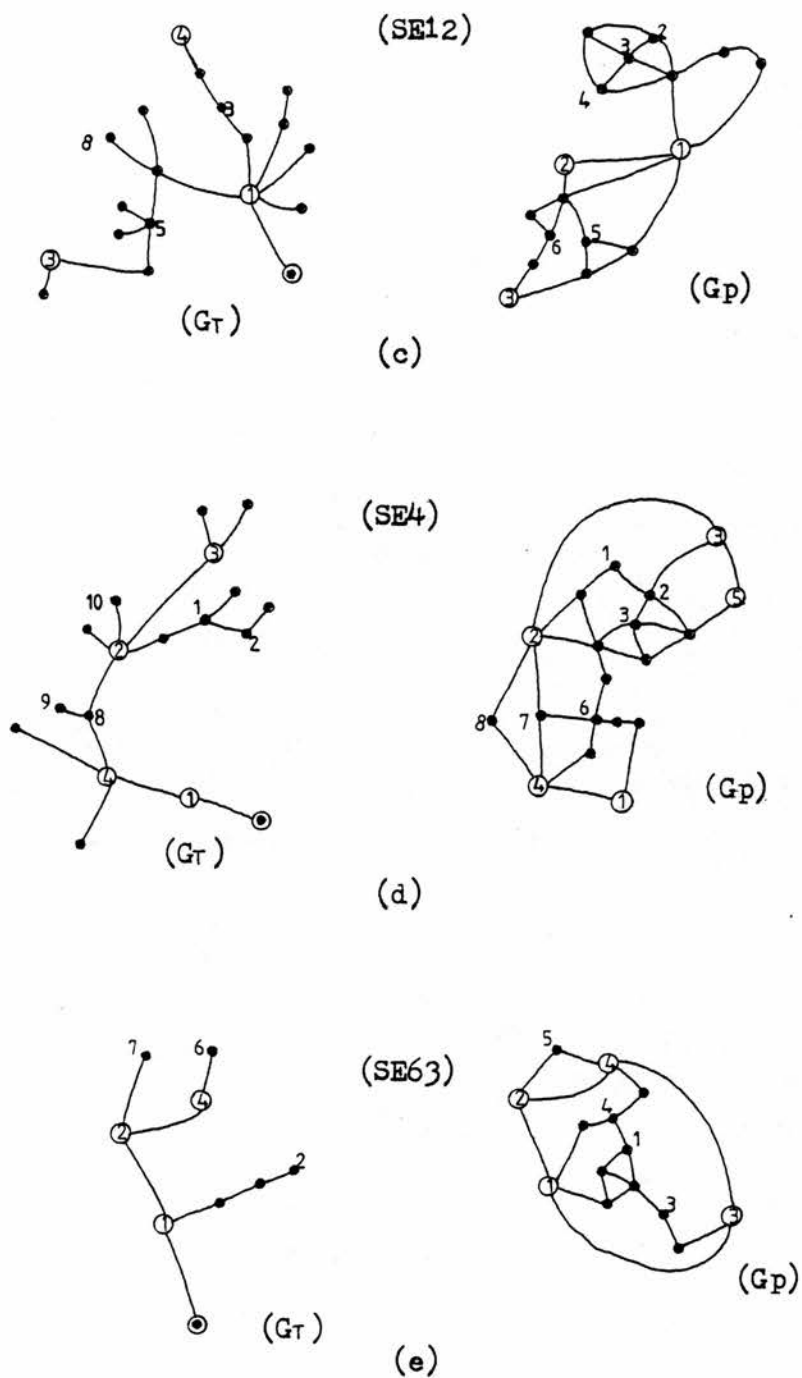


Fig. 8-14. Tree structure graphs( $G_T$ ) and polygon structure graphs( $G_P$ ) of five house compounds.

that Y43 consists of a more or less rigid spatial structure compared with SE4 and a tree structure graph represents only the shortest routes connecting dead-end spaces and individual regions corresponding to the cut vertices of individual region graph. In this respect, the r/f index equals the ratio between the connections of individual regions providing these routes and those pertaining to the circulatory routes of the space organisation, which correspond to the edges of the polygon structure graph. Accordingly, this index measures how people employ the spatial medium to accommodate these opposite but complementary properties of energy-information transactions in the socio-spatial field of communication : the circulation of persons and things on the one hand and placing them in proper fixed locations on the other.

If we take examples of five house compounds as shown in figs. 8-10 and 8-14 and table 8-5, the house compound Y43 has the highest value of 0.89 for  $r$  and SE63 the lowest with 0.40. This implies that out of the five house compounds, Y43 has the most rigid spatial organisation and SE63 the most flexible one in terms of connections between individual regions while the others lie in between.

Table 8-5. The rigidity/flexibility index( $r$ ) of five house compounds.

house compounds	number of edges of tree structure graph( $E_T$ )	number of edges of polygon structure graph( $E_p$ )	the rigidity/flexibility index( $r$ )
Y1	33	54	0.61
Y43	8	9	0.89
SE12	18	26	0.69
SE4	17	30	0.57
SE63	8	20	0.40

This understanding leads to the interpretation that, for the house compound SE63, the greater proportion of connections between individual regions is engaged in the circulation of energy-information resources and the lower proportion of them

contribute to placing energy-information resources in fixed dead-end spaces whereas, for the house compound Y43, the opposite is the case. The understanding of these properties in relation to the two poles of the socio-spatial field of communication is yet to be seen after investigating their collective nature in the villages as a whole in section 8.4..

### 8.3.2. The Organicity Index

If an individual region graph is considered as a diagram of morphisms, its edges consist of a series of arrows. When there are alternative pathways from one region to another in the network of individual regions, the overall result would be the same whichever route we follow. Different compositions of arrows, which make distinctive pathways with the same origin and destination, are exchangeable. In this case, the composition of morphisms(arrows) yields a commutative diagram. The relevant basic mathematical notions on morphism and commutative diagram are presented in Appendix M. The more distinctive pathways any two individual regions have in a space organisation, the more flexible the space organisation would be in the energy-information transactions. Even though polygon networks are more flexible than tree networks in this aspect, polygon networks are still weak in the commutative relations of morphisms. For networks with a stronger flexibility than polygon networks, we can think of those in which there are at least three alternative routes between any two vertices. In these networks, if we consider three vertices A, B, and C instead of two, there will be at least two alternative paths from B to C whenever there is a path from A to B. Vertices and edges of an individual region graph pertaining to these properties cannot be found merely by detecting vertices with the valency of three or more and their incident edges. These vertices and their connections can only be found by applying a reduction process to the original individual region graph. The graph constructed from the original individual region graph through this reduction process may be called the morphism structure graph.

The morphism structure graph of a network does not necessarily consist of only one connected component. If there appears a bridge in the morphism structure graph, which is an edge of a connected graph whose removal disconnects the graph, those commutative relations of morphisms do not apply to the vertices incident on each side of the bridge. So, in this case, the morphism structure graph becomes a set of disconnected components by the removal of bridges. Therefore the commutative relations of morphisms only apply to the vertices within a connected component of a morphism structure graph(fig. 8-15). We can construct the morphism structure graph by a series of repetitive reductions from an original network without damaging the structural properties of the network in terms of energy-information transactions between individual regions of space :

Step 1 : Remove all the vertices of valency one.


Step 2 : Elimination of all the vertices of valency two by merging edges in series which have one vertex in common.

Step 3 : If parallel edges come about in the above reduction processes, remove all but one edge between every pair of vertices.

Step 4 : Remove the self-loop if it is produced during the above reduction processes.

Repeat the above reduction process until the network reaches the morphism structure graph in which the reduction process cannot be applied any more.

Step 5 : Finally remove all the bridges wherever these appear at the end of the above process of reductions.

The minimal morphism structure graph is a clique of four vertices, of which each two distinct vertices are joined by one edge without loops :  . The network which contains no elements for the commutative relation of morphisms is reduced to a vertex-graph with just one vertex and no edge. We present a real example of this reduction of an individual region graph(SE12) to a morphism structure graph in fig. 8-16. All the morphism structure graphs of house compounds of the surveyed villages are given in Appendix VII.

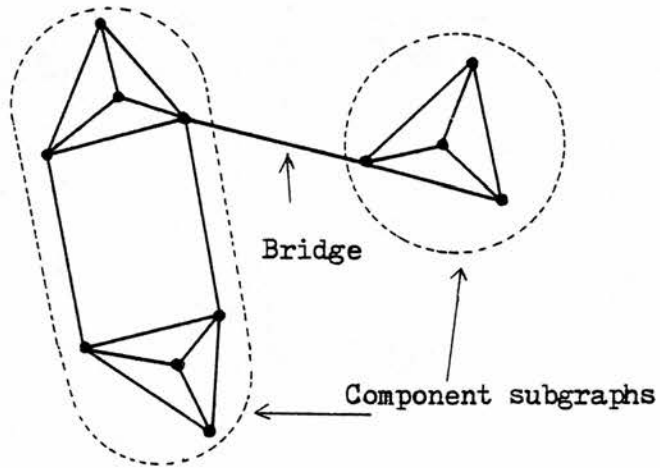
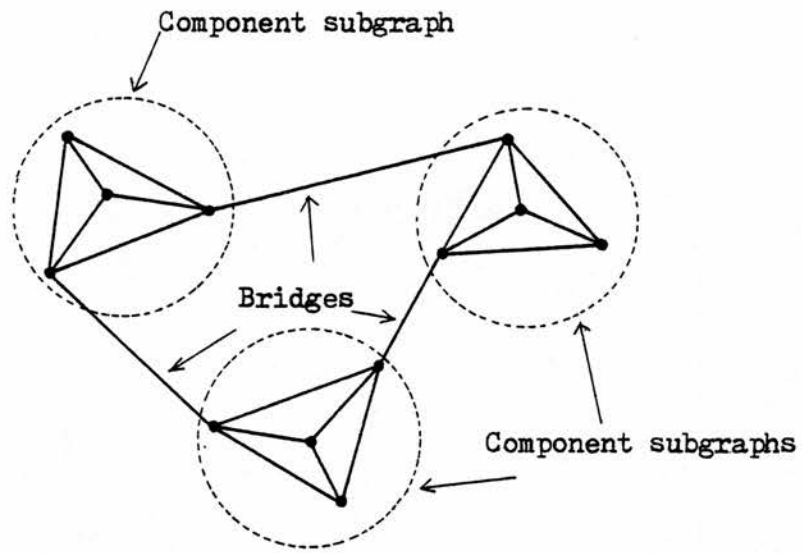


Fig. 8-15. Component subgraphs and bridges.



(SE12)

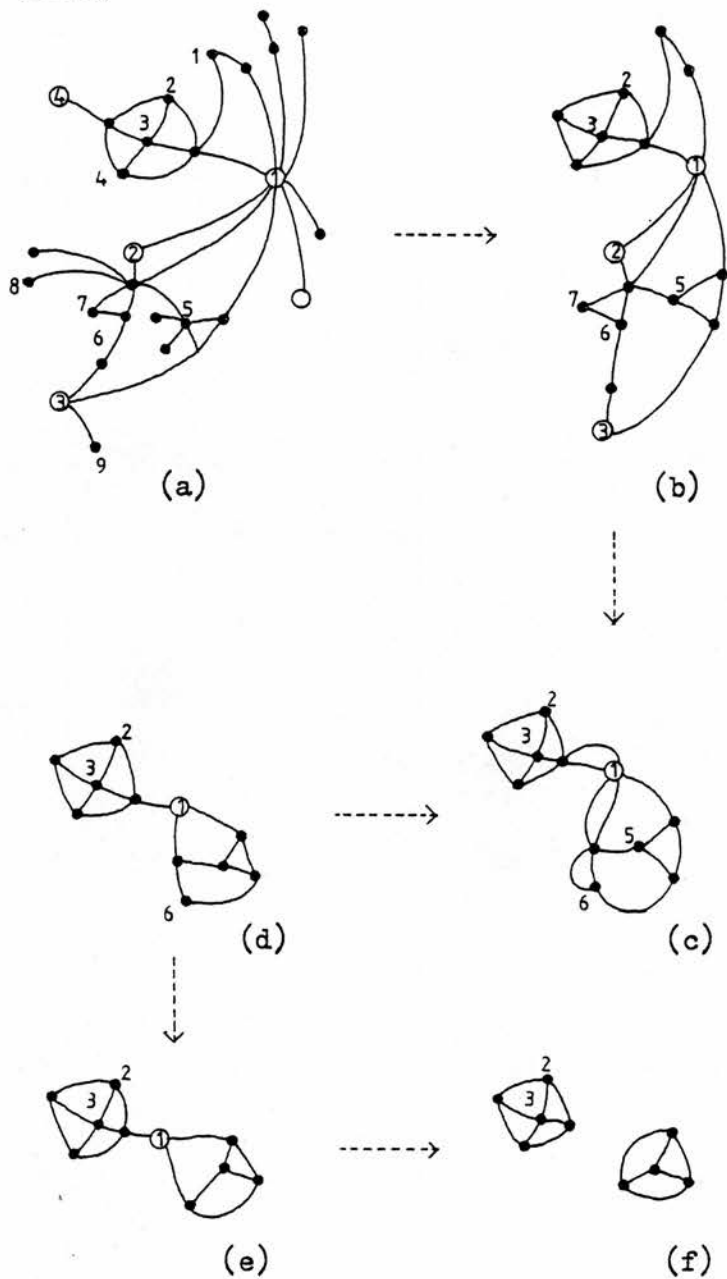


Fig. 8-16. The process of the reduction of network to morphism structure graph.

The individual regions of a space organisation corresponding to the vertices of its morphism structure graph are taken to be the kernel points without which people's activities as energy-information transactions are greatly jeopardised. These must be the spaces through which the most frequent transfers of energy-information are carried out in people's daily activities. The more the number of vertices of the morphism structure graph, the more alternative routes between individual regions there will be in that space organisation. If there are more options for the choice of routes between individual regions, the obstruction of pathways of energy-information transactions can more easily be overcome by taking another route. Accordingly, the adaptability of this space organisation to a possible change of requirements would be greater. In this respect, this space may be regarded as more organic. If the morphism structure graph of a space organisation shrinks to a single vertex, this space organisation may be regarded as not organic. The ratio of the number of vertices of the morphism structure graph to that of the original individual region graph divided by the number of components of the morphism structure graph will measure the organicity of the space organisation. The organicity index of a space organisation is represented by the formula  $\lambda = V_M / V \cdot \sqrt{H_M}$  whereby  $V_M$ ,  $H_M$ , and  $V$  each refers to the number of vertices of the morphism structure graph, the number of its component, and the number of vertices of the original individual region graph.

If the morphism structure graph of a space organisation consists of multiple components, the number of routes between individual regions corresponding to the separate components is minimal, as shown in fig. 8-16. Let us take some schematic examples of morphism structure graphs of a space organisation which has 16 individual regions, as shown in fig. 8-17. The value of the organicity index increases with the increase in the number of individual regions represented by the morphism structure graph. If the morphism structure graph consists of more than one component, the organicity index of the space organisation decreases, when  $V_M$

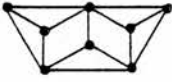
$$V = 16$$

$$\lambda = V_M / V \cdot \sqrt{H_M}$$



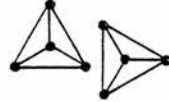
$$\lambda = 4/16 \cdot \sqrt{1} = 1/4$$

(a)



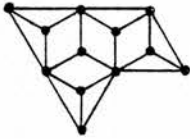
$$\lambda = 8/16 \cdot \sqrt{1} = 1/2$$

(b)



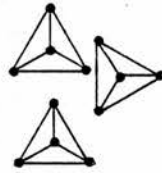
$$\lambda = 8/16 \cdot \sqrt{2} = 0.35$$

(c)



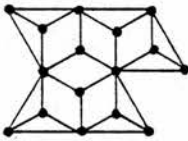
$$\lambda = 12/16 \cdot \sqrt{1} = 3/4$$

(d)



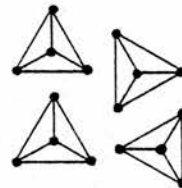
$$\lambda = 12/16 \cdot \sqrt{3} = 0.43$$

(e)



$$\lambda = 16/16 \cdot \sqrt{1} = 1$$

(f)



$$\lambda = 16/16 \cdot \sqrt{4} = 1/2$$

(g)

Fig. 8-17. Variations of morphism structure graphs of a space organisation with 16 individual regions.

is fixed, as the reciprocal of the square root of the number of components. As shown in (b) and (c) of fig. 8-17, though both cases have the same number of individual regions with 8 of them, the space organisation represented by the morphism structure graph (c) has a lower value of the organicity index than that of the case (b) while higher than that of (a) with  $V_M = 4$  because its individual regions of the morphism structure graph are grouped into two separate clusters. As shown in Appendix VII, except for several cases which have two components, most of the surveyed house compounds in the four villages in fact possess only a single component in their morphism structure graphs. This implies that most house compounds here have a single core of the energy-information transactions rather than double or multiple cores.

The set of vertices of the morphism structure graph of a space organisation is included in the set of vertices of its polygon structure graph :  $V_M \subseteq V_P$ . Therefore the sets of vertices commonly present in all the three meridian structure graphs are the same with the set of vertices included in both the tree structure graph and morphism structure graph :  $V_T \cap V_M \cap V_P = V_T \cap V_M$ . The individual regions which correspond to these vertices commonly included in all three meridian structure graphs are considered to be the chief kernel regions of the house compound the role of which cannot be substituted by any other region.

Generally, the values of the organicity index ( $\lambda$ ) are expected to be low when the values of the r/f index ( $\rho$ ) are high and vice versa, as the measure of organicity index is basically an extension of the measure of r/f index to the extent that the flexibility of a space organisation is stabilised at a certain level. As shown in tables 8-5 and 8-6, the values of  $\rho$  and  $\lambda$ , though they follow our expectation to a large extent, do not correspond linearly in their relations as in the case of Y43 & SE12 because the measure of  $\lambda$  takes account of individual regions while that of  $\rho$  takes account of the connections between individual regions. As shown in table 8-6, SE63 has the highest proportion of its individual regions as

nodal points of its organic network which consists maximum alternative routes between individual regions over its polygon

Table 8-6. The organicity index( $\lambda$ ) of five house compounds.

house compounds	number of individual region(V)	number of individual regions corresponding to the vertices of MSG( $V_M$ )	number of components of MSG( $H_M$ )	organicity index( $\lambda$ )
Y1	58	20	1	0.34
Y43	13	4	1	0.31
SE12	28	9	2	0.23
SE4	30	11	1	0.37
SE63	18	8	1	0.44

network. Though Y43 has actually the least proportion of individual regions for this, SE12 is regarded to have the least in effect, taking these being grouped into the two separate clusters into account as shown in (c) of fig. 8-18.

The individual regions corresponding to the vertices of morphism structure graphs shown in fig. 8-18 are supposed to be the kernel spaces of each house compound, which accommodate a substantial proportion of people's activities as energy-information transactions. By investigating these kernel spaces with the help of the plan of each house compound shown in fig. 8-10 and of its individual region map from Appendix II, we get a better understanding of the house compound as a level of the socio-spatial field of communication in a village community.

With the exception of SE4, the kitchen occupies a nodal point of the organic network for every house compound. The entrance courtyard(Apmadang) is also included in it except for the case of SE12. The kitchen and outdoor yard, especially the entrance courtyard can be regarded as taking an important role for the energy-information transactions in a house compound. In the case of Y43 which has the highest value of the r/f index, the only spaces

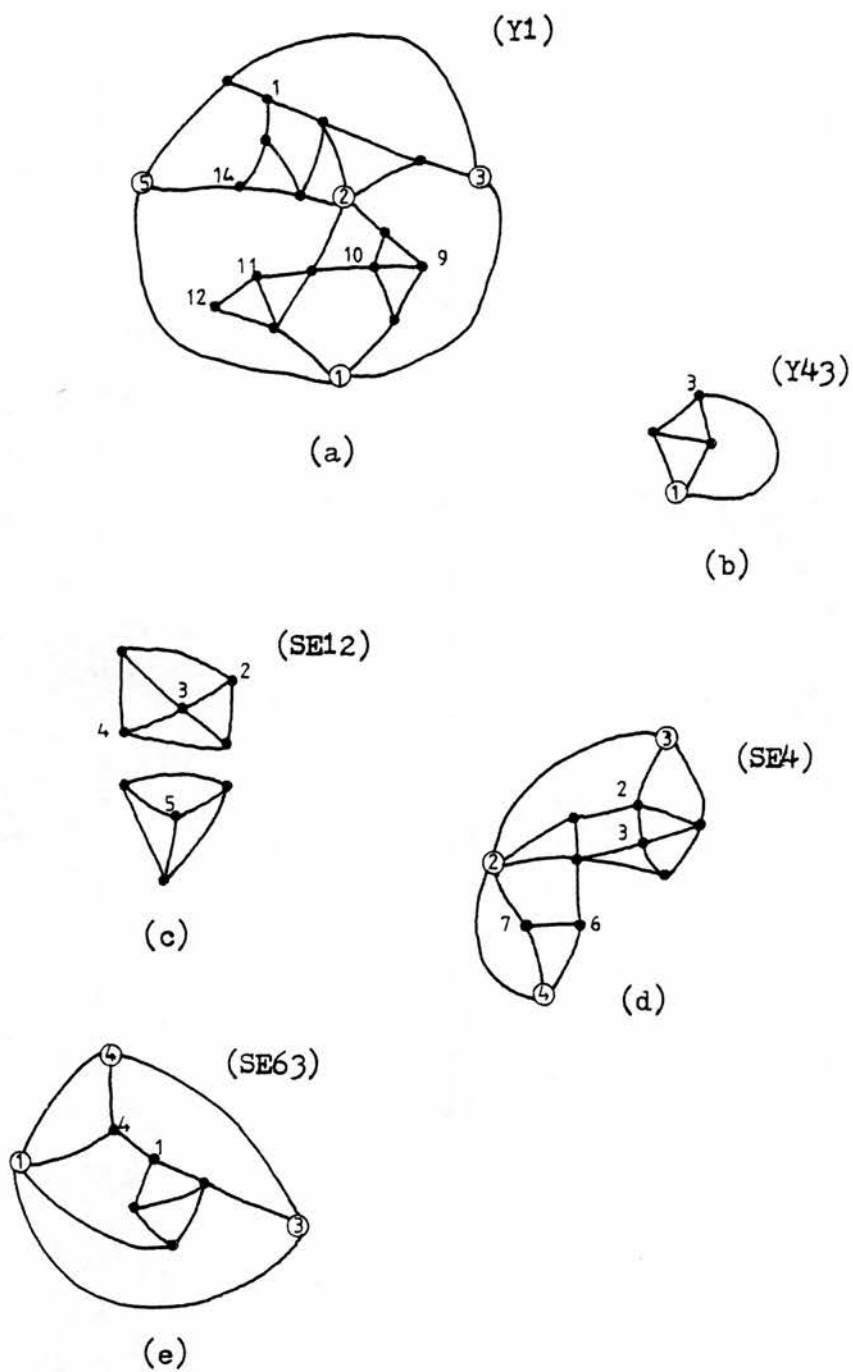


Fig. 8-18. The morphism structure graphs of five house compounds.

appeared in the morphism structure graph, except the base spaces, are, in fact, the kitchen and the entrance yard. No doubt, base spaces are included in the organic network of every house compound and, in the case of Y1 and SE4 where major buildings or spaces are located around a courtyard, this courtyard is one of the kernel spaces. Out of the five house compounds in the example, only SE12 does not have any outdoor yards as the nodal points of its organic network. As we investigated in section 8.2., this house compound has the lowest values in both the degree of segregation and of integration. In this house compound, outdoor yards take a moderate role in mediating between individual regions and remain more or less independent from other regions. As also shown in (c) of fig. 8-18 and (c) of fig. 8-10, the kernel regions of this house compound are divided into two separate clusters because the entrance yard keeps a low key in mediating between the kernel regions included in the two separate clusters. Insofar as this moderate role of outdoor yards in the energy-information transactions is interpreted as the key contribution to the lowest value of the organicity index in the house compound SE12, surely the outdoor yard is one of the most important spaces in the house compound of the villages at least for it to be organic in the socio-spatial communication. Commonly, except for Y43, the main room of the women's section (Anbang) and that of the men's section (Sarangbang), and when present, the ma-ru spaces attached to them (Anbang-maru or Andaichung and Sarang-maru or Sarangdaichung respectively) are the kernel spaces for the energy-information transactions in each house compound.

As shown in Appendix VII and Appendix T-3, a substantial number of house compounds in each village have a single vertex as their morphism structure graph, varying about one tenth to half of its total, and these pertain to a rigid (inorganic) space organisation. The values of the organicity index for these house compounds decrease as their number of individual regions increases so that the more differentiated and the bigger in dimension the house compound is the lower its organicity index is insofar as it does not have an

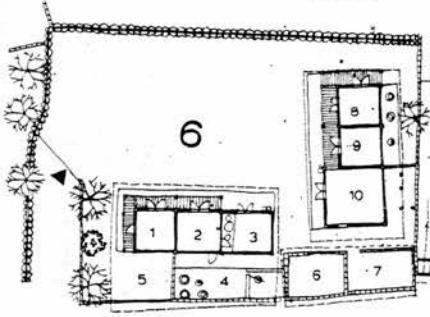
organic network. Although the maximum value of the organicity index, in the case of house compounds without the organic network, is 0.25 as the minimum number of individual regions of the organic network is four, the values of the organicity index for the house compounds with the organic network do not always exceed 0.25. As shown in figs. 8-19 and 8-20, both house compounds S06 and SE20 have the values of the organicity index of under 0.25 but S06 has the single vertex as its morphism structure graph while SE20 has an organic network. We may characterise the space organisations of these two house compounds distinguishedly : S06 may be regarded as inorganic whereas SE20 can be characterised as not organic for it does not possess enough kernel regions relative to its number of differentiated individual regions to be really organic.

#### 8.4. COLLECTIVE PROPERTIES OF THE STRUCTURAL PARAMETERS

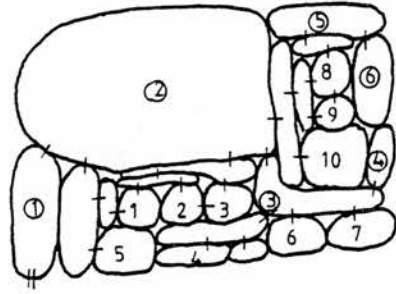
So far, in this chapter, we have dealt with measures which indicate the basic properties of the socio-spatial field of communication and discussed the meaning of these measures in relation to the socio-spatial dialectic in the real life space. The formulation of these measures followed the process of model building (as it was discussed in chapter 2) in which certain topological relations holding for the parametric measures of a house compound are assumed to apply in the same way to others of its kind in the village communities. The measured values for these structural parameters do not contain any indices directly pointing to a village as a whole but reflect the properties of individual events. Though a house compound in itself constitutes an independent socio-spatial field, it is also a part of a village community at another level of the socio-spatial field of communication. The house compounds as partial fields are interrelated with each other and these interrelations constitute a reality of socio-spatial communication in the village as a whole. Of course, a village community as a whole socio-spatial field consists of many other species of spatial organisations as its partial fields. ~~such as~~ such as, *for instance,* roads, farming fields, unused spaces, and some public buildings.



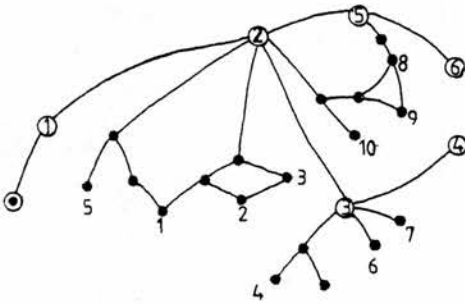
(S06)



(a) Plan



(b) Individual region map



(c) Gr

●  $V_M = 1$

(d)  $G_M$

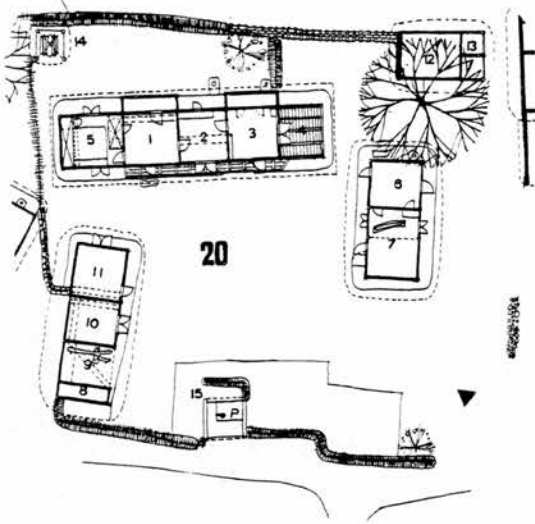
$$\lambda = V_M / V \cdot \sqrt{H_M} = 1 / 22 \cdot \sqrt{1} = 0.04$$

$G_R$  : Individual region graph

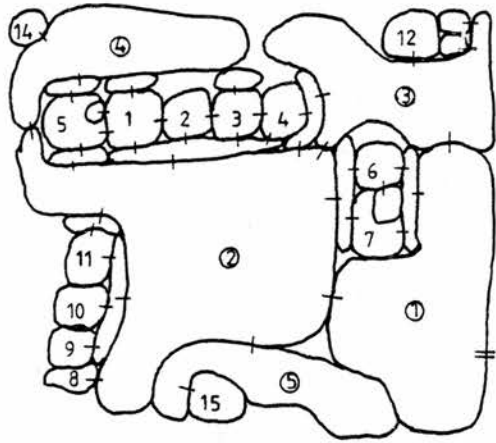
$G_M$  : Morphism structure graph

Fig. 8-19. A house compound whose morphism structure graph is a single vertex.

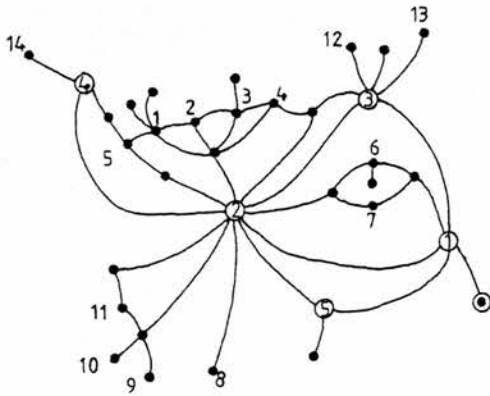
(SE20)



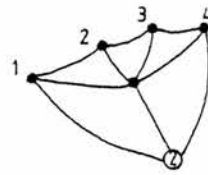
(a) Plan



(b) Individual region map



(c) Gr



(d) G<sub>m</sub>

$$V = 34, V_M = 6$$

$$\chi = V_M / V \cdot \sqrt{H_M} = 34 / 6 \cdot 1 = 0.18$$

Fig. 8-20. An example of house compound with an organic network and its value of the organicity index under 0.25.

But, in this investigation, the socio-spatial field is confined to the collection of house compounds in the surveyed villages as these comprise mainly the homogeneous feature of spatial organisation in these communities. Though continuously changing and consisting of interactions of individual incidents, these interrelations as a unified entity may in turn impose certain constraints on the partial fields to maintain structural stability as a whole. In this respect, house compounds as parts and the village community as a whole constitute each other.

What implications do individual values of the structural parameters collectively suggest for the socio-spatial dialectic of a community as it is considered as a whole field consisting partial fields of house compounds, especially concerning the two interacting poles of the socio-spatial field of communication? The interrelations of partial fields in reality may be captured through an understanding of the collective properties of these individual values. And this can be achieved by a statistical description of these individual values<sup>(5)</sup> insofar as a village community is assumed to be a whole socio-spatial field consisting partial fields represented by these values.

In carrying out this task we first look into the spreads of values of the structural parameters for each village with illustrations through box-and-whisker diagrams and then compare the spreads for pairs of related parameters in each village and for the same parameter between different villages. Secondly, we investigate correlations between related pairs of parameters for each village, especially referring to the slope of regression.<sup>(6)</sup> The slopes of the same pairs of parameters for different villages are compared. This investigation is centred on the general trend of relations but not on the cause-effect or dependent relations between the parameters. The number of cases for the values of each parameter, except occasionally for a few missing ones, includes all the house compounds for Euin and Seommaeul which amount to 40 and 64 respectively. For Yangdong village, the cases were

selected both by cluster sampling<sup>(7)</sup> through which a region of the village consisting of 35 house compounds was chosen, and by intentional sampling through which 10 house compounds of varied types were chosen from the remaining regions, amounting to a total of about 30% of the 148 house compounds of the village. For Sopyung, 19 cases making up the inner part of the village were chosen, comprising about 39% of the 49 house compounds.

For the collective properties of values of structural parameters to lead to an interpretation of the socio-spatial dialectic taking place in the villages, we need to presume the basic nature of the two interacting poles of socio-spatial field of communication, specifically relating to each structural parameter. Though Sopyung consists wholly of households of the Sang-Min class, the other three villages are composed of households from both classes and here house compounds are not always strictly classifiable into those of folk culture or of high culture. The attributes of the two poles of the socio-spatial field of communication may be assumed by inferring from the two contrasting artificial collections of house compounds which are chosen from the four villages. One of the two collections consists of 17 typical Yang-Ban house compounds and we shall call it the H collection (high culture) whereas the other one consists of the same number of typical Sang-Min house compounds which we shall call the F collection (folk culture). The selection is limited to 17 house compounds for each because there happen to be only 17 typical Yang-Ban house compounds. The house compounds thus selected are listed in table 8-7. Though the

Table 8-7. The H and F collections of house compounds.

H collection				F collection			
E10	E11	E12	E22	E4	E17	E36	SE21
E30	E35	E41	E42	SE35	SE41	SE47	SE52
SE3	SE6	SE23	SE69	SE63	Y6	Y30	Y43
Y1	Y3	Y4	Y5	Y45	S05	S010	S015
Y15				S019			

individual values of the structural parameters of these two collections are drawn from the real house compounds of the four villages, for these as a whole to represent a unified body of the socio-spatial field of communication is artificial. Therefore, the H and F collections which are presumed to retain the idealised properties of the complementary poles of the socio-spatial field of communication are adopted as a conceptual tool on the basis of which the collective properties of structural parameters of the real villages can be interpreted.

The values of the parametric properties for each house compound of the four villages, which are calculated according to the formulae set out in this chapter, are given in Appendix T. A summary of the statistics of these values and the computation of correlation coefficients, of the slopes of regression lines, and of related statistics for pairs of related parameters were executed using the SPSS-X(Statistical Package for Social Science) program through EMAS(Edinburgh Multi-Access System). The results are shown in tables 8-8 and 8-10.

#### 8.4.1. Spreads of the Structural Parameters

Let us start by looking into the spreads of values of structural parameters for each village as shown in table 8-8 and fig. 8-21, especially concentrating on the interaction of two poles of the socio-spatial field of communication. As already suggested, the spreads of values in the H and F collections, which are assumed to represent opposite poles, are used as the indicator for interpreting the interaction of the two poles in each village. In the intensity of differentiation as shown in fig. 8-21, (a), more than half of the cases of F are lower than the minimum value for H and three-quarters of house compounds in F have values less than the first quartile of F. This implies that the collection of house compounds of the folk culture ideology(or of the Sang-Min) existing in a village contribute mainly to the lower portion of the spread while those of the high culture ideology(or of the Yang-Ban) make up

Table 8-8. Summary statistics of the structural parameters.

	EUIN	SEOMMAEUL	YANGDONG	SOPYUNG	H COLLECTION	F COLLECTION
MEAN	5.210	3.740	3.489	4.909	8.241	3.323
STD DEV	3.292	2.305	2.101	1.722	3.771	1.609
MINIMUM	1.840	.940	.530	1.690	3.430	1.530
MAXIMUM	15.020	13.250	9.230	8.400	15.020	8.400
1ST QUARTILE	3.015	2.047	1.910	3.790	4.470	2.085
MEDIAN	4.210	3.235	2.890	4.690	8.110	3.100
3RD QUARTILE	6.175	4.670	4.710	5.960	10.665	3.965
MEAN	.479	.475	.484	.449	.485	.452
STD DEV	.034	.047	.050	.029	.024	.029
MINIMUM	.400	.390	.380	.400	.450	.390
MAXIMUM	.550	.670	.650	.510	.540	.500
1ST QUARTILE	.450	.440	.450	.420	.465	.440
MEDIAN	.485	.470	.480	.450	.490	.450
3RD QUARTILE	.500	.500	.510	.470	.500	.475

Table 8-8. Summary statistics of the structural parameters (contd.).

	EJIN	SEOMMAEUL	YANGDONG	SOPYUNG	H COLLECTION	F COLLECTION
MEAN	5.537	5.169	4.460	5.368	5.029	5.176
STD DEV	2.571	2.558	2.039	2.033	2.540	2.069
MINIMUM	1.700	1.000	1.000	2.000	1.700	2.000
MAXIMUM	14.000	12.000	9.000	10.000	10.000	9.000
1ST QUARTILE	3.125	3.000	3.000	4.000	2.400	3.500
MEDIAN	5.750	5.000	4.000	5.000	5.700	5.000
3RD QUARTILE	7.000	7.000	6.000	7.000	7.000	7.000
MEAN	10.820	8.714	8.144	8.395	12.206	8.500
STD DEV	4.752	4.131	4.005	2.993	6.108	3.775
MINIMUM	3.500	3.000	1.500	3.000	5.700	3.000
MAXIMUM	24.000	24.000	18.000	15.000	24.000	15.000
1ST QUARTILE	7.625	6.000	5.500	6.000	6.850	4.750
MEDIAN	10.000	8.000	8.000	8.000	11.000	9.000
3RD QUARTILE	12.000	10.750	11.000	11.000	16.500	11.500

Table 8-8. Summary statistics of the structural parameters (contd.).

	EJIN	SEOMMAEUL	YANGDONG	SOPYUNG	H COLLECTION	F COLLECTION
MEAN	.613	.661	.688	.819	.518	.892
STD DEV	.273	.338	.624	.420	.097	.689
MINIMUM	.210	.110	.060	.420	.390	.330
MAXIMUM	1.330	2.000	3.330	1.730	.740	3.330
1ST QUARTILE	.432	.460	.395	.530	.440	.500
MEDIAN	.580	.625	.500	.630	.490	.780
3RD QUARTILE	.717	.840	.740	.940	.595	.930
MEAN	.331	.252	.310	.166	.383	.189
STD DEV	.124	.169	.184	.114	.077	.126
MINIMUM	.030	.040	.070	.040	.260	.050
MAXIMUM	.530	.710	.850	.410	.530	.440
1ST QUARTILE	.252	.065	.130	.070	.320	.060
MEDIAN	.355	.240	.290	.170	.380	.180
3RD QUARTILE	.430	.380	.445	.240	.425	.275



Fig. 8-21, (a). Box-and-whisker plot of values of the intensity of differentiation( $\alpha$ ).

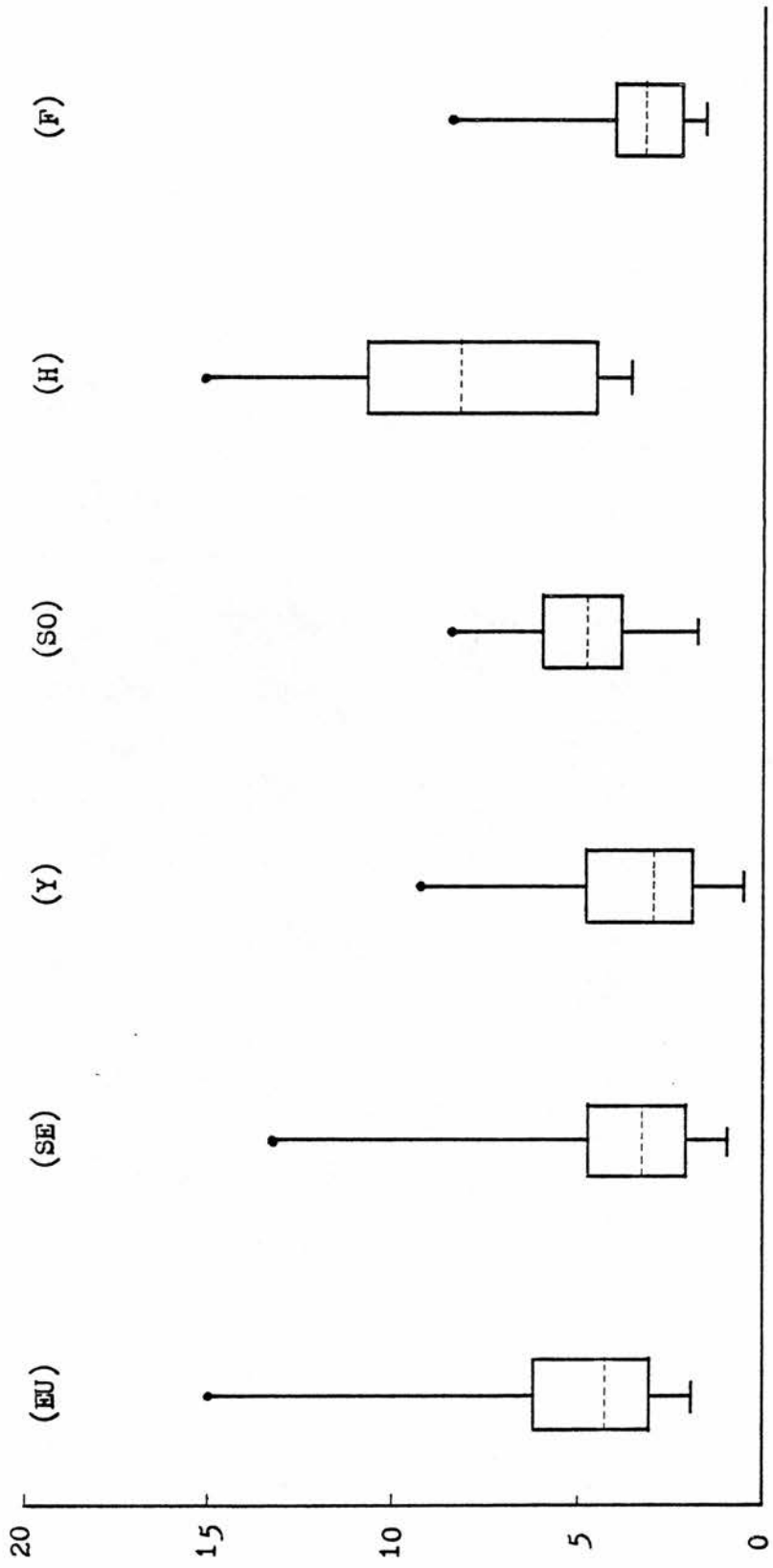


Fig. 8-21, (b). Box-and-whisker plot of values of the degree of connection( $\beta$ ).

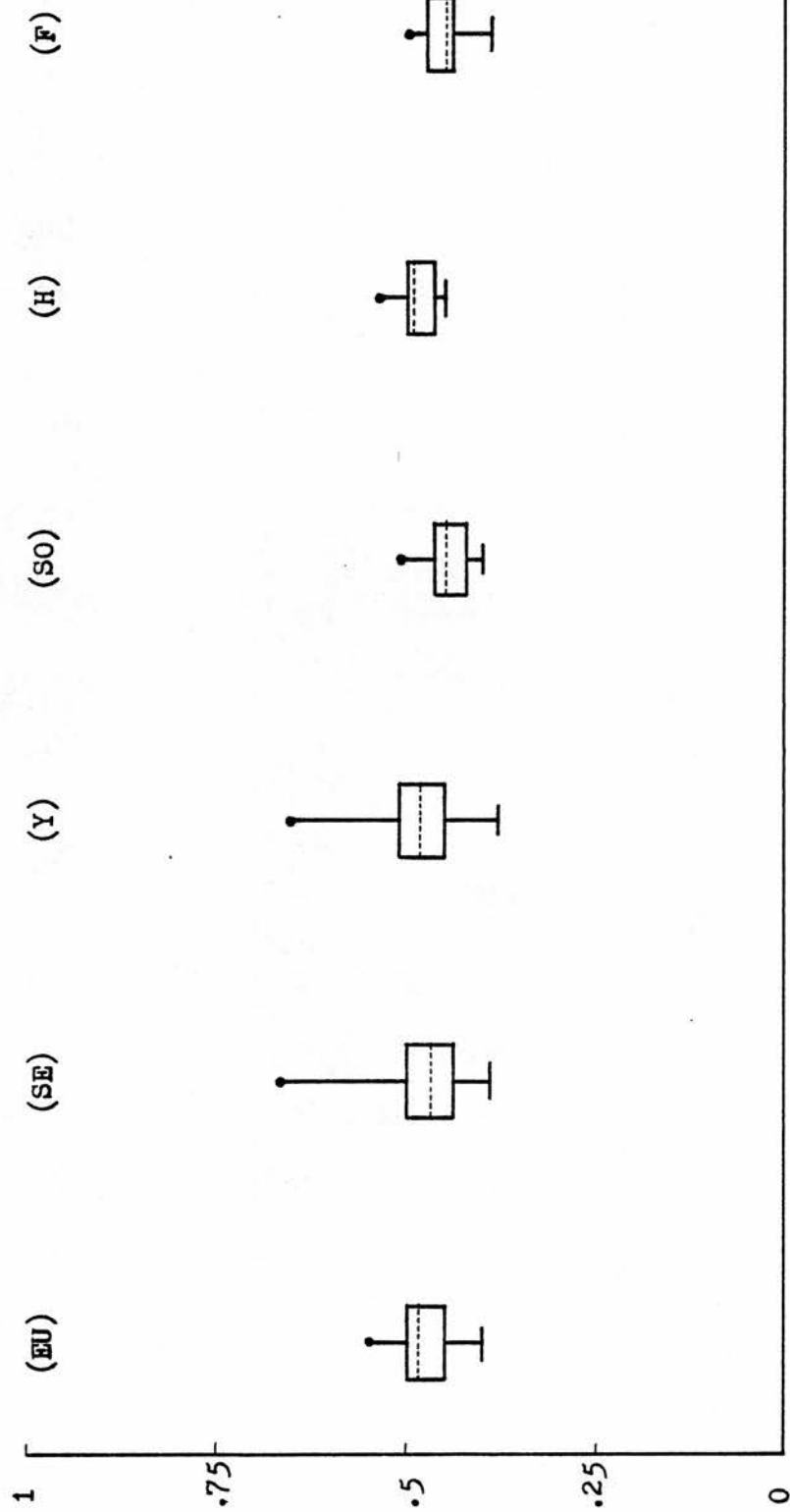


Fig. 8-21, (c). Box-and-whisker plot of values of the degree of segregation( $\delta$ ).

(EU) (SE) (Y) (SO) (H) (F)

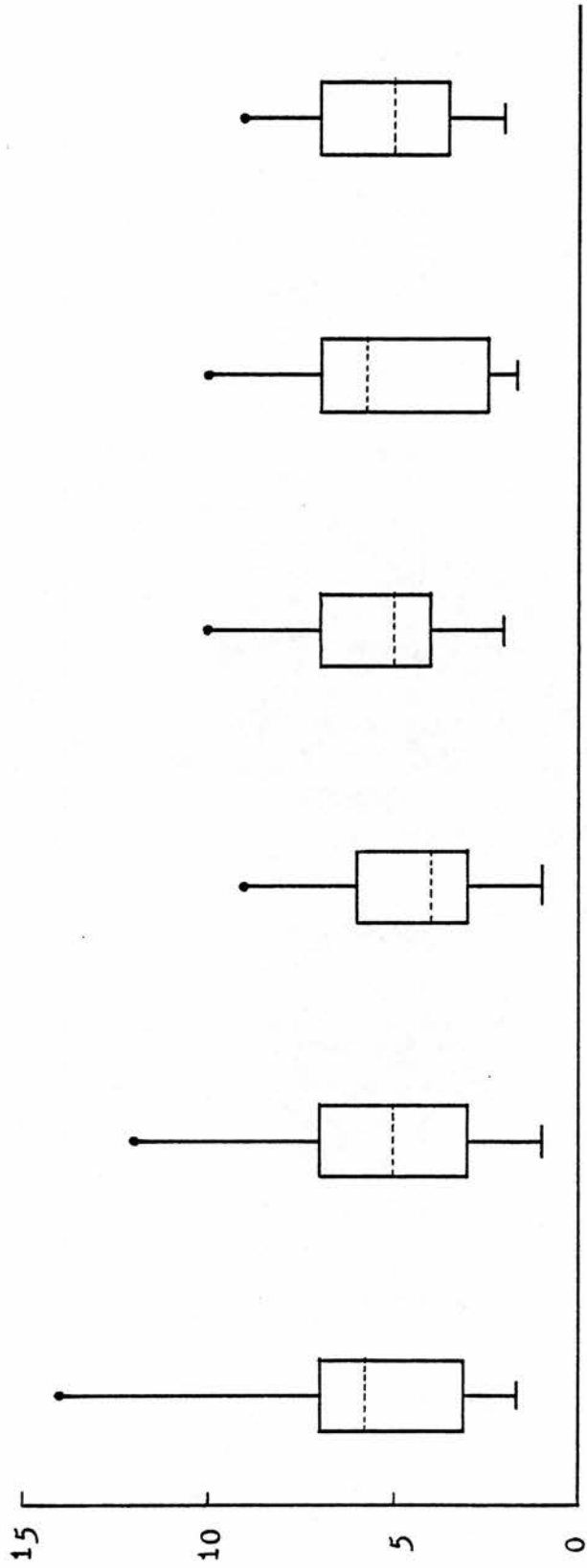


Fig. 8-21. (d). Box-and-whisker plot of values of the degree of integration( $\sigma$ ).

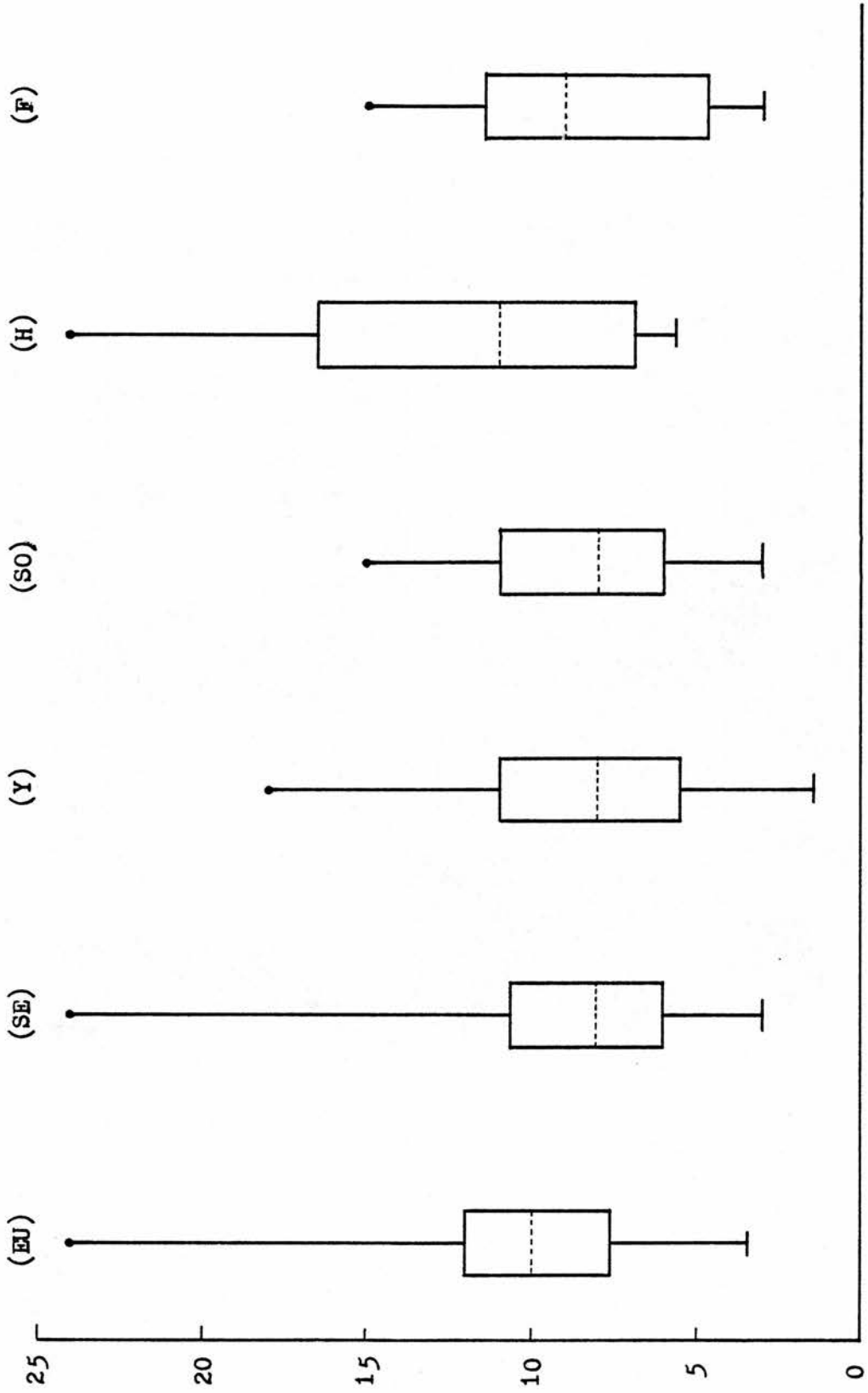


Fig. 8-21, (e). Box-and-whisker plot of values of the rigidity/flexibility index( $r$ ).

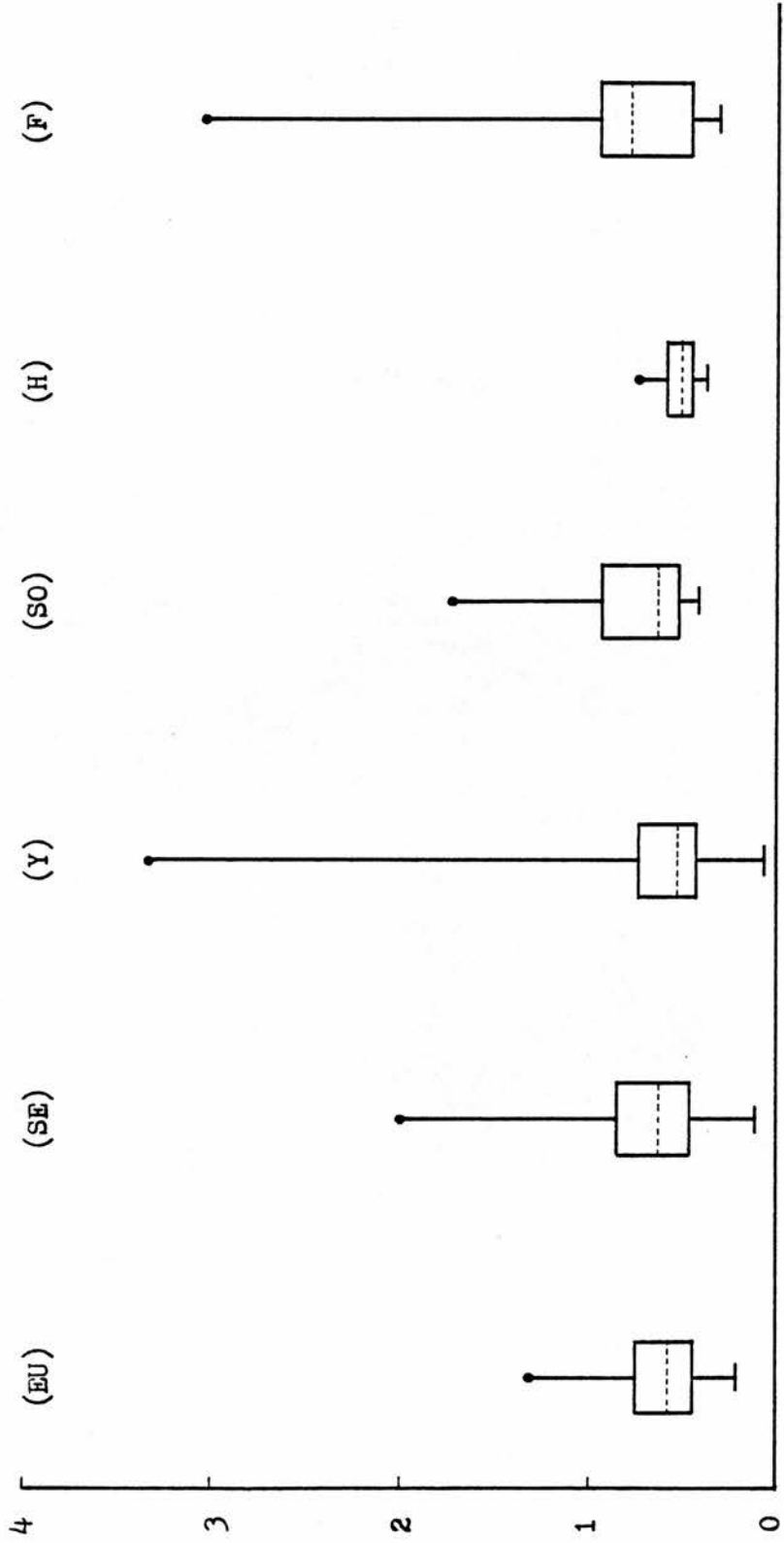
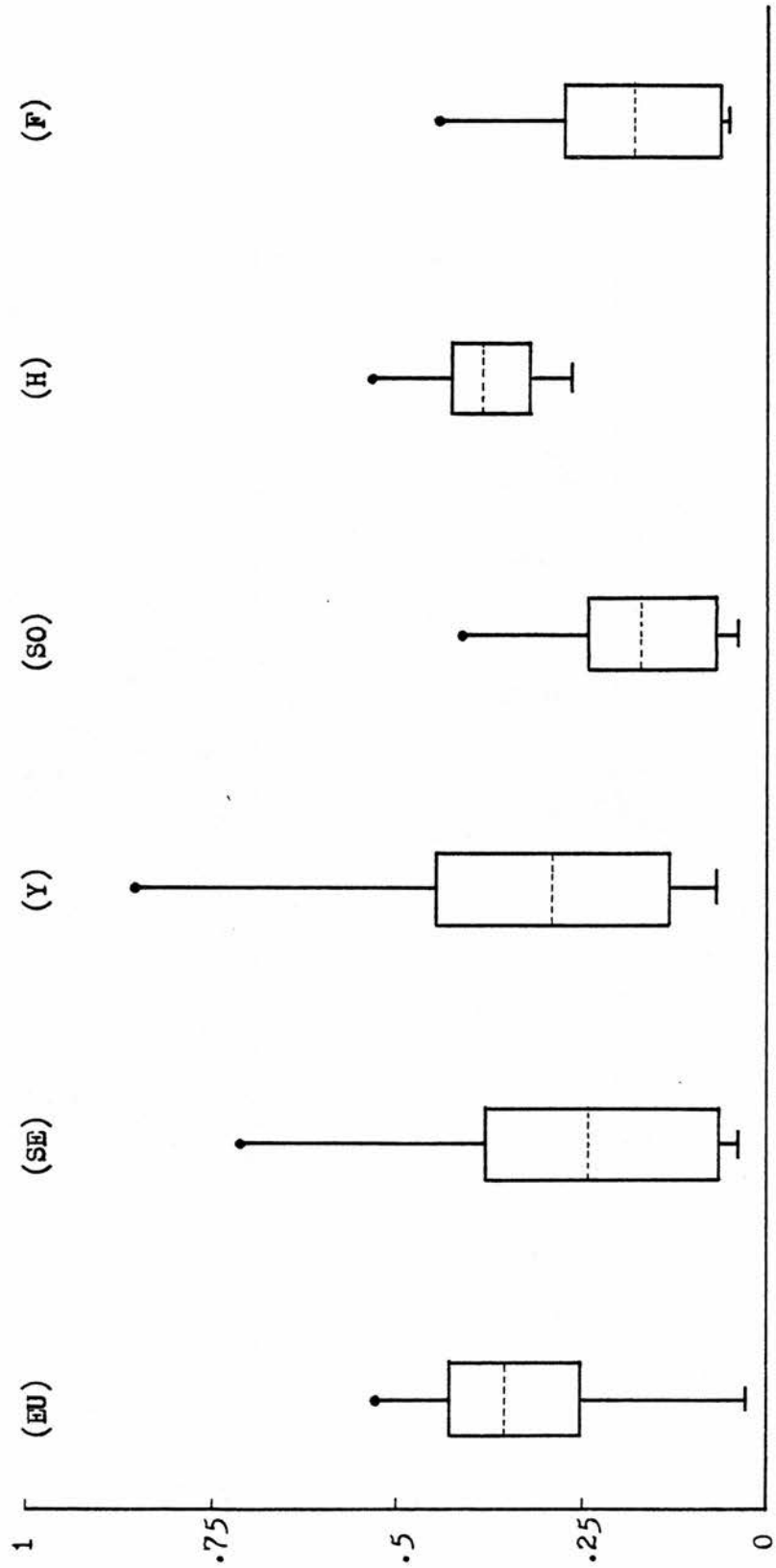


Fig. 8-21, (f). Box-and-whisker plot of values of the organicity index( $\lambda$ ).



the higher portion of the spread in each village. The Ban-Chon, Euin, shows a higher range of dispersion compared with the Min-Chon, Seommaeul, which has the lowest ranges on average. The other Ban-Chon, Yangdong, has lower quartile values compared with Euin. For the lower half range, Yangdong has the lowest quartile values among all the villages. This clearly indicates that the Sang-Min house compounds of Yangdong have the lowest intensity of differentiation on average against those of its kind in other villages. As much as the box-and-whisker plot is asymmetrical, the discrepancy between the two cultural ideologies effecting spatial differentiation is acuter.

In the case of Sopyung, the symmetric dispersion of values and the narrow quartile ranges tell us that space organisation in this village is more or less uniform in respect to the intensity of differentiation. Although Sopyung is a Min-Chon village, it has the highest values for the quartile ranges except for the maximum. Obviously, the high values in both the density of individual regions and the building coverage ratio contributed to this result as shown in table 8-9. Sopyung is not Min-Chon in the conventional sense of Korean traditional society. People of Sopyung have been reshaping their life space, freed from restraints of the old social relations and cultural ideologies. They seem to be drawing more actively towards the newly emerging urban cultural ideology which

Table 8-9. The means of the building coverage( $B/S$ ) and the density of individual regions( $V/S$ ) for each village.

villages	$\bar{V}$	$\bar{B}$	$\bar{S}$	$(\bar{V}/\bar{S})$	$(\bar{B}/\bar{S})$
Euin	31.50	105.00	719.65	0.0520	0.1649
Seommaeul	23.30	69.32	447.48	0.0541	0.1588
Yangdong	23.18	80.38	605.72	0.0464	0.1621
Sopyung	18.42	80.13	329.32	0.0615	0.2645
H collection	57.76	211.75	1615.63	0.0387	0.1384
F collection	19.12	60.46	367.14	0.0554	0.1712

is subjugating both the once superior high culture ideology of the Yang-Ban class and the subordinate folk culture of the Sang-Min. The new orientation of their life is evident in the measured structural parameters as well as at the surface level of their expanding and adapted living spaces. In Sopyung, though the average site area is the smallest among the four villages, the average building area is relatively high as a result of new extensions to meet the increasing demand for interior spaces as shown in table 8-9.

As argued in the case of the examples of section 8.1., the Yang-Ban house compounds generally have lower values in both the building coverage(B/S) and the density of individual regions(V/S). This is confirmed by the mean values of both for H and F as shown in table 8-9. The reason why the H is much stronger in the intensity of differentiation than F, even though F has higher value in both the building coverage and the density of individual regions, is that the building area represented by the number of individual regions per unit site area is larger on average in the case of the Yang-Ban house compounds than for the Sang-Min. This suggests that the high culture community heavily relies on the material (physical) extension of space organisation for energy-information transactions. On the other hand, the folk culture community resorts to the fine grain of spatial differentiation to contain necessary functional and social categories using limited material resources. Accordingly, the high culture ideology is orientated towards externalising the relation of social and functional categories through the physical(material) articulation of cultural conventions while the folk culture ideology tends to attach this relation to the bare conditions of nature distanced from the dominating cultural ideology.

Let us now move on to the degree of connection. The box-and-whisker plots of this are given in fig. 8-21, (b). Here, the values for F are spread between around 0.4 and 0.5 while those of H are spread in a similar interval only with upward shifts of



approximately 0.05 for the maximum and minimum values. The patterns of spread for H and F are opposite to each other. The first and third quartiles are densely populated for H while the second and last quartiles are densely populated for F. There is no big divergence between the two poles in the connectivity of individual regions though F shows the weaker degree of connection though with only around 0.05 margin. The patterns of spread are similar for all surveyed villages except that Seommaeul and Yangdong have substantially higher maximum values and Sopyung has comparatively low quartile values. The three villages other than Sopyung are neutral in the interaction of the two poles concerning the degree of connection with high ranges for the last quartile in Seommaeul and Yangdong while Sopyung has more or less low quartile values.

The case of Sopyung demands attention because it has comparatively low values for the degree of connection but is the strongest in the spread of the intensity of differentiation. The people of Sopyung met the growing need for storage, work, and other ancillary spaces by repeatedly adding discrete simple structures, whenever the demand arose, to the existing ones with a minimum number of connections. It is still to be seen whether this quantitative extension of spatial differentiation, which was carried out through the multiplication of discrete simple structures will be again transformed into another new complex or organic structure in the course of time, resulting a change in its degree of connection.

This investigation invites the hypothesis that there might be certain optimum ranges of connectivity for homogeneous communities. However, at this stage, it is too early to be able to say which socio-spatial factors decide the stabilised ranges of spread of the degree of connection for different species of communities. This could only be claimed after detailed studies of many examples. Nevertheless, as argued in section 7.1., there is a clear indication that the domain of nature also exerts a major constraint on these

ranges because within a surface area an individual region cannot be a neighbour to every other region and therefore every region cannot be connected to every other region.

As far as the degree of segregation is concerned, as shown in fig. 8-21, (c), the division between the two poles seems to be blurred. The H and F collections representing the two poles show similar patterns of spread except that the F collection has slightly higher quartile marks for the lower half range. Generally, all of the four villages tend to a neutral position in terms of the interaction of two poles and all of them present similar patterns of spread. Only the last quartiles of the villages of Andong region(EU & SE) retain wider ranges than those of Wolsung region(Y & SO). In this respect, in the villages of Andong region the activities of energy-information transaction, though slight, are more centred on exterior regions than those of Wolsung region. In Wolsung region, Sopyung has slightly higher values than Yangdong. This is not surprising because, in Sopyung, the extended and added discrete structures are mainly connected through exterior regions. According to the above investigation, in these surveyed village communities, the relative weight given to interior and exterior regions for energy-information transactions is similar and does not depend upon the social constitution of the villages.

As we argued in section 8.2., if on average more clusters of interior regions are separated by one exterior cluster, that is when the degree of segregation is higher, the exterior region takes more weight in carrying out the energy-information transactions in that space organisation because here the functioning of interior clusters need more support from the exterior regions and accordingly connections between interior regions of the same cluster or between different clusters of interior regions rely more on mediation by exterior regions. Insofar as they are concerned with energy-information transactions(as also argued in section 8.2.) exterior regions are associated with contingent, unfixed, and

ephemeral properties of space organisation, which are attributable to the domain of nature, while interior regions come closer to the fixed and more or less permanently structured qualities of space organisation, which pertain to the domain of culture. In this respect, at least in the traditional Korean villages, a space organisation with a strong degree of segregation may be regarded as closely associated with the domain of nature and accordingly with the folk culture ideology while that with a low degree of segregation may be regarded as more closely related to the domain of culture and subsequently to the high culture ideology. We may extend this argument so far as to say that affiliative societies resort more to the articulation of the interior regions for energy-information transactions while adhesive societies rely more on the exterior-centred space organisation. Adhesive social relations would easily be contained in the contingent and ephemeral organisations as here there are no permanent reciprocal obligations between members that should be materialised in a fixed structure, and the social relations are always subject to change and are only temporary. On the other hand, affiliative social relations tend to make reciprocal relations permanent to sustain a social group in a stabilised structure so that their spatial organisation needs to be ordered, compartmentalised, and hierarchised in a fixed and permanent structure.

As differentiated individual regions are connected into a whole, so segregated clusters of interior and exterior regions are integrated into a whole for energy-information transactions. As shown in fig. 8-21, (d), the H collection as a whole shows a higher degree of integration compared with that of F, though their patterns of spread in the degree of segregation are similar as shown in fig. 8-21, (c). This shows that the low and high values in the degree of integration are not in general contrasted by the number of interior clusters segregated by one exterior cluster but by the differences in the number of interior regions grouped into clusters. This result is understandable from the point of view that the high culture ideology not only fosters physical(material) extension but

also the articulation of interior regions, which follow the cultural conventions of the time in question. As in the case of the degree of segregation, there are no strong contrasts in the spreads of the degree of integration between the Ban-Chon and Min-Chon villages. Though the general patterns of the spread are similar for all villages, Euin has the highest spread, which means that the exterior spaces of Euin are most highly mobilised in the energy-information transactions relative to other villages. The upper end quartiles of EU, SE, and Y have over-proportionately wide ranges of spread because, in these villages, there are a certain number of Yang-Ban house compounds whose interior clusters have large numbers of individual regions.

Without exception, the spreads for the degree of integration are highly skewed towards the lower half range whereas those of the degree of segregation are mildly skewed in the same direction. This tells us that, in these villages, the weight put on exterior regions in energy-information transactions are determined more by the number of individual regions of the interior clusters than by the number of interior clusters related to exterior clusters. The burden on exterior regions increases more sharply with the increase in the size of interior clusters than with the number of interior clusters. Also, in the lower half range, the difference between house compounds in the degree of integration is smaller than in the upper half range. These facts lead to the suggestion that, when the spread for the degree of integration is inclined towards the higher range, the discrepancies in the degree of integration between house compounds become acuter and exterior regions are charged with the increasing burdens of energy-information transactions. The articulation of interior regions mainly contributes to this effect. On the other hand, when the spread for the degree of integration approaches nearer to the lower range, the role of exterior regions is more determined by the number of interior clusters than by their size because the Sang-Min house compounds are less associated with the physical extension and the articulation of interior regions.

As shown in fig. 8-21, (e), the H and F collections show a strong contrast in their spreads of the r/f indices. Here the values for F are generally much higher than those for H and the quartile ranges for F are far wider than those for H. For all four villages the spreads of the r/f indices are strongly skewed towards the lower half range and this indicates that the difference in the r/f indices varies widely among the space organisations of rigid structure whereas those of flexible structure have much smaller differences in the r/f index. As a result, in each village, the collection of the folk culture house compounds pulls the values of the r/f index into the wide ranges of high quartile values while the collection of the high culture house compounds pulls the r/f index into the narrow ranges of low quartile values. Generally the Ban-Chon villages retain the lower ranges of spread as in the cases of EU versus SE and Y versus SO. The fact that Sopyung retains the highest quartile values, except for the maximum value, is understandable when considering that here house compounds are largely composed of discrete structures added to existing ones without being amalgamated. In the case of Yangdong, the discrepancy between the two poles is greatest and this well illustrates that, in this village, the Yang-Ban and Sang-Min have the most divergent living conditions as well as that the social barriers are higher than in other villages. Though mildly, a similar indication is found in the case of Seommaeul.

As was discussed in section 8.3.1., each of the tree structure graph and polygon structure graph represents a distinctive system of pathways of energy-information embedded in a space organisation. As illustrated by the example of Y43 in fig. 8-5 and fig. 8-14, (b), any movement through the pathways ends up in a dead-end space in the system of pathways represented by the tree structure graph while in that represented by the polygon structure graph this movement circles throughout the spaces included in it. In this respect, the former may be called the end-space system and the latter the circulation system of that space organisation. As shown in the example mentioned above, the final destination of the movement

through the end-space system is one space or another where resources of energy-information can be put or stored while the movement through the circulation system does not halt but continues so that resources of energy-information can be carried and distributed easily. This argument does not imply necessarily either that the resources of energy-information put in spaces of the end-space system are not involved in energy-information transactions or that the end-space system is totally excluded from the process of the transactions. By the same token, there is no saying that the spaces of the circulation system have no part in storing energy-information resources or that the circulation system does not carry any burden in putting things and persons in proper locations. On the contrary, the two systems complement each other in so far as putting things and persons in proper locations and circulating these around different spaces are mutually dependent.

The investigation of the spread of the r/f index gives a further understanding of the two poles. People of the folk culture ideology appear to have concentrated more on the end-space system to contain their activities of energy-information transaction while people of the high culture ideology go further with the circulation of resources of energy-information beyond the minimum level of connections between individual regions which is required for putting things and persons in locations. In the domain of nature, the circulation of energy-information beyond a minimum level would be uneconomic while the elaboration of this circulation system is conventionalised in every culture to some degree. Anyhow, the circulation of energy-information could not be materialised before the positioning of it in proper locations is secured. After all, the circulation system of energy-information is adopted to stabilise or strengthen the part-whole relations existing between members of the society.

Though both the organicity index and the r/f index measure the system of pathways of energy-information, the organicity index, particularly, measures the strength of the core regions of space

organisations and the morphism structure graph represents the relations between these core regions while the r/f index mainly focusses on the ratio of strength between the end-space and circulation systems of the energy-information flow. In a way the organicity index may be considered as a more stringent measure although it is in the same category as the r/f index. This is reflected in the spreads of values shown in fig. 8-21, (f), in which villages with a high r/f index retain low quartile values in the organicity index and vice versa. In so far as the organicity index is a stringent measure, the contrast between the two poles is acuter than in the case of the r/f index. The upper three quarters for H are spread over the third quartile value for F and the lower three quarters for F lie below the first quartile value for H. Accordingly, in each village, the collection of house compounds of the high culture ideology may draw the values of the organicity index towards the high range while that of the folk culture ideology pulls them towards the low end.

Though Sopyung has exceptionally low ranges of spread compared with other villages, for each pair of villages in the same region, that is EU versus SE and Y versus SO, the Ban-Chon villages have higher ranges of spread in the organicity index. The proportions of the number of 'inorganic'(rigid) space organisations which have no organic network represented in their morphism structure graphs are 7.5%, 30%, 29%, and 50% for EU, SE, Y, and SO respectively. The large proportion of rigid space organisations is one of the main causes for a village's being drawn towards the low range of spread in the property of organicity. In the investigation of section 8.3., the spaces such as kitchen, front yard, court yard, base, Anbang, Sarangbang and attached Ma-ru spaces are found to be the core regions for the energy-information transactions. The fact that these spaces do not appear in the morphism structure graphs of rigid space organisations does not mean that rigid space organisations do not have core regions of any kind. As can be seen in the tree structure graphs, these spaces have the greatest number of connections in the rigid space organisations but do not

have enough circulatory connections with other regions. In this respect, these spaces in the rigid space organisations may be regarded as quasi-core regions. Though both core and quasi-core regions are the spaces on which the energy-information flow is more or less concentrated relative to other regions, the core regions share the burden of energy-information transactions while the quasi-core regions do not have sufficiently intimate relations with each other to share the burden when necessary. Consequently, the rigid space organisation would be more vulnerable when the weight of the energy-information transactions is concentrated on the quasi-core regions, because there is no substitute for them if they malfunction. If the existence of any society is based on the unimpeded circulation of energy-information, it would need a certain level of organicity in the organisation of its life space. Only the community of the folk culture ideology is suppressed to keep the circulation at its minimum. This is because here people have few options for the elaboration of the circulation of energy-information with their limited material resources. And, moreover, even if they secured a certain level of energy-information resources, their social circumstances subjugated to the dominating high culture ideology do not allow them to manipulate these in their full advantage. More often, for this people, the articulation of energy-information transactions as well as its expression in their life space are refrained.

#### 8.4.2. Correlations of the Structural Parameters

In the last section, we investigated the spreads of values of the structural parameters for each village and their implications for the socio-spatial dialectic. Let us finally move on to the correlations of pairs of structural parameters and to what these imply for the socio-spatial dialectic. First of all, as shown in table 8-10, the correlations between the intensity of differentiation( $\alpha$ ) and the degree of connection( $\beta$ ) are overall very weak, which indicates that there is no correlation between two parameters, and therefore the values of intercept and slope suggest



Table 8-10. Correlation coefficients and related statistics for pairs of parameters.

	EUIN	SEOMMAEUL	YANGDONG	SOPYUNG	H COLLECTION	F COLLECTION
CORRELATION(R)	.000	-.242	.169	-.097	-.158	.130
R SQUARED	.000	.059	.029	.009	.025	.017
SIGNIFICANCE	.500	.027	.139	.346	.272	.309
STD ERR OF EST	3.339	2.255	2.096	1.764	3.845	1.647
INTERCEPT(A)	5.209	9.436	.144	7.469	20.313	.005
SLOPE(B)	.003	-11.987	6.925	-5.701	-24.877	7.344
CORRELATION(R)	.770	.883	.817	.906	.894	.924
R SQUARED	.593	.780	.668	.820	.800	.855
SIGNIFICANCE	.000	.000	.000	.000	.000	.000
STD ERR OF EST	3.070	1.955	2.336	1.305	2.822	1.487
INTERCEPT(A)	2.938	1.343	.985	1.236	1.389	-.232
SLOPE(B)	1.423	1.426	1.605	1.333	2.151	1.687

ALPHA  
(DEP.)

BETA

SIGMA  
(DEP.)

DELTA

Table 8-10. Correlation coefficients and related statistics for pairs of parameters(contd.).

	EJIN	SEOMMAEUL	YANGDONG	SOPYUNG	H COLLECTION	F COLLECTION
CORRELATION(R)	-.608	-.494	-.468	-.373	-.645	-.428
R SQUARED	.370	.244	.219	.139	.416	.183
SIGNIFICANCE	.000	.000	.001	.058	.003	.043
STD ERR OF EST	.100	.148	.165	.109	.061	.118
INTERCEPT(A)	.501	.415	.405	.249	.648	.260
SLOPE(B)	-.277	-.247	-.138	-.101	-.513	-.079
CORRELATION(R)	-.792	-.745	-.654	-.578	-.775	-.770
R SQUARED	.627	.555	.428	.334	.600	.592
SIGNIFICANCE	.000	.000	.000	.005	.000	.000
STD ERR OF EST	.169	.228	.477	.352	.063	.454
INTERCEPT(A)	3.613	3.236	4.611	4.523	2.032	9.281
SLOPE(B)	-6.256	-5.419	-8.112	-8.249	-3.121	-18.569

LAMBDA  
(DEP.)

GAMMA

GAMMA  
(DEP.)

BETA

no significant meanings for the socio-spatial dialectic. One of the main reasons for these low correlations could be the fact that the formulae for measuring the two structural parameters contain elements which are more or less alien to one another ; that is, the building coverage ratio(B/S) versus the number of connections(E) and the number of individual regions(V). Though we would still need to investigate many examples, this observation suggests that the primary activity of space organisation as it is represented by the building area replaced by the number of individual regions per unit site area is not linearly related with the strength of connectivity of that space organisation as it is represented by the ratio of the number of connections to its possible maximum number. If this is true, whether in the Ban-Chon or Min-Chon, the intensity of differentiation is indifferent to the degree of connection.

Secondly, the degree of segregation( $\zeta$ ) and the degree of integration( $\sigma$ ) are strongly correlated and therefore here the regression slopes and intercepts describe relatively accurately the relation between the two parameters. And also it is recognisable that the two parameters are positively related so that the increase of the values of  $\zeta$  induces the increase in those of  $\sigma$  and the decrease of  $\zeta$  the decrease of  $\sigma$ . However, for the two hypothetical collections H and F, there is no great discrepancy in their slopes. In other words, concerning the correlation between the degree of segregation and the degree of integration, the two poles are neutral in the effect which a change of the degree of segregation has on the degree of integration.

For all of the four villages, a change in the degree of integration responds only mildly to change in the degree of segregation and there is no polar division between the Ban-Chon and Min-Chon. The fact that Yangdong has the steepest slope indicates that, in this village, the difference between any two house compounds in their numbers of connections between the interior and exterior clusters is most sensitive to their degree of integration.

Therefore, in Yangdong, the difference is greatest either in the number of connections between interior and exterior clusters among its member house compounds or in the size of house compounds in terms of the number of individual regions or in both. The fact that Yangdong has the lowest value in the intercept confirms this interpretation. But, for Euin, the slope is flatter while its intercept, that is the bottom limit of the degree of integration in relation to the degree of segregation, is the highest. This suggests that the tension between the two poles is high in Yangdong while it is low in Euin and accordingly the discrepancy between the high culture and folk culture ideologies, especially concerning their influence on shaping the living environment, is comparatively high in Yangdong and low in Euin.

This was immediately felt in the villages during the participant observation of the survey and an overview of the plans of house compounds of the villages, as shown in Appendix I, presents a similar understanding. Especially, the differences between house compounds of the two social strata in their size and the functional diversity point to this interpretation. It is surprising that, though the measures were carried out without any premeditated intention of achieving this outcome, the measured structural parameters reflect what was evident in the real life space. This suggests that the structural parameters and their measures provide an objective framework into which the subjective interpretation of the socio-spatial dialectic can be rooted. As another example : for Sopyung, the influence of the change in the degree of segregation on the degree of integration is the weakest with the flattest regression slope. This means that the tension between the two poles, in this village, concerning the interaction of two cultural ideologies in shaping the life space is minimal. This coincides with the fact that Sopyung is the most homogeneous village of the four in the social constitution of people since it has no dominating Yang-Ban class. As for its social context, so the properties of space organisation for the house compounds in this village are homogeneous. This is indicated in the narrow ranges

of spreads for all the structural parameters except for the r/f index which is the second narrowest, as shown in the box-and-whisker plots of fig. 8-21.

Thirdly, the correlation between the rigidity/flexibility index( $r$ ) and the organicity index( $\lambda$ ) is weak with coefficients of around 0.5 in average. As a result, the interpretation of the values of the slope and intercept for the understanding of the relationship between the two structural parameters may be less reliable than that between the degree of segregation and the degree of integration. This weakness of the correlation may come from the structural constituents of the formulae for measuring the two parameters where the value of the r/f index is derived from the ratio of the numbers of different kinds of connections while the value of the organicity index is derived from the ratio of the numbers of individual regions of different categories. However, the two parameters are negatively related so that an increase in the values of one parameter causes a decrease in the values of the other and vice versa. As shown in table 8-10, the organicity index is more sensitive to changes in the r/f index for H than for F. This is an expected outcome because, as shown in figs. 8-21, (e) & (f), the range of spread of the r/f index is narrow in H compared with F while the ranges for the organicity index are similar in both cases. Consequently, in the H collection, the organicity index is more responsive to the change in the r/f index than in F. This confirms the already argued case that the space organisation of the high culture ideology has a far weaker end-space system than circulation system compared with those of the folk culture ideology.

Generally, for the responsiveness of the organicity index to the change of the r/f index, it is more sensitive in the Ban-Chon than in Min-Chon as they are in the cases of EU versus SE and Y versus SO. On the other hand, the villages of Wolsung region, EU and SE, are less sensitive compared with those of Andong region, Y and SO. These findings suggest that the stronger the circulation system is over the end-space system in a community as a whole the more

variations its individual space organisations have in their organicity. For Sopyung, the slope of the regression between the r/f index and the organicity index is the flattest and its intercept is the lowest and this tells us that as the end-space system is overwhelmingly stronger than the circulation system in this village, there is little margin within which the organicity indices of house compounds can vary with change in their r/f indices.

These interpretations are confirmed by the regression data between the r/f index( $r$ ) and the degree of connection( $\beta$ ) the correlation coefficients of which are over 0.7 in average. As shown in table 8-10, the two parameters are negatively correlated and the r/f index is rather more strongly responsive to changes in the degree of connection in F than in H. This contrast between the two poles implies that, in the community of the folk culture ideology, the r/f index is sensitive to the change in the number of connections because here the range of the spread for the degree of connection is low, as shown in fig. 8-21, (b), in parallel with its overall weakness in its circulation system compared with its end-space system. On the other hand, in the community of the high culture ideology, the r/f index is less sensitive to change in the number of connections because here not only is the spread for the degree of connection comparatively high but also the range of the r/f index is relatively narrow(as shown in fig. 8-21, (e) ) since here generally the circulation system is stronger than the end-space system. The villages of Wolsung region, EU & SE, are more affected in their r/f indices by change in the number of connections than those of Andong region, Y & SO. This is indicated by the values of the regression slope shown in table 8-10. This result vindicates the findings on the relation between the organicity index and the r/f index, that generally the circulation system dominates the end-space system more strongly in Andong region than in Wolsung region. Consequently, in so far as the circulation system is weaker in the villages of Wolsung region, so here the r/f index is more responsive to change in the connectivity condition. This confirms the obvious fact that in a community with a strong

circulation system, energy-information transactions are not much affected by a change in the connectivity condition.

This suggests a general conclusion that in a society where the high culture ideology is dominant, and which pursues the physical (material) articulation of interior regions, the circulation system is more highly developed than the end-space system and this results in great variations in the organicity of the living spaces of its members. On the other hand, in a society where the folk culture ideology is dominant, the circulation system as well as the articulation of the interior regions is kept at a minimum in the space organisation and so there are fewer variations in the organicity between its constituent unit space organisations.

## 8.5. CONCLUSION

In this final chapter, we first established some mathematical models through which the basic topological relations existing in the space organisations of Korean traditional villages could be measured as a means of investigating the socio-spatial dialectic. Some collective properties of these structural parameters were then introduced in order to reach an understanding of the village communities as socio-spatial fields of communication. The understanding thus acquired of the interaction of the two poles in the socio-spatial field of communication led us to some general conclusions about the interactions of the two cultural ideologies of the socio-spatial dialectic.

In line with the arguments raised in chapter 2, the mechanical application of the mathematical models and the statistical model building process were found to be complementary in the explanation of the socio-spatial dialectic. The formulae for measuring structural parameters, derived through deductive reasoning, represent structural relations of constituent elements engrained in the space organisation in question. But, the model thus constructed is in a sense blind beyond the individual domain which

it defines because, though the implications of these structural parameters can be compared and extended to a general understanding, any explanation thus derived is inevitably to a degree uncertain. Nevertheless, without any doubt the model proposed provides a framework within which the investigation of socio-spatial phenomena can be initiated. However, with the help of statistical inference from individual values obtained through the application of that model, the interpretation of the measures reaches a higher level of certainty and this leads to a general understanding of a community as a socio-spatial field. In this respect, the two processes of investigation support each other for an overall understanding of the same socio-spatial phenomenon.

In chapter 5, we defined the two poles of the socio-spatial field of communication as the two complementary social spaces where the high and folk culture ideologies interact. There one pole was attributed to the social space of the folk culture ideology which is closely associated with the domain of nature and adhesive social cohesion while the other was identified as that of the high culture ideology which is more strongly reflected in the domain of culture and in affiliative social cohesion. In reality, whether it is the Ban-Chon or Min-Chon, the properties of the two poles are not manifest in every phenomenon of the life space. This is why the two hypothetical collections were used as a kind of barometer to detect the interaction of two poles in the socio-spatial field of communication. Here, the two poles do not carry any preconceived standards or fixed value judgments in their representation of particular phenomenon of the socio-spatial field. These can only be found through the use of proper frameworks since the properties of the two poles are ingrained in the individual events and their collective relations constituting the phenomenon in question.

As described in this chapter, the properties of the two poles which were inferred from the artificial H and F collections, contrast strongly in the cases of the spreads of  $\alpha$ ,  $\sigma$ ,  $\tau$ , and  $\lambda$  and in the correlations between  $\lambda$  and  $\tau$  and between  $\tau$  and  $\beta$ .



The differences are blurred in the remaining cases. On the other hand, regardless of the contrast or otherwise of the two poles in the artificial collections, in the real villages, the contrast is strong in the spreads of  $\alpha$  and  $\lambda$  while it is weak in the spreads of  $\beta$ ,  $\zeta$ ,  $\sigma$ , and  $\tau$  and in all cases of the correlations. The division of poles corresponds with the distinction of the Min-Chon and Ban-Chon in the spreads of  $\zeta, \sigma$  (mildly) and  $\lambda$  (strongly) and the correlation of  $\lambda$  and  $\tau$  (mildly) whereas there is no correspondence in the remaining cases. These apparent irregularities concerning the interaction of the two poles eloquently reveals the picture of the socio-spatial phenomenon as it is in reality in these villages and does not suggest inconsistency of the measures of the structural parameters. Insofar as the possibilities and limitations of the measures are well appreciated, this irregularity turns out to be a reasonable result which can only be read coherently through the cultural understanding of the communities.

The "subjective experimentation" executed in establishing these objective measures disclosed some features of the socio-spatial dialectic. Any society exists intact as a social entity through certain part-whole relations established among its members and these part-whole relations are bound to the social relations of adhesion and affiliation in connecting the members into a single whole. In the society where affiliative association is dominant, people consolidate their vertical social relations linked to the reciprocal obligations between members through the articulation of interior spatial regions. These are more or less fixed and permanent in their physical(material) extension in conformity with the value system of the dominating cultural ideology of the time. This constitutes the basis of spatial organisation for the people of the high culture ideology.

On the other hand, in the society where adhesive social cohesion is dominant, insofar as here social relationships and the attached obligations between members are temporary in the widest sense,

people can easily maintain the horizontal part-whole relations by containing their activities in the contingent and unfixed exterior regions without resorting too much to materialised cultural conventions. This is the basis of spatial organisation for the people of the folk culture ideology.

The people of the high culture rely on externalising functional and social categories through the elaboration of permanent structures ; while those of the folk culture do so through the fine grain of differentiation within a limited material extension, internally attached to the domain of nature for energy-information transactions. This is so because, for the people of the folk culture, social relations, world view(or religious belief), and modes of production are not geared towards communication measures externalised in cultural conventions. Whether this society formed its part-whole relation out of the pure necessities of existence or out of imposed social conditions, the part-whole relation which characterises this society relies less on the structured system of the exchange of energy-information between groups or between its members than on the intimate encounter with nature, for example, in farming, divination, and ephemeral associations. Anyhow, in the socio-spatial field of communication, the stable part-whole relation engrained in a society can be continuously maintained through the regulated exchange of energy-information. For the people of the folk culture ideology to contain this requirement in their life space, there is no need to articulate a circulation system in their space organisation beyond a certain minimum level since their end-space system secures proper store of the resources of energy-information because this society is not based so much on communication through conventionalised cultural objects carrying social values as on intimate(internal) encounter with the domain of nature.

In contrast, for the people of the high culture, their vertical part-whole relations are guaranteed by the conventionalised and elaborated system of exchange of energy-information so that this is

made explicit in the circulation system of their space organisation to strengthen further their affiliative social solidarity.

In the end, the two poles are complementary to one another in the socio-spatial dialectic so that in reality any socio-spatial phenomenon manifested in the socio-spatial field which is inhabited by any social group follows the interaction of the two poles in a ceaseless fluctuation from one pole to the other.

## CHAPTER 9. CONCLUSION

Throughout this thesis, we have pursued the dialectic between space and society by looking into the interactions between its constituent opposite but complementary essences. The dialectical arguments were followed not as a method but as a cosmological and ontological principle. When considering the interaction between space and society, as society is a totality of the invisible relations between people so it is also the manifestation of these relations in physical extension. Here, space as a living environment of a community reflects the social relations of the inhabitants quite as it appears as an organised structure in its physical dimension.

In this respect, the organisation of space carries the social context of its occupiers and a society can only sustain itself through the medium of its organised physical extension. The aim of this study has been to detect the non-material, invisible relations embedded in the material extension of the space organisation. For this task, we have adopted some "detective" measures as natural scientists do to explore the natural world. The phenomenon in question, whether it be natural or socio-cultural, is not readily available to the human mind in conventional ways. The investigation of socio-spatial phenomena presupposes a cultural understanding of the people in question since their life space is a nexus of events lived by them as a community, and the same pattern of spatial relations might carry quite different implications for the socio-spatial dialectic of a different community.

In investigating the interaction between space and society, an exclusive inclination towards the physical nature of the life space cannot lead to an adequate understanding. The material fabric of living space cannot usefully be regarded either as a thing in nature or as a realisation of certain abstract rules into objects.

Though the life space is not an animate object, its existence is justified only within the capacity of its occupiers. This does not, however, imply that a subjective comprehension is the best way to reach the reality of the socio-spatial phenomenon. Although the exploration of life space merely as physical extension will produce a desert of axiomatic rules or a void of geometric extensions, to the same extent, but with an opposite effect, an exclusive concentration upon the non-physical nature of life space can only lead to a blind subjectivism.

The socio-spatial phenomenon as a reality lived by a community of people can be grasped through an appropriately structured conceptual framework. But the structured ideas will turn out to be a mere husk of reality if they do not come to terms with the processes comprising the phenomenon. Dialectical reasoning provides a clue to the problem of understanding this reality which is both social and spatial, and physical and non-physical.

Following the arguments developed in the thesis, the appropriation of a portion of space by a community is nothing other than the injection of its world view onto the physical plane of extension in nature. This world view reflects the part-whole relation which binds the members of the community into a social unit of one kind or another. The investigation of Korean traditional villages suggests that not one cultural ideology or the other but the interaction of complementary cultural ideologies is at work in shaping people's life space. This line of thought need not be confined to the Korean examples. These interacting cultural ideologies may not appear as high and folk in cultural context of the community concerned. Any analogous pair of poles of the socio-spatial field would be able to contain the general ideas involved here.

Whether it is in the Traditional or Modern, or in the Eastern or Western societies, the interaction of the two poles operates basically in the same way. That is, the dominating cultural

ideology always articulates its value system into the materialised physical extension. Taking only a few examples, the Buddhist culture or the oriental bureaucratic societies of the East and the Roman military or the medieval Christian societies in the West, all invested their resources to express their value systems through the elaboration of material objects in their different ways. Now, modern industrial urban cultural ideologies seem to have taken their turn to dominate. It appears that it is these glorious achievements of the dominating cultural ideologies materialised in their buildings and cities that many architects, architectural historians, and planners praise or even try to emulate.

Whether we should admire the products of the dominating cultural ideologies or not is another ideological question. But the truth of the matter is that even the genuine appreciation of the products of a dominating ideology cannot be obtained by ignoring the role of its complementary pole. This complementary ideology is always attached to the domain which the material articulation of the dominating cultural ideology cannot reach. It is the domain in which people intimately (perhaps internally) communicate with nature. The domain of nature would readily remind people of the origin of their culture as well as the incompleteness of their achievements. In the absence of the proper appreciation of the interaction between these complementary poles, any interpretation of the socio-spatial field must be doomed to failure.

When using the Korean traditional villages as examples of the socio-spatial field, one of the difficult problems was the discrepancy between a space organisation and the historically shifted social context of its occupants. Although, in the villages, most of <sup>the</sup> physical environments remained nearly as when they were built, the social constituents of the villagers had already undergone a remarkable change. The living environment and the life contents of the villagers were no longer intact. Consequently, we had to rely on a more or less idealised description of the surveyed villages. We may presume that, to some extent at

least, this kind of contingency may occur with any other examples since every living community continuously undergoes changes in one way or another.

We could have confined the study of the socio-spatial dialectic to a speculative exploration of the theme and to the construction of conceptual frameworks. There would not then have arisen questions as to gaps between reality and the conceptual framework or between the conceptual framework and explanation. These gaps, we believe, may be further narrowed by refining the conceptual framework developed so far through extensive investigations of various species of communities or of many more of the same kind. However, the immediate challenge lies in sharpening the criteria for defining the individual region, the evaluation of the mathematical models used, and the inclusion of the exterior spaces outside the unit space organisations (the house compounds) in the model.

## APPENDIX M. MATHEMATICAL NOTES

### A) A Note to 8.2.

We mainly adopt here Tutte's definitions and their accompanying ideas and modify them by loosening the rigorous mathematical formal ideas (underlines are mine).<sup>(1)</sup>

- A graph  $H$  is a subgraph of a graph  $G$  if  $V(H) \subseteq V(G)$ ,  $E(H) \subseteq E(G)$ , and each edge of  $H$  has the same ends in  $H$  as in  $G$ . (Tutte, p. 5).
- The set of vertices of attachment of  $H$  in  $G$ ,  $W(G, H)$ , are the vertices of  $H$  that are incident in  $G$  with edges not belonging to  $E(H)$ . (Tutte, p. 6).
- Let  $J$  be a fixed subgraph of a given graph  $G$ . A subgraph  $H$  of  $G$  is said to be detached modulo  $J$ , or to be  $J$ -detached, if  $W(G, H) \subseteq V(J)$ . (Tutte, p. 9).
- We say that  $G$  is connected modulo  $J$  or  $J$ -connected, if it has no  $J$ -detached subgraph other than  $G$  itself and the subgraphs of  $J$ . By extending this definition,  $H$  of  $G$  is connected modulo  $J$ , or  $J$ -connected, if it is connected modulo its subgraph  $H \cap J$ . (Tutte, p. 10).
- A subgraph of  $G$  is called a component of  $G \text{ mod } J$ , or  $J$ -component of  $G$ , if it is  $J$ -detached and  $J$ -connected but not a subgraph of  $J$ . (Tutte, pp. 11-12).

For our study, we modify the concept of the fixed subgraph  $J$  to denote the class of all subgraphs consisted of open dots (exterior space) separated by closed dots (interior space) in the graph-theoretic representation of house compounds and use the symbol  $J_E$  to refer to it. In the same way but inversely, let  $J_I$  denote the class of all subgraphs consisted of closed dots (interior space) separated by open dots (exterior space) in the network. We call any vertex of  $J_E$  and  $J_I$  a vertex of attachment if the vertex of  $J_E$  is incident with edges belonging to  $E(J_I)$  and vice versa. And by extending this definition, we call the edges between vertices of  $J_E$  and  $J_I$  the edges of attachment. The member subgraph  $H_E$  of  $J_E$  is said to be detached modulo  $J_I$ , or  $J_I$ -detached. In the same way,



the member subgraph  $H_I$  of  $J_I$  is  $J_E$ -detached, or detached modulo  $J_E$  (see, fig. M-1).

We use the term component to refer to the connected subgraphs of a disconnected graph. The subgraph  $H_I$  of  $J_I$  is called a component of  $J_I \bmod J_E$  in  $G$ , or  $J_I$ -component of  $G$ , as it is  $J_E$  detached and  $J_I$  connected. By the same token, with only the inversion,  $H_E$  of  $J_E$  is a component  $J_E \bmod J_I$  in  $G$ , or  $J_E$ -component of  $G$ , as it is  $J_I$  detached and  $J_E$  connected. If we use the symbol  $\phi$  for null set,  $H_I \cap J_E = \phi$  and  $H_E \cap J_I = \phi$  and so neither can  $H_I$  be a subgraph of  $J_E$  nor  $H_E$  be a subgraph of  $J_I$ . In our networks of house compounds,  $J_I$ -components are the subgraphs  $H_I$  of  $J_I$  and  $J_E$ -components are the subgraphs  $H_E$  of  $J_E$ .

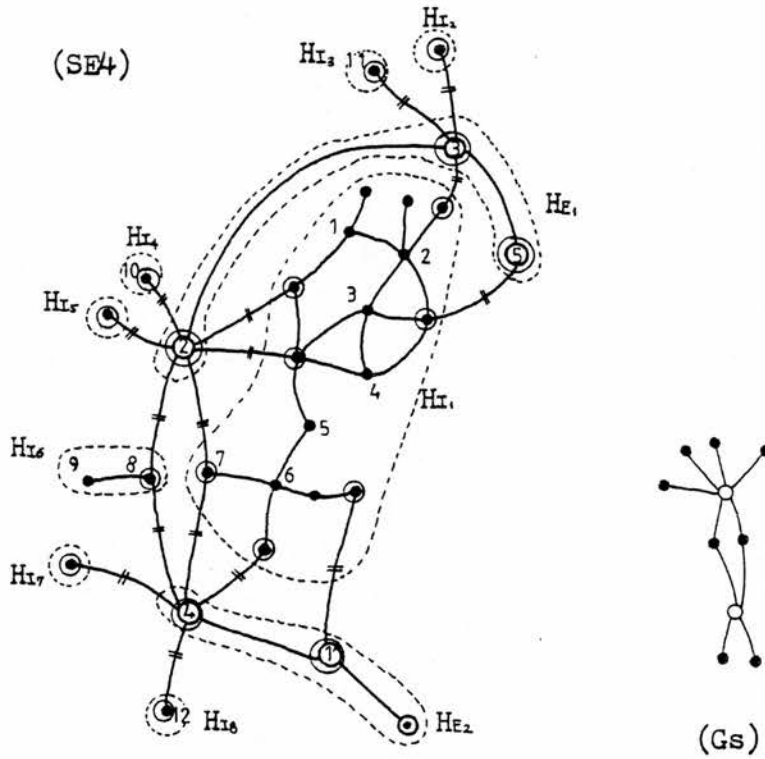
B) A Note to 8.3.

In the theory of functions, which is embedded in the concept of sets as collections of elements, morphism refers to a mapping by which each element of one set is assigned to that of another set. This functional relation is written as  $f:A \rightarrow B$  and  $A$  and  $B$  are referred to as sets and  $f$  as a function which maps each element  $x \in A$  into its corresponding element  $f(x) \in B$ . On the other hand, in category theory, morphism refers to the arrow in the symbol  $f:A \rightarrow B$ , which represents a function as a unitary whole rather than that between elements of different sets. A category  $C$  consists of a collection of objects and a collection of arrows, which are often called morphisms, the composition of which carries the two operations of associativity and identity.<sup>(2)</sup> If we have objects  $A, B, C, D, \dots$  and arrows  $f, g, h, \dots$ ,  $A$  is called the domain of  $f$  which assigns to each arrow  $f$  an object  $A$  and  $B$  is called the codomain of  $f$  which assigns to each arrow  $f$  an object  $B$  :  $f:A \rightarrow B$  or  $A \xrightarrow{f} B$  and,

if  $f:A \rightarrow B$

$g:B \rightarrow C$

$h:C \rightarrow D$



⊙ : Vertex of attachment of  $J_I$

⊙ : Vertex of attachment of  $J_E$

≡ : Edge of attachment

$H_{I_1}, H_{I_2}, \dots, H_{I_9}$  :  $C_I$  component

$H_{E_1}, H_{E_2}$  :  $C_E$  component

$J_I$  : Collection of max. number of connected interior individual regions of space

$J_E$  : Collection of max. number of connected exterior individual regions of space

$G = J_I + J_E, J_E = \bar{J}_I, J_I = \bar{J}_E$

$J_I = \bigcup_i H_{I_i} = H_{I_1} + H_{I_2} + \dots + H_{I_9}$

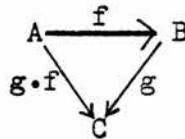
$J_E = \bigcup_i H_{E_i} = H_{E_1} + H_{E_2}$

Fig. M-1.  $J_I$  and  $J_E$  subgraphs.

then  $gf:A \rightarrow C$  (Composition)  
 $h(gf) = (hg)f$  (Associativity)  
 $1_b : B \rightarrow B$  (Identity)  
 $1_b \cdot f = f$   
 $g \cdot 1_b = g$

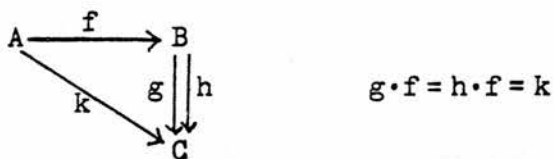
Whereas a function is a single-valued mapping, a morphism is the mapping between objects which are not necessarily sets. The composition of arrows or the collection of morphisms in a category constitute a semigroup which is structured by the operations of associativity and identity. But, in the individual region graphs, every edge as an arrow has an inverse (two-sided) so that every route contains at the same time its inverse route with its origin and destination exchanged. As a result the composition of arrows in the individual region graph includes the inverse function together with those of associativity and identity. Therefore, the collection of morphisms in the socio-spatial field of communication constitutes a group but not a semigroup. Collections of vertices of individual region graphs, which are connected in this composition of morphisms, might be regarded as constituting a metacategory of the meridian system in the socio-spatial field of communication.

We can represent compositions of morphisms in Commutative diagrams. If we have two morphisms  $f:A \rightarrow B$  and  $g:B \rightarrow C$ , such that the codomain of the former is equal to the domain of the latter, the composite  $g \cdot f$  is defined to be the morphism  $A \rightarrow C$ . This is represented in a commutative diagram of arrows. (3)



A morphism  $f:A \rightarrow B$  is defined as an epimorphism if, for every individual region of space  $C$  (or set of individual regions of space), and for every pair of morphisms  $g:B \rightarrow C$  and  $h:B \rightarrow C$  such that  $g \cdot f = h \cdot f$ , we have  $g = h$ . We can represent this equality  $g \cdot f = h \cdot f$  by the morphism diagram  $A \xrightarrow{f} B \xrightarrow[g]{h} C$ . This commutative diagram

implies that any two paths between two given individual regions of space must yield the same overall morphism even when at least one path involves more than one arrow.



The converse image of epimorphism is called the monomorphism. It says that  $f$  is a monomorphism if  $A \xleftarrow{f} B \xleftarrow[g]{h} C$  implies  $g = h$ . Insofar as all the edges are regarded to have two-sided directions, any composition of morphisms includes its inverse image(morphism) as its dual.

## NOTES AND REFERENCES

### Chapter 1. Introduction : The Socio-Spatial Phenomenon

1. Manfredo Tafuri, *Theories and History of Architecture*, Granada Publishing Co. Ltd., London, 1980(c/1976), Chap. 5.
2. K. R. Popper, *Poverty of Historicism*, Routledge & Kegan Paul London, 1976(c/1957).  
Popper criticises the postulation of 'historicism' that there underlie the repeatedly revealing patterns and laws in the evolution of history.
3. Robert Redfield, *Peasant Society and Culture*, University of Chicago Press, Chicago, 1965(c/1956), Chap. 3.
4. Amos Rapoport, *House Form and Culture*, Prentice-Hall Inc., Englewood Cliffe, N.J., 1969, pp. 1-2.
5. Jane Jacobs, *The Death and Life of Great American Cities*, Penguin Books, 1974(c/1961).
6. See,  
Herbert J. Gans, *The Urban Villagers*, Free Press of Glencoe, N.Y., 1962.  
Herbert J. Gans, *The Levittowners*, Allen Lane the Penguin Press, London, 1967.
7. Herbert J. Gans, *People and Plans*, Basic Books Inc., 1968, p. 5.
8. For this argument, see,  
E. T. Hall, *The Hidden Dimension*, Doubleday & Company Inc., N.Y., 1966.
9. George Peter Murdock, *Culture and Society*, University of Pittsburgh Press, 1965, p. 6.
10. George Peter Murdock, *ibid.*, p. 6.
11. Emile Durkheim, *Sociology and Philosophy*, Cohen & West Ltd., London, 1953(c/1951), see, Chap. 1, Individual and Collective Representation.
12. Karl Mannheim, *Ideology and Utopia*, Routledge & Kegan Paul Ltd., London, 1960(c/1936), pp. 2-3.

13. See,  
Stanford Anderson, 'People in the Physical Environment : The Urban Ecology of Streets' : in Stanford Anderson(ed.), On Street, M.I.T. Press, Cambridge Massachusetts, 1978.
14. For the concept of the 'third world', see,  
Karl R. Popper, Objective Knowledge, Oxford Univ. Press 1979, pp. 106-118.
15. Karl R. Popper, *ibid.*, pp. 118-119.
16. David Harvey, Social Justice and the City, Edward Arnold, London, 1973, Chap. 1.
17. Edward T. Hall, The Hidden Dimension, Doubleday & Company Inc., N.Y., 1966.  
Yi-Fu Tuan, Space and Place, Edward Arnold Ltd., London, 1977.  
Robert Sommer, Personal Space, Englewood Cliffs, New Jersey, 1969.  
David Canter, Psychology for Architects, Applied Science Publishers Ltd., London, 1974.  
Herbert J. Gans, The Urban Villagers, Free Press of Glencoe, N.Y., 1962.  
Herbert J. Gans, The Levittowners, Allen Lane the Penguin Press, London, 1967.  
Herbert J. Gans, People and Plans, Basic Books Inc., 1968.  
Jane Jacobs, The Death and Life of Great American Cities, Penguin Books, 1974(c/1961).
18. For this argument, see,  
Derek Gregory, 'Social Change and Spatial Structures' : in Carlstein, Parkes and Thrift(ed.), Timing Space and Spacing Time, Vol. 1, Making Sense of Time, Edward Arnold, London, 1978.  
For the case of urban studies, see,  
Leslie Martin & Lionel March(eds.), Urban Space and Structures, Cambridge University Press, 1975(c/1972).  
And especially, in D. Crowther & M. Echenique's paper 'Development of a Model of Urban Spatial Structure', the term spatial structure is defined as 'the location of different urban activities within a town and the spatial relationships between them'.
19. We can recognise these general trends in the works of :  
Amos Rapoport, *ibid.*.  
Douglas Fraser, Village Planning in the Primitive World, Studio Vista, London, 1968.

- Bernard Rudofsky, *Architecture without Architects*, The Museum of Modern art, N.Y., 1965.
- Paul Oliver(ed.), *Shelter and Society*, Barrie & Jenkins, 1969.
- Paul Oliver(ed.), *Shelter in Africa*, Barrie & Jenkins, 1971.
20. Guidoni suggested that one must consider the territory, the settlement, and the habitation as inseparable. From the point of view of historical materialism, architecture is more a historical than a geographical product, the outcome of a multitude of cultural factors acting diachronically and in reciprocal relationship. See,  
 Enrico Guidoni, *Primitive Architecture*, Academy Edition, London, 1978.
21. Leach argues that Lévi-Strauss replaced the Durkheim-Radcliffe-Brown metaphor by which the articulation of society is seen as 'like that of an organism' by the proposition that the articulation of culture is 'like that of language'. See,  
 Edmund Leach, 'Structuralism in Social Anthropology' : in David Robey(ed.), *Structuralism*, Clarendon Press, Oxford, 1976(c/1973).
22. Paul Oliver(ed.), *Shelter, Sign, and Symbol*, Barrie and Jenkins Ltd., 1975.  
 C. Jencks and G. Bairs(ed.), *Meaning in Architecture*, The Cresset Press, Barrie & Rockcliff, 1969.  
 Geoffrey Broadbent, Richard Bunt, Charles Jencks(ed.), *Signs, Symbols, and Architecture*, John Wiley & Son, U.K., 1980.
23. Singer summarised the comparison and the contrast between the notion of semiotic and semiology. Both aimed at a general theory of signs and symbol systems, and both analysed the nature of signs in relational and structural terms rather than as 'substances and things'. Both also regarded linguistic signs as arbitrary in the sense that the meanings of such signs generally depend on social conventions between the signs and the objects they denote.  
 M. Singer, 'For a Semantic Anthropology' : in T. Sebeok(ed.), *Sight, Sound and Sense*, Indiana University Press, 1978.
24. M. Gandelsonas, *Semiotics as a Tool for Theoretical Development*, EDRA, 1973, p. 327.  
 Gandelsonas views the relationship between theory and ideology as a continuous struggle where ideology defends a type of knowledge whose major effect is the preservation of existing systems and their institutions rather than the explanation of reality. Also see,  
 Diana Agrest and Mario Gandelsonas, 'Semiotics and the Limits

- of Architecture' : in Sebeok T. A.(ed.), A Perfusion of Signs, Indiana University Press, Bloomington, 1977.
25. B. Hillier, A. Leaman, P. Stansall, M. Bedford, 'Space Syntax' : in Environment and Planning B, 1976, Vol. 3.
- Also, see,  
B. Hillier & J. Hanson, The Social Logic of Space, Cambridge University Press, Cambridge, 1984, Chapter 2.
26. For this argument and Alexander's arguments on the form-making process of the two cultures, see,  
C. Alexander, Notes on the Synthesis of Form, Harvard University Press, 1964.
27. C. Alexander, A Pattern Language, Oxford University Press, 1977.  
C. Alexander, The Oregon Experiment, Oxford University Press, 1975.
- For some evaluations and criticisms on Alexander's works, see,  
L. March, 'The Logic of Design and the Question of Value' : in, L. March(ed.), The Architecture of Form, Cambridge University Press, 1976.
28. L. Wittgenstein, Tractatus Logico-Philosophicus, Kegan Paul, Trench, Trubner & Co., Ltd., London, 1922.
29. See papers published since 1974 in this quarterly journal ; Environment and Planning B, Pion Press, London, and Cambridge Urban and Architectural Studies series, especially ;  
L. Martin & L. March(eds.), 1975(c/1972), *ibid.*..  
L. March(ed.), (1976), *ibid.*..
30. Karl R. Popper, The Logic of Scientific Discovery, Hutchinson of London, 1977(c/1959), pp. 34-53.  
Gustav Bergmann, The Metaphysics of Logical Positivism, The University of Wisconsin Press, Madison, Milwaukee, and London, 1967(c/1954).
31. Pierre Thévenaz, What is Phenomenology ?, Quadrangle Books, Chicago, 1962.  
Edo Pivčević(ed.), Phenomenology and Philosophical Understanding, Cambridge University Press, Cambridge, 1975.
32. Eugène Minkowski, Lived Time, Northwestern University Press, Evanston, 1970(c/1933).
33. For the representative phenomenological approach in architecture, see,  
Christian Norberg-Schulz, 'Kahn, Heidegger and the Language of



- Architecture' : in *Oppositions*, Fall, 1979:18, M.I.T. Press, pp.28-47.
- Christian Norberg-Schulz, *Genius Loci — Towards a Phenomenology of Architecture* —, Academy Edition, London, 1979.
- Christian Norberg-Schulz, *Existence, Space & Architecture*, Studio Vista, London, 1971.
- The typical examples of positivistic approach can be found in most papers published, since 1974, in *Environment and Planning B*, Pion Limited, U.K., and also see,
- Leslie Martin & Lionel March(ed.), *Urban Space and Structure*, Cambridge University Press, 1975(c/1972).
- Lionel March(ed.), *The Architecture of Form*, Cambridge University Press, 1976.
34. For this argument, see,  
 C. Alexander (1964), *ibid.*.  
 C. Alexander et al. (1977), *ibid.*.
35. For the concept of autonomy of man-made product, see Popper's postulation on the term 'Third World'.  
 Karl R. Popper, *Objective Knowledge*, Oxford, at the Clarendon Press, 1979(c/1972), Chaps. 3-4.
36. For this argument, see,  
 Jeong-Keun Lee, 'Collective Representation and Yin-Yang Dialectics' : in *Edinburgh Architecture Research*, Vol. 8, 1981, University of Edinburgh, Edinburgh.
37. Noam Chomsky, *Syntactic Structures*, Mouton Publishers, The Hague, 1975(c/1957).  
 Noam Chomsky, *Aspects of the Theory of Syntax*, The M.I.T. Press, Massachusetts, 1976(c/1965), Chap. 1.
38. B. Hillier, A. Leaman, P. Stansall, M. Bedford, *ibid.*.  
 B. Hillier & J. Hanson, *ibid.*, Chap. 2.
39. Lévi-Strauss, in the study of social structures of Central and Eastern Brazil, also once warned that the manifest surface phenomena exhibited in the space organisation could be entirely illusory and even contradictory to reality. See,  
 Lévi-Strauss, *Structural Anthropology*, Penguin Books, 1977(c/1963), Chaps. 7-8.
40. Raymond L. Wilder, *Evolution of Mathematical Concepts*, John Wiley & Sons Inc., N.Y., 1968, Chap. 5.

41. The latest examples of the tendencies towards greater abstraction in social sciences are shown in geography and archaeology. See,  
Richard J. Chorley & Peter Haggett(eds.), Models in Geography, Methuen & Co. Ltd., 1967.  
David L. Clarke(ed.) Models in Archaeology, Methuen & Co. Ltd., 1972.
42. See,  
C. Norberg-Schulz (1979), *ibid.*.
43. B. Hillier, A. Leaman, P. Stansall, M. Bedford, *ibid.*.  
B. Hillier & J. Hanson, *ibid.*.
44. Christopher Alexander, Notes on the Synthesis of Form, Harvard University Press, 1977(c/1964).
45. Lucien Lévi-Bruhl, The Notebooks on Primitive Mentality, Basil Blackwell, Oxford, 1975(c/1949).

## Chapter 2. The Socio-Spatial Dialectic

1. Lancelot Law Whyte, Accent on Form, Routledge & Kegan Paul, London, 1955, Chaps. I & II.  
Lancelot Law Whyte, 'Atomism, Structure and Form' : in George Kepes, Structure in Art and Science, Studio Vista, London, 1965.
2. Edmund Leach, 'Structuralism in Social Anthropology' : in David Robey(ed.), Structuralism, Clarendon Press, Oxford, 1976(c/1973), p. 39.
3. M. Singer, 'For a Semantic Anthropology' : in T. Sebeok, Sight, Sound, and Sense, Indiana University Press, 1978, p. 202.  
G. Baird, 'La Dimension Amoureuse' : in Arena Architectural Journal 6/67 ; reprinted in C. Jenck & G. Baird, Meaning in Architecture, Barrie & C. Rockcliff, 1969.
4. Piaget expounded the ways in which structuralist ideas are employed and developed in many disciplines. See,  
Jean Piaget, Structuralism, Routledge & Kegan Paul, London, 1971(c/1968).
5. Karl R. Popper, Conjectures and refutations, Routledge & Kegan Paul, 1969(c/1963), Chap. 5.

6. R. Boudon, *The Uses of Structuralism*, Heinemann Educational Books, 1971, p. 140.
7. Saussure draws four dichotomies as the distinctive linguistic properties ; substance/form, syntagmatic/paradigmatic, langue/parole, and synchronic/diachronic. For the structural concepts of his theory, see,  
John Lyons, 'Structuralism and Linguistics' ; in D. Robey(ed), *ibid.*.  
Ferdinand De Saussure, *Course in General Linguistics*, Fontana/Collins, Glasgow, 1978(c/1959).
8. F. Saussure, *ibid.*, Part 1, Chap. 1.
9. Lévi-Strauss, *Structural Anthropology*, Penguin Books, 1968(c/1963), Chaps. II & V, (p. 33).
10. For the structural phonology of Prague School, see,  
Simon Clarke, *The Foundations of Structuralism*, The Harvester Press, Sussex, 1981.  
Roman Jakobson, *Selected Writings*, Vol. II, *Word and Language*, Mouton, Hague, 1971.  
N. Troubetzkoy, *Principles of Phonology*, University of California Press, 1969.
11. For the concepts of the linguistic universals, deep and surface structures, and transformation, see,  
N. Chomsky, *Aspects of the Theory of Syntax*, The M.I.T. Press, Cambridge, Massachusetts, 1976(c/1965), pp. 15-17. & pp. 27-29.  
N. Chomsky, *Cartesian Linguistics*, Happer & Row, N.Y., 1966, pp. 31-51.  
The base system consists of the rules that generate the underlying grammatical relations with an abstract order (the rewriting rules) whereas the transformational system includes the rules of deletion, rearrangement, adjunction, and so on. (*ibid.*, p. 42).
12. When Leach labels Lévi-Strauss' approach a rationalistic one, rationalism in question is different from that of Descartes in that here it refers to the imaginative operations of human mind to form the structure of ideas. See,  
Edmund Leach, *Culture and Communication*, Cambridge University Press, Cambridge, 1976, Chap. 1.  
Ino Rossi, 'Structuralism as Scientific Method' ; in Ino Rossi(ed.), *The Unconscious in Culture*, E. P. Dutton & Co., Inc., N.Y., 1974.

13. For the discussion of social structure or of structure, see,  
C. Lévi-Strauss, *Structural Anthropology*, Penguin Books,  
1977(c/1963), Chap. XV.  
Radcliffe-Brown, *Structure and Function in Primitive Society*,  
Routledge and Kegan Paul, 1976(c/1952), Chap. 10.
14. For the discussion on the concept of model, see,  
C. Lévi-Strauss, *ibid.*, pp. 280-289.
15. Lévi-Strauss showed that, among Bororo Villagers, 'spatial  
configuration reflects not the true, unconscious social  
organisation but a model existing consciously in the native  
mind, though its nature is entirely illusory and even  
contradictory to reality'. See,  
C. Lévi-Strauss, *ibid.*, Chaps. 7-8.
16. Chomsky also reinstates the Saussurian distinction between  
'langue' and 'parole' in his synonymous terms of 'competence'  
and 'performance'. See,  
N. Chomsky, *Aspects of the Theory of Syntax*, The M.I.T. Press,  
Massachusetts, 1976(c/1965), pp. 3-14.
17. C. Lévi-Strauss, *The Raw and The Cooked*(Tr. by J. & D.  
Weightman), Jonathan Cap., London, 1970.
18. Chomsky adopted hypothetico-deductive approach for his study,  
deserting inductivist and behavioristic approach pursued by  
positivistic Bloomfieldian linguists. See,  
John Lyons, *Chomsky*, Fontana/Collins, Glasgow, 1978(c/1970),  
Chap. 3.
19. C. Lévi-Strauss, *Structural Anthropology*, Vol. 2, Penguin Books,  
1978(c/1973), Chap. 1(quotation from p. 8).
20. F. Saussure, *ibid.*, pp. 79-100.
21. For the arguments on the property of latency in physical  
environment and the concepts of 'potential environment' and  
'effective environment', see,  
Stanford Anderson, 'People in the Physical Environment : The  
Urban Ecology of Streets' : in Stanford Anderson(ed.),  
*On Street*, M.I.T. Press, Cambridge, Massachusetts, 1978.  
Herbert J. Gans, *People and Plans*, Basic Books Inc., 1968, p. 5.
22. J. Piaget, *ibid.*, Chap. I.
23. J. Piaget, *ibid.*, p. 140.

24. Ludwig Von Bertalanffy, General System Theory, Allen Lane, The Penguin Press, London, 1971(c/1968).  
Norbert Wiener, Cybernetics, John Wiley & Sons Inc., N.Y., 1949(c/1948).
25. For the discussions on cosmology, see,  
Ivor Leclerc, Whitehead's Metaphysics, George Allen and Unwin Ltd., London, 1958, pp. 224-225.  
Alfred North Whitehead, Adventures of Ideas, Cambridge University Press, Cambridge, 1933, Chap. IX, Science and Philosophy.
26. Thomas S. Kuhn, The Structure of Scientific Revolution (International Encyclopedia of Unified Science, Vol. 2, No. 2), University of Chicago Press, Chicago, 1970(c/1962).
27. Alfred North Whitehead, Process and Reality, Cambridge University Press, 1929, Part II, Chap. X.  
Alfred North Whitehead, Modes of Thought, Cambridge University Press, 1938, p. 73.
28. A. N. Whitehead (1929) *ibid.*, Part II, Chap. I.
29. A. N. Whitehead (1929) *ibid.*, Part II, Chap. II, (direct quotations, p. 24 & p. 25).
30. Ivor Leclerc, *ibid.*, Chaps. IV & V.
31. A. N. Whitehead (1929) *ibid.*, pp. 297-298.  
Sarah Waterlow, Nature, Change and Agency in Aristotle's Physics, Clarendon Press, Oxford, 1982, pp. 93-100.  
Aristotle is believed to have introduced two kinds of concept for change. 'μεταβολή' means change from one state of affairs to another, while 'κίνησις' implies or even means process'. Whitehead's 'conrescence' is perhaps synonymous with former. The latter concept of process is reckoned to be more appropriate to describe the structure reflecting any change manifested in the nature of a substance. The concept of natural change entails that some phenomena of their own nature have the character of leading up to others, while others equally necessarily have the character of being led up to.
32. A. N. Whitehead (1929), *ibid.*, p. 55.
33. Sarah Waterlow, *ibid.*, pp. 1-27.
34. Sarah Waterlow, *ibid.*, pp. 10.
35. Archie J. Bahm, Polarity, Dialectics, and Organicity, Charles Thomas Publisher, Illinois, 1970, pp. 196-201 & pp. 257-281.

36. 'Aufheben' has two derivative meanings of 'cancel' and 'keep' which came from its sense of 'pick up'. This implies that, if something is picked up, it may be no longer there as it was but it is not cancelled only to be lifted and kept at another level. For Hegel, concepts of 'Aufheben' and 'das Aufgehobene' meant : 'What sublimates itself does not thereby become nothing. Nothing is immediate ; what is sublimated, on the other hand, is mediated ; it is that which is not, but as a result, having issued from what had being ; it is still therefore characterized by the determinateness from which it comes'. For the above quotation, see,  
Walter Kaufmann, Hegel, Weidenfeld and Nicolson, London, 1966(c/1965), p.159 & pp. 191-192.
37. Hegel(Tr. by W. H. Johnston & L. G. Struthers), Science of Logic, George Allen & Unwin Ltd., London, 1929(c/1812-1816), Vol. I, pp. 94-95.
38. For this argument, see,  
Ivan Soll, An Introduction to Hegel's Metaphysics, The University of Chicago Press, Chicago, 1969, pp. 111-150.
39. Richard Norman, 'On Hegelian Origins' : in Richard Norman & Sean Sayers, Hegel, Marx and Dialectic : A Debate, The Harvester Press, Sussex, 1980.
40. For the concept of Yin-Yang and its connection with Chinese philosophical ideas, see,  
Fung Yu-Lan, A History of Chinese Philosophy, Princeton University Press, Princeton, 1953, Vol. II, Chaps. II & III.  
Joseph Needham, Science and Civilisation in China, Vol. 2, History of Scientific Thought, Cambridge University Press, 1956, pp. 232-244.
41. Herrlee Glesner Creel, Sinism : A Study of the Evolution of the Chinese World View, The Open Court Co., London, 1929.
42. For I Ching and its relations to other philosophical ideas, see,  
Joseph Needham, *ibid.*, pp. 273-278 & pp. 304-345.  
Fung Yu-Lan, *ibid.*, Vol. I, Chap. XV.
43. For the influence of Yin-Yang concept and neo-Confucianism on Leibniz' philosophy, see,  
J. Needham, *ibid.*, pp. 496-505.  
Hellmut Wilhelm, Heaven, Earth, and Man in the Book of Change, University of Washington Press, Seattle, 1977, pp. 8-11.  
For sceptical modern minds trained in rationalist doctrines who are reluctant to accept this argument, there happens to be good evidence of how this system of thought directly contributed

- in moulding the skeletal framework of the thought of a great philosopher whose views are regarded as making a crucial link to today's thought in science and philosophy. Leibniz contributed his share in an effort to overcoming 'the European antinomy between theological vitalism and mechanical materialism' by adopting the 'correlative thinking' of neo-Confucianism, in which cosmology the concept of Yin-Yang is deeply ingrained.
44. For Yin-Yang concept and the application of this principle in I Ching's symbolic system, see,  
H. Wilhelm, *ibid.*.  
H. Wilhelm, *Change*, Routledge and Kegan Paul, London, 1960, Chap. 3.  
Derk Bodde, 'Harmony and Conflict in Chinese Philosophy' : in Arthur F. Wright(ed.), *Studies in Chinese Thought*, The University of Chicago Press, 1953.
45. For this argument, see  
Fung Yu-Lan, *ibid.*, Vol. II, Chap. X.  
J. Needham, *ibid.*, pp. 453-454.  
Carsun Chang, *The Development of Neo-Confucian Thought*, Vision Press, London, 1958, Chap. 6.
46. J. Needham, *ibid.*, pp. 455-472.  
Fung Yu-Lan, *ibid.*, Chap. XIII.
47. J. Needham, *ibid.*, p. 471(requotation).
48. Lao Tzu, *Tao Te Ching*, Chap. 40, : in M. S. Nam, *Tao Te Ching of Lao Tzu*, Eulew Munwha-sa, Seoul, Korea, 1980(c/1970). This quotation is my translation in English from the Chinese original text with annotations in Korean.
49. Lao Tzu, *Tao Te Ching*, Chap. 42, : in M. S. Nam, *ibid.* ; also, see,  
James Legge(Tr.), *The Texts of Taoism*, Dover Publications, Inc., N.Y., 1962(c/1891), Part 1, pp. 55-56.
50. J. Needham, *ibid.*, p. 466 & p. 478.  
For the philosophy of organism of Whitehead, see,  
J. Needham, 'A Biologist's View of Whitehead's Philosophy' : in Paul Arthur Schilpp(ed.), *The philosophy of Alfred North Whitehead*, Northwestern University, Evanston & Chicago, 1941.  
Roy Wood Sellars, 'Philosophy of Organism and Physical Realism' : in P. R. Schilpp(ed.), *ibid.*.

51. Bertrand Russell, *History of Western Philosophy*, Unwin Paperbacks, London, 1981(c/1946), Book 1, Parts 1-2.  
Philip Wheelwright, *Heraclitus*, Princeton University Press, Princeton, New Jersey, 1959.
52. J. Needham, *ibid.*, Chap. 11, pp. 74-83.  
Fung Yu-Lan, *ibid.*, Vol. I, Chap. IX.
53. James Legge(Tr.), *ibid.*, Part 1, Chuang Tzu Book XVII.
54. Garma C. C. Chang, *The Buddhist Teaching of Totality*, George Allen & Unwin Ltd., London, 1972(c/1971), pp. 60-101.
55. Fung Yu-Lan, *ibid.*, Vol. I, pp. 177-183.
56. Fung Yu-Lan, *ibid.*, Vol. II, pp. 534-542 & pp. 566-571.
57. Han, Tai-Dong, 'A Study of Sequential Double Negation in Vajracchedika Prajna Paramita' : in Yonsei University The 80th Anniversary thesis collection, Yonsei Univ., Seoul, Korea, 1965.  
Garma C. C. Chang, *ibid.*, pp. 102-114.  
J. Needham, *ibid.*, pp. 423-425.

### Chapter 3. Nature and Culture in the Socio-Spatial Dialectic

1. C. Lévi-Strauss, *The Raw and the Cooked*(Tr. by J. & D. Weightman), Jonathan Cap., London, 1970, p. 15.
2. C. Lévi-Strauss, *ibid.*, p. 18.
3. C. Lévi-Strauss, *ibid.*, p. 17.  
Also, for the musical metaphor, see,  
Edmund Leach, *Culture and Communication*, Cambridge University Press, 1976, Chap. 9.
4. C. Lévi-Strauss, *ibid.*, pp. 199-215.
5. For this interpretation, see,  
Edmund Leach, *Lévi-Strauss*, Fontana/Collins, London, 1970, p. 92.
6. Claude Lévi-Strauss(Tr. by Rodney Needham), *Totemism*, Merlin Press, London, 1964(c/1962), Chap. 1.



7. C. Lévi-Strauss, *The Elementary Structures of Kinship*, Beacon Press, Boston, U.S.A., 1969(c/1949), p. 3.
8. C. Lévi-Strauss, *ibid.*, p. 8.  
 For the explanation of kinship structure, Lévi-Strauss adopts Mauss' idea that the reciprocal exchange of gifts in any form is not of a simple functional(economic) necessity but a universal social phenomenon which implies underlying social relations. The incest taboo is reckoned to be maintained not because incest genetically weakens or psychologically damages a species but because the group derives social benefits from its prohibition. The ensuing social benefit is the free circulation of women between social groups, similar to the circulation of goods and services. The different forms of exchange of women among exogamous groups, whether in a closed or an open system of exchange, are the criterion to distinguish between two main types of kinship structure ; elementary structures and complex structures. For this argument, see,  
 C. Lévi-Strauss, *ibid.*, Chaps. 2-5 & 24.  
 M. Mauss, *The Gift*, Routledge & Kegan Paul Ltd., 1970(c/1954).
9. For this argument, see the introduction by F. C. Green to Rousseau's *Discourse sur L'inégalité* : in Jean-Jacques Rousseau, *Discours sur L'origine et Fondements de L'inégalité parmi les Hommes*, Cambridge University Press, 1941.
10. For the arguments on 'Amour de soi' and 'Amour de propre', see, John Charvet, *The Social Problem in the Philosophy of Rousseau*, Cambridge University Press, 1974.  
 J. H. Broome, *Rousseau ; a study of his thought*, Edward Arnold Ltd., London, 1963.
11. Jean Jacques Rousseau, *A Discourse on the Origin of Inequality* : in Rousseau, *The Social Contract and Discourses*, Dent & Sons Ltd., London, 1938(c/1913, English Edition), p. 186.
12. J. J. Rousseau, *ibid.*, pp. 204-218.
13. J. J. Rousseau, *ibid.*, pp. 196-197.  
 Thomas Hobbes, *Leviathan*(edited and abridged by J. Flamenatz), Collins/Fontana, London, 1978(c/1651), Chapters 13, 14, & 15.
14. James Legge(Tr.), *The Texts of Taoism*, Dover Publications, Inc., N.Y., 1962(c/1891), Vol. 1.  
 M. S. Nam, *Tao Te Ching of Lao Tzu*(Chinese original text with annotations in Korean), Eulew Munwha-sa, Seoul, 1980(c/1970).
15. Chuang Tzu, *Book XVII* : in J. Legge(Tr.), *ibid.*,(pp. 383-384).

16. Alfred Schmidt(Tr. by B. Fowkes), The Concept of Nature in Marx, NLB, London, 1971(c/1962), pp. 63-72.
17. A. Schmidt, *ibid.*, pp. 76-79.
18. A. Schmidt, *ibid.*, p. 78.
19. Georg Lukács, The Ontology of Social Being, Vol. 3, London, Merlin Press, London, 1980(c/1978), pp. 3-22.
20. Georg Lukács, *ibid.*, p. 26.
21. G. Lukács, *ibid.*, pp. 99-101.
22. G. Lukács, *ibid.*, pp. 103-104.
23. Seyyed Hossein Nasr, The Encounter of Man and Nature, George Allen and Unwin Ltd., London, 1968, Chap. 1.
24. S. H. Nasr, *ibid.*, Chap III(p. 96 for the direct quotation).
25. George Kingsley Zipf, Human Behavior and the Principle of Least Effort, Addison-Wesley Press Inc., 1949.
26. Ernst Mach, The Science of Mechanics, The Open Court Publishing Co., Illinois, 1960(c/1893), pp. 456-474.
27. P. Haggett, A. Cliff, A. Frey, Locational Analysis in Human Geography, Edward Arnold, 1977, London.
28. August Lösch, The Economics of Location(Tr. by W. Woglom), Yale University Press, New Heaven, 1967(c/1939), Part 2(p. 184).
29. See,  
C. Alexander, 'Perception and Modular Coordination' : in RIBA J. 10/1959.  
The postulation of gestalt psychology on good shapes is complemented by the theory on the reference of perception on learning process. See,  
D. O. Hebb, The Organisation of Behavior, John Wiley & Sons, Inc., N.Y., 1949.
30. K. Koffka, Principles of Gestalt Psychology, Routledge & Kegan Paul, London, 1955(c/1935), Chap. 4.
31. F. Attneave, 'Some Informational Aspects of Visual Perception' : in Psychological Review, Vol. 61, No. 3, 1954.
32. Peter S. Stevens, Patterns in Nature, Penguin Books, London, 1977(c/1974).

33. S. P. F. Humphreys-Owen, 'Physical Principles underlying inorganic Forms' : in Lancelot Law Whyte(ed.), Aspects of Form, Lund Humphries, London, 1968.
34. This idea is suggested in ;  
Peter Pearce, Structure in Nature is a Strategy for Design, M.I.T. Press, Cambridge, Massachusetts, 1978.
35. Steadman follows through the organic analogy for the description of the evolution of designs in man-made objects.  
See,  
Philip Steadman, The Evolution of Designs, Cambridge University Press, Cambridge, 1979.
36. D'Arcy Thompson, On Growth and Form, Cambridge University Press, (abridged edition), 1977(c/1917), pp. 107-119.
37. G. K. Zipf, *ibid.*, pp. 1-7.
38. Reyner Banham, Theory and Design in the First Machine Age, The Architectural Press, London, 1977(c/1960).
39. Paul Oliver(ed.), Shelter and Society, Barrie & Jenkins, London, 1978(c/1969).
40. Charles Jencks(ed.), Post-modern Classicism, Academy Edition, London, 1980.
41. Zipf applied the idea of the forces of Unification and Diversification on three areas ; those of the economy of words in human speech, general determinants of the structure of publications, and the economy of geography. See,  
Zipf, *ibid.*, Chap 2, pp. 170-179, & Chap. 9.
42. While discussing the individual man on the plane of phylogenesis and ontogenesis, Young defined the 'race' as totality, an abstraction ; only the individuals are real.  
See,  
J. Z. Young, An Introduction to the Study of Man, Oxford, At the Clarendon Press, 1971, Chap. 9.
43. Mircea Eliade, The Sacred and the Profane, A Harvest/HHJ Book, London, 1959(c/1957), Chap. 1.
44. Otto Friedrich Bollnow, Mensch und Raum, Verlag W. Kohlhammer, Stuttgart, 1971(c/1963), pp. 123-138.
45. Martin Heidegger, Poetry, Language, Thought, Harper Colophon Books, N.Y., 1975(c/1971), Chap. IV.
46. M. Heidegger, *ibid.*, p. 154.

47. To strengthen the case of this rather conjectural argument, we put forward an established philosopher's reflections on this theme ; see  
 Bertrand Russell, A Free Man's Worship and other essays, George Allen & Unwin Ltd., 1976(c/1917), Chap. 1.
48. Philip Steadman, The Evolution of Design, Cambridge University Press, Cambridge, 1979, Chap. 2.  
 Steadman introduces two kinds of interpretation of the organic analogy ; one for artistic harmony and the other for the functional coherence. But we cannot find any ultimate differences between two interpretations in the manner they employ the concept of the relation between parts and whole in organism. Only the point of emphasis is shifted in its application from one subject matter to another. Considering the interconnection of organic analogies with the development of machine theoretic functionalism, the tripartite relations among organism, mechanism, and buildings of work of art are presented in this book.
49. Alfred North Whitehead, Process and Reality, The Free Press, N.Y. 1979(c/1929), Part II, Chaps I, II, & III.  
 For the concept of quantum adopted here, see, pp. 283-284.

#### Chapter 4. The Socio-Spatial Field of Communication

1. Edmund Leach, Culture and Communication, Cambridge University Press, Cambridge, 1976, pp. 3-7.
2. Harold K. Schneider, Economic Man : The Anthropology of Economics, The Free Press, N.Y., 1974, pp. 147-156.
3. Sahlins criticises the materialist logic that is identified directly and exclusively with the practical interest which is in turn symbolically constituted in the mode of production. (At the same time, logic itself is the system of conception devoid of any social content.) He challenges the old cliché of ecology and biology of natural selection so far as to say that 'before there can be natural selection there is a cultural selection'. See,  
 Marshall Sahlins, Culture and Practical Reason, The University of Chicago Press, Chicago, 1976, Chaps. 4 & 5.
4. C. Lévi-Strauss, Structural Anthropology, Penguin Books, 1977(c/1963), p. 296.

5. C. Lévi-Strauss, *The Raw and the Cooked*(Tr. by J. & D. Weighman), Jonathan Cap., London, 1970, pp. 199-215.
6. C. Lévi-Strauss, *The Elementary Structures of Kinship*, Beacon Press, Boston, 1969(c/1949).
7. Colin Cherry, *On Human Communication*, The M.I.T. Press, Cambridge, Massachusetts, 1966(c/1957), pp. 22-26, p. 13.
8. For the distinction of concepts between energy and information in the theory of communication, see,  
Anthony Wilden, *System and Structure*, Tavistock Publications, 1972, pp. 245-255 & pp. 141-146.
9. For the argument on ecosystems, see,  
Anthony Wilden, *ibid*, pp. 202-212.
10. For Hall's arguments on 'culture as communication', see,  
Edward T. Hall, *The Silent Language*, Anchor Press/Doubleday, Garden City, N.Y., 1973(c/1959).  
E. T. Hall, *The Hidden Dimension*, Doubleday & Co., Inc., Garden City, N.Y., 1969(c/1966).
11. For the arguments on the concept of proxemics, spacing mechanisms in animals, and man's use of space in different societies, see,  
E. T. Hall, *ibid.*, p. 1. Chaps II & XII.
12. For the example which applied this concept to the study of settlement, see,  
Roland Fletcher, 'Settlement Studies' : in David L. Clarke, *Spatial Archaeology*, Academic Press, London, 1977.
13. Roland Fletcher, *ibid.*,  
Fletcher argues that the change of this model is caused by the effects of such factors as inheritance system, social system, copying process of the model of reality by successive generations, the idiosyncrasies of each household, the degree of interaction between the units of the group, and individual idiosyncrasies.
14. For the concepts of 'assimilation' and 'accomodation', see,  
Jean Piaget(Tr. by W. Mays), *The Principles of Genetic Epistemology*, Routledge and Kegan Paul, 1977(c/1970), p. 6 & pp. 22-30.  
J. Piaget, *Biology and Knowledge*, Edinburgh University Press, Edinburgh, 1971, pp. 4-5 & pp. 8-9.

- For the concept of 'abstract reflection', see,  
 J. Piaget(1971), *ibid.*, pp. 27-28 & pp. 319-320.
15. For this archetypal perception of environment by man as exterior and interior, see,  
 Oliver Marc, *Psychology of the House*, Thames and Hudson, London, 1977(c/1972), Chaps. 1-2.
  16. Many surveys on the aboriginal domestic buildings in remote societies show that the circular plan is original and square plans are adopted later due to direct or indirect influences from the outside world. For this argument, see,  
 Ian Areher, 'Nabdam Compounds, Northern Ghana' : in Paul Oliver (ed.), *Shelter in Africa*, Barrie & Jenkins, London, 1976(c/1971).  
 Friedrich Schwerdtfeger, 'Housing in Zaria' : in Paul Oliver (ed.), *ibid.*.  
 Susan Denyer, *African Traditional Architecture*, Heinemann, London, 1978.
  17. For this argument, see,  
 Laurence Sickman and Alexander Soper, *The Art and Architecture of China*, Penguin Books, Middlesex, 1956, Chap. 32(p. 214).  
 Especially for the symbolism of circle and square, see,  
 C. G. Jung, *The Archetypes and the Collective Unconscious*, Routledge and Kegan Paul, London, 1959.  
 Aniela Jaffè, 'Symbolism in the Visual Arts' : in C. G. Jung (ed.), *Man and his Symbols*, Picador, London, 1978(c/1964).  
 According to Jung, the circle symbolises the process of nature or the cosmos as a whole, while the square symbolises the universe conceived by the rational mind of man.
  18. For the discussion on Yantra, see,  
 P. H. Pott(Tr. by Rodney Needham), *Yoga and Yantra*, Martinus Nijhoff, The Hague, 1966.  
 Madhu Khanna, *Yantra*, Thames and Hudson, London, 1979, Chap. 1.  
 Omar Garrison, *Tantra*, Academy Editions, London, 1974(c/1964).
  19. For an account of the Mandala, see  
 Giuseppe Tucci(Tr. by A. H. Brodrick), *The Theory and Practice of the Mandala*, Rider & Co., London, 1961.  
 José and Miriam Arguelles, *Mandala*, Shambala Publications, Inc., Boulder, Colorado, 1972.
  20. Gaston Bachelard(Tr. by M. Jolas), *The Poetics of Space*, Beacon Press, Boston, 1972(c/1958), Chap. 9.

21. Gaston Bachelard, *ibid.*, Chap. 10.
22. For this argument, see,  
Mircea Eliade, *The Myth of the Eternal Return*, Routledge & Kegan Paul, London, 1955(c/1949), Chap. 2.
23. For this discussion, see,  
O. F. Bollnow, *ibid.*, pp. 44-55(p. 50).
24. Christian Norberg-Schulz, *Existence, Space & Architecture*, Praeger Publishers, N.Y., 1975(c/1971), Chap. 4.
25. For this argument, see,  
Martin Heidegger, *Poetry, Language, Thought*, Harper & Row, Publishers, N.Y., 1975(c/1971), Chap. 4.
26. For this argument, see,  
C. Norberg-Schulz, *ibid.*, p. 11 & pp. 17-24.
27. C. Norberg-Schulz, *ibid.*, p. 23.
28. Paul Wheatley, *The Pivot of Four Quarters*, Edinburgh University Press, Edinburgh, 1971, p. 425.
29. Robert Herz, 'The Pre-eminence of the Right Hand : A Study in Religious Polarity' : in Rodney Needham(ed.), *Right and Left*, The University of Chicago Press, Chicago, 1973.
30. Rodney Needham, 'The Left Hand of the Mugwe : An Analytical Note on the Structure of Meru Symbolism' : in R. Needham(ed.), *ibid.*.
31. For the discussions on the concepts of right and left in China, see,  
Marcel Granet, 'Right and Left in China' : in R. Needham(ed.), *ibid.*.
32. For the concepts of feng-sui and its practices in Korea and other parts of the Chinese cultural area, see,  
Chong-Ho Pai, 'A Brief Survey of Folk Topography' : in *Inmum Kwahak*, Vol. XXII, Dec. 1969, The Institute of Humanistic Studies, Yonsei University, Seoul, Korea, (Korean text).  
Byung-Do Lee, *A Study of Koryu Era*, Asea Munwhasa, Seoul, 1980(c/1947), (Korean text).  
Chijun Murayama, *Feng-sui of Korea*, Institute of Folk Studies, Wonkwang University, Korea, 1971(c/1931)(Japanese text).  
Stephen D. R. Feuchtwang, *An Anthropological Analysis of Chinese Geomancy, Vithagna, Laos*, 1974.

Hong-Key Yoon, Geomantic Relationship between Culture and Nature in Korea, Asian Folklore and Social Life Monographs Vol. 89, The Orient Cultural Service, Taipei, 1983.

33. For the following discussion, see,  
Yi-Fu Tuan, Space and Place, Edward Arnold, London, 1977, Chap. 4.
34. For the 'psycho-physiological postural model' of the body, see,  
Paul Schilder, The Image and Appearance of the Human body, International Universities Press, N.Y., 1950, pp. 280-297.
35. Gottfried Wilhelm Leibniz, 'Monadology(1714)' : in Leibniz, Philosophical Writings(ed. by G. Parkinson, Tr. by M. Morris and G. Parkinson), Dent & Sons Ltd., London, 1981(c/1934).
36. Amos Rapoport, Human Aspects of Urban Form, Pergamon Press, Oxford, 1977, pp. 108-114 & p. 133.
37. A. Rapoport, *ibid.*, pp. 118-129.
38. For the arguments on the distinctions and connotations of the concepts of cognition, perception, and association, see,  
A. Rapoport, *ibid.*, pp. 25-28, pp. 31-38, and pp. 316-319.
39. A. Rapoport, *ibid.*, p. 110.
40. Willard Van Orman Quine, From a Logical Point of View, Harper & Row, Publishers, N.Y., 1963(c/1953), Chaps. I & IV.
41. J. Piaget, Biology and Knowledge, Edinburgh University Press, Edinburgh, 1971, pp. 110-111.
42. David Hume, Enquiries concerning the Human Understanding and concerning the Principles of Morals(reprinted from the 1977 edition and edited by L. A. Selby-Bigge), Oxford University Press, London, 1966, Sections II-V.
43. J. Piaget(1971), *ibid.*, pp. 4-6.
44. J. Piaget(1971), *ibid.*, p. 7.
45. A. Rapoport, *ibid.*, pp. 316-319 & pp. 38-40.
46. Here, we adopted the concept of type from Rossi who defines it not as a model to be copied repeatedly but as a constant and permanent structuring principle which is to be found in all 'architectural artifacts' in varied manifestations corresponding to the all aspects influencing the creation of the artifacts. See,



Aldo Rossi, *The Architecture of the City*, The M.I.T. Press, Cambridge, Massachusetts, 1982, pp. 35-45.

47. Sahlins argues that the practical and cultural accounts are the repetitive and cyclical oppositions in the explanations of anthropology. For the first account, the cultural order is conceived as 'the codification of man's actual purposeful and pragmatic action', on the other hand, for the latter account, human action is understood as 'mediated by the cultural design' which imposes order to practical experience. To find one of these reasons as a root for the spatial differentiation is beyond the scope of our study, but from the point of view of our conceptual scheme of socio-spatial dialectic, we take it that both reasons counteract dialectically in the process of spatial differentiation. See,

Marshall Sahlins, *Culture and Practical Reason*, The University of Chicago Press, Chicago, 1976, Chap. 2, p. 55.

48. Torvald Faegre, *Tents*, Chapter 3, John Murray Ltd., London, 1979.

49. Thompson postulates that all aspects of organic forms are the result of retaining an equilibrium which is the condition of 'minimum potential energy'. In analogical way, we extend this concept to the differentiation of space in the built environment. This is a consistent view with that which we elaborated in the preceding arguments about the principle of least effort. See,

D'Arcy Thompson, *On Growth of Form* (Abridged Edition, Ed. by J. T. Bonner), Cambridge University Press, 1977(c/1917), Chap. 4.

50. For Jung's concept of individuation and its relation to conscious and unconscious, see,

C. G. Jung (Tr. by R. Hull), *The Archetypes and the Collective Unconscious*, *The Collected Works*, Vol. 9, Part I, Routledge & Kegan Paul, London, 1959, pp. 275-289.

51. Elsasser defines individuality in a purely formal way by saying that configurational individuality exists 'wherever the number of possible configurations of the systems forming a class is vastly larger than the numbers of the particular class that could actually exist in the real world'. For this argument, see,

W. M. Elsasser, 'Individuality in Biological Theory' : in C. H. Waddington (ed.), *Towards a theoretical Biology* ; Vol. 3, Drafts, Edinburgh University Press, 1970.

For further arguments on the relation between individuality and class, see,

W. M. Elsasser, *The Chief Abstractions of Biology*, North-Holland Publishing Co., Amsterdam, 1975.

Hegel also defines individual within a framework of the dialectic of being and nothing : 'the individual is a relation-to-self through setting limits to everything else ; but these limits thereby also limits of itself, relations to an other, it does not possess its determinate being within itself. - - - - in the metaphysics of being, the individual is simply a determinate something, and in opposition to the independence and self-subsistence of such something, to the finite as such, determinateness effectively brings into play its essentially negative character, dragging what is finite into the same negative movement of the understanding which makes everything vanish in the abstract unity of substance'. See,

G. W. Friedrich Hegel(Tr. by A. V. Miller), Science of Logic, George Allen & Unwin Ltd., London, 1969(c/1812), pp. 113-114.

Hegel regards matter as having individuality determined and developed within itself. His philosophy of nature, especially that of physics, extensively applies this concept to three categories : universal individuality, particular individuality, and total individuality. For this, see,

G. W. Hegel, Philosophy of Nature (Tr. by M. J. Petry), George Allen and Unwin Ltd., London, 1970(c/1969), Vol. II.

52. Lancelot Law Whyte, Accent on Form, Routledge & Kegan Paul, London, 1955, Chap. IV.
53. Bohm regards the tendency towards the fragmentary approach to reality as having been ingrained in the atomistic constitution of our language and mode of thought. Quantum theory and relativity, though differently, have the same implication on the world view of undivided wholeness. For this, see,  
David Bohm, Wholeness and the Implicate Order, Routledge & Kegan Paul, London, 1980, Chaps. 1, 2 & 5.
54. For the arguments on phylogeny and ontogeny in relation to evolution theory, see,  
G. R. de Beer, 'Embryology and Evolution' : in G. R. de Beer(ed.), Evolution, Oxford, At the Clarendon Press, 1938.  
C. H. Waddington, 'The Basic Ideas of Biology' : in C. H. Waddington(ed.), Towards a Theoretical Biology, Vol. 1, prolegomena, Edinburgh University Press, 1968.  
C. H. Waddington, The Strategy of the Genes, George Allen & Unwin Ltd., 1957, Chap. 3.
55. For the argument on the concept of number, see,  
Hermann Weyl, Philosophy of Mathematics and Natural Science, Princeton University Press, Princeton, 1949(c/1927), Chap. II.(especially Sec. 6.)

56. Hermann Weyl, *ibid.*, Chap. II, Sec. 9.

According to Brower's intuitive analysis, the individual place in the continuum (of real number) is defined not by a set but by a sequence of natural numbers. Here, the sequence (of numbers) is created by free acts of choice ad infinitum to represent the continuum. The sequence produced as such implies the individual real number in the continuum. The continuum is no longer understood as an aggregate of fixed elements but as a medium of free becoming. Brower illustrates these ideas through the division scheme of the one-dimensional continuum in the example of a finite line segment.

57. For the arguments on particular and universal, see,

Bertrand Russell, *The Problems of Philosophy*, Oxford University Press, Oxford, 1974(c/1912), Chapters 9 & 10.

Willard V. O. Quine(1953), *ibid.*, Chap. IV.

Rudolf Carnap, *Meaning and Necessity*, The University of Chicago Press, Chicago, 1958(c/1947), pp. 32-43.

P. F. Strawson, *Individuals*, Methuen, London, 1979(c/1959), pp. 117-134, pp. 167-179, & pp. 202-213.

For the argument on member and class, see,

Jean Piaget, *Logic and Psychology*, Manchester University Press, 1953, *An Elementary Introduction to Piaget's Logic* by W. Mays & Chap. III.

58. J. Piaget(1953), *ibid.*, pp. 24-26.

59. For this argument, see,

J. Piaget, *The Child's Conception of Number*, Routledge & Kegan Paul Ltd., London, 1952(c/1941), Sects. I, II, III, IV, VII & VIII.

Also for the genetic epistemology and concept of logic which underlie the basic ideas of this argument, see,

J. Piaget, *The Principles of Genetic Epistemology*, Routledge & Kegan Paul, London, 1977(c/1970).

J. Piaget(1953), *ibid.*.

60. J. Piaget, B. Inhelder, A. Szemicka, *The Child's Conception of Geometry*, Routledge and Kegan Paul, London, 1960, Chap. XII.

The development of logico-mathematical operations is not due to collective subjects (social conventions like social interchange, education), subjective conditions of individual's actions or conscious introspection of subjects, or physical objects but it is constructed by reflective abstraction, starting from the subject's action to objects and co-ordinating the actions autonomously. See,

E. W. Beth & J. Piaget, *Mathematical Epistemology and Psychology*, D. Reidel Publishing Co., Dordrecht-Holland, 1966, Chap. X (especially, Sect. 53).

61. Mannheim postulates that the individualistic subjectivism already contained in medieval thought reached its full bloom in the rationalism from Descartes, Leibnitz, to Kant on the one hand, and in the psychologically oriented epistemology of Hobbes, Locke, Berkeley, and Hume on the other. Mannheim accuses 'individualistic epistemology' and 'individualistic genetic psychology' of their lack of recognition of the social origin of human thought and ideas. For the discussion on the basic ideas of Mannheim's sociology of knowledge, see,

Karl Mannheim, *Ideology and Utopia*, Kegan Paul, Trench, Trubner & Co., Ltd., London, 1936, Chap. I.

62. The methodological individualists' view does not deny that individual dispositions and accordingly 'psychological facts' are conditioned by cultural ideologies in a society. But, they insist that these should be explained as a product of responses by the individuals consciously or unconsciously, to the requirements of their social milieu. For this argument, see,

J. W. N. Watkins, 'Ideal Types and Historical Explanation in the Social Sciences' : in Patrick Gardiner(ed.), *Theories of History*, George Allen & Unwin Ltd., London, 1959.

63. From the holist standpoint, Mandelbaum, for the understanding of the actions of human beings as members of a society, distinguishes 'societal facts', which refer to the forms of organisation, from 'psychological facts' which refer to the thoughts and actions of specific individuals. For him, the statements about 'social facts' cannot exhaustively be reduced to a conjunction of statements consisting of 'psychological facts' without remainder. For Mandelbaum's argument for a holistic view, see,

Maurice Mandelbaum, 'Societal Facts' : in Patrick Gardiner(ed.), *Theories of History*, George Allen & Unwin Ltd., London, 1959.

Gellner also supports the holist view that social facts are external from and independent of individual dispositions (conceivable reaction of human being to circumstances) in a society. See,

Ernest Gellner, 'Holism versus Individualism in History and Sociology' : in P. Gardiner(ed.), *ibid.*

Lukes also gives priority to collective phenomena over the individual in explaining social phenomena. For him, methodological individualism is regarded as excluding unjustifiably the external social forces, structural features of society, and institutional factors by a preoccupation with individuals against so-called collective fictional phenomena in accepting the reality. For this argument, see,

Steven Lukes, *Individualism*, Basil Blackwell, Oxford, 1973, Chap. 17.

64. Even the existence of gods is regarded as one from of religious phenomena which manifest a certain sacred quality produced by society. See,

Emile Durkheim, *The Elementary Forms of Religious Life*, George Allen & Unwin Ltd., London, 1964(c/1915).

65. In traditional societies, according to Durkheim, the social solidarity is founded on the existence of a strongly defined set of norms to which all members of the society conform with common conscience derived from the consciousness of common values and beliefs. In this cohesion of 'mechanical solidarity', according to Durkheim, the level of individuation is kept at minimum as it is in the characteristic manifestations of collective life such as moral norms and repressive sanctions which are tied up with 'conscience collective'. Through the process of 'division of labour' individuation transmuted the conscience collective characteristic of traditional society to new moral ideals of individualism. Collective conscience has been weakened in certain aspects in modern society but it does not mean that collective moral ideals have dissolved rather that they have developed to a new form. 'Organic solidarity' accounts for this newly transformed conscience collective, whereby social unity depends on the organic inter-dependence of occupations between individuals and groups of individuals. Here, 'mechanical solidarity' implies that each individual as a microcosm of the collective type is wholly comparable to every other as it is in the case of machanical structure. On the other hand, 'organic solidarity' stresses that society works by reciprocal relationships between the differentiated functions within divisions of labour as living organisms function likewise ; see,

Emile Durkheim, *The Division of Labour in Society*, The Free Press, N.Y., 1964(c/1933), Chaps. 1-5.

66. For this argument, see,

Gabriel Tarde, *On Communication and Social Influence*, The Univ. of Chicago Press, Chicago, 1969, Chaps. I-III & Introduction by T. Clark.

67. For Durkheim, ideology is a predisposed illusion of human mind which is fixed by habit. From this point of view, Durkheim regards ideology as an obstruction for the objective understanding of social realities. On the other hand, Mannheim distinguishes between two spheres of the concept of ideology : those of the particular and of the total. The particular conception of ideology refers to the conscious deceptions in disguise of one's interests, operative at the psychological level, for the judgment of the opponent's idea.

The total conception of ideology is concerned with the world view corresponding to the total structure of mind of an age or a social group. Mannheim criticises Marx's conception of ideology of being interested in analysing only the opponent's ideas but not its own, even though it is total. For Marx, ideology carries a negative notion of distorted consciousness which conceals social contradictions in the interests of the dominant class. For this argument, see,

Jorge Lorrain, *The Concept of Ideology*, Hutchinson, London, 1979, pp. 45-49 & pp. 91-112.

68. For this argument, see,

Karl R. Popper, *The Poverty of Historicism*, Routledge & Kegan Paul, London, 1979(c/1957), Chaps, II & III.

69. For Popper's criticisms on Mill and following discussions, see, Karl R. Popper, *ibid.*, pp. 71-76.

Karl R. Popper, *The Open Society and Its Enemies*, Routledge & Kegan Paul, London, 1962(c/1945), Vol. II, Chap. 14.

70. For the discussion of Mill's argument about the liberty of individuals, see,

John Stuart Mill, *On Liberty*, Longmans, Green, Reader and Dyer, London, 1874(5th edition), Chaps. III & IV.

71. Fridrich A. Hayek, *Individualism and Economic Order*, Routledge & Kegan Paul, London, 1949, Chap. I.

72. Otto Gierke, *Natural Law and the Theory of Society*, Beacon Hill, Boston, 1957(c/1934), pp. 93-136 & Introduction by E. Barker.

73. Even the anatomy of the cerebral hemispheres shows that the linguistically dominant left side of our brain is in charge of the logical, analytic function of our intellects while the right side works in a global and intuitive fashion. In fact, of course, two sides collaborate(with each other). For this point, see,

Colin Blakemore, *Mechanics of the Mind*, Cambridge University Press, Cambridge, 1977, Chap. 6.

Whyte addresses the same point in conjunction with the atomistic and holistic approaches as follows ; 'the feminine, artistic, poetic, inventive, and imaginative component of human personality uses the holistic approach, while the masculine, analytical, classifying component uses the atomistic method. But we all to some extent use both ; it is a matter of emphasis and degree'. See,

L. L. Whyte, *ibid.*, p. 55.

74. Ernst Nagel, *The Structure of Science*, Routledge & Kegan Paul, London, 1961, pp. 380-397.
75. Nagel, here, defines (1) the 'additive analysis' as the one 'which accounts for the properties of a system in terms of assumptions about its constituents, where these assumptions are not formulated with specific reference to the characteristics of the constituents as elements in the system' and (2) the 'nonadditive analysis' as one 'which formulates the characteristics of a system in terms of relations between certain of its parts as functioning elements in the system' (p. 395). For this argument, see,  
E. Nagel, *ibid.*, pp. 401-427 (especially pp. 421-424).
76. Edmund Husserl (Tr. by J. N. Findlay), *Logical Investigations*, Routledge & Kegan Paul, London, Vol. II., Investigation III, On the Theory of Wholes and Parts.
77. For the Sokolowski's investigation of Husserl's Logic, see,  
R. Sokolowski, 'The Logic of Parts and Wholes in Husserl's Investigations' : in J. N. Mohanty (ed.), *Readings on Edmund Husserl's Logical Investigations*, Martinus Nijhoff, The Hague, 1977.
78. Edmund Husserl, 'The Task and the Significance of the Logical Investigations' : in J. N. Mohanty (ed.), *ibid.*.
79. To help understanding Hegel's 'Science of Logic', see,  
Walter Kaufmann, *Hegel*, Weidenfeld and Nicolson, London, 1966(c/1965), Chapter IV (and especially pp. 188-197).  
G. R. C. Mure, *A Study of Hegel's Logic*, Oxford, At the Clarendon Press, 1950.
80. For the following argument in this paragraph, see,  
Georg Wilhelm Friedrich Hegel (Tr. by A. V. Miller), *Science of Logic*, George Allen & Unwin, London, 1969(c/1812), pp. 512-518 (direct quotation p. 513).
81. Hegel, *ibid.*, p. 514.
82. Hegel, *ibid.*, p. 514.

#### Chapter 5. Two Poles of the Socio-Spatial Field of Communication

1. Taik-Gyu Kim, *A Study on the Structure of A Clan Village*, Iljogak, Seoul, 1979, p. 254, (Korean text).

2. Gyu-Hong Park, 'A Note on Shamanism of Yi Dynasty' : in The Publication Committee, Collections of Theses on Folklore (Dedicated to Professor Suk), Tongmun-Kwan, 1971, (Korean text).
3. Hultkrantz Ake, 'Some Remarks on Contemporary European Ethnological Thought' : in Ethnologia Europaea, Vol. 1, No. 1, 1967.
4. Jai-Suk Choi, A Study of Korean Family, Minjung Sokwan, Seoul, 1966, p. 281, (Korean text).
5. Karl A. Wittfogel, Oriental Despotism, Yale University Press, New Haven, 1957.
6. Joseph Needham, 'Science and Society in East and West' : in Science and Society, Vol. 28, 1964.
7. K. Wittfogel(1957), *ibid.*, Chapters 1 & 2.
8. Seung-Je Ko, A Study on the History of Korean Village Community, Iljisa, Seoul, 1977, (Korean text).
9. J. Needham(1964), *ibid.*.
10. Ki-Baik Lee, A New History of Korea, Iljogak, Seoul, 1976, (Korean text).
11. Joseph Needham, 'Thoughts on the Social Relations of Science and Technology in China' : in Centaurus, Vol. 3, Ejnar Munksgaard, Copenhagen, 1953-1954.
12. Vincent S. R. Brandt, A Korean Village, Harvard University Press, 1971.
13. Kwang-Kyu Lee, 'Social Structure and Cultural Pattern in Korea' : in Cultural Anthropology, Vol. 4, The Korean Association of Cultural Anthropology, 1971, (Korean text).
14. Hoi-Soo Yang, A Study on the Structure of the Korean Farming Village, Korea University Press, Seoul, 1967, pp. 236-239, (Korean text).
15. Kwang-Kyu Lee, *ibid.*.
16. Robert Redfield, The Little Community(a) and Peasant Society and Culture(b), University of Chicago Press, Chicago, 1960, p. 41.
17. R. Redfield, *ibid.*, pp. 143-147.
18. S. Ko, *ibid.*, pp. 268-269.
19. Jai-Suk Choi, A Study on Korean Rural Community, Iljisa, Seoul, 1975, pp. 476-486, (Korean text).



20. J. Choi, *ibid.*, p. 65.
21. Eisuke Yoshiki, *Settlements of Korea*, Seoul, 1933, (Japanese text).
22. For the remaining discussions of this section, see, Jeong-Keun Lee, *A Study on the Spatial Structure of Korean Natural Villages*, Master Thesis, Seoul National University, Korea, 1972, (Korean text).
23. E. S. Higgs & C. Vita-Finzi, 'Prehistoric Economies ; A Territorial Approach' : in E. S. Higgs(ed.), *Papers in Economic Prehistory*, Cambridge University Press, 1972.
24. For the arguments on hunter-gatherer society, see, Claude Meillassoux, *Maidens, Meal and Money*, Cambridge University Press, Cambridge, 1981(c/1975), Part 1, Chap. 1. Marshall Sahlins, *Stone Age Economics*, Tavistock Publications, London, 1981(c/1972), Chap. 1.  
Following Sahlins' views, the hunter-gatherer society was more affluent than ours and they had more leisure time than us. Because they are 'comparatively free of material pressures' and 'has no sense of possession' as a result of the institutionalised modesty of material requirements. The creative adaptation to the ecological imperatives brought by their mode of production keeps the hunter-gatherers within range of the technical means to meet their ends.
25. C. Meillassoux, *ibid.*, Part 1, Chap. 1.
26. Sahlins attributes the Domestic Mode of Production mainly to the early agriculturalist societies. But, for Meillassoux, the marginal hunter-gatherer societies of the transitional period to early agriculturalist societies show the same categories of modes of production in their household managerial system. See, Marshall Sahlins, *ibid.*, Chaps. 2-3.
27. For the following arguments, see, C. Meillassoux, *ibid.*, pp. 22-32.
28. Emile Durkheim, *The Division of Labour in Society*, The Free Press, N.Y., 1964(c/1933), Chaps. 1-5, (also, see, note 64 of chapter 4).
29. Mercea Eliade, *Shamanism*, Routledge & Kegan Paul, London, 1964, pp. 3-13.

30. For the following argument, see,  
Taik-Gyu Kim, *ibid.*, pp. 245-264.  
Gyu-Hong Park, *ibid.*.
31. For the discussion on the shamanic activities of Villagers, see,  
Yul-Kyu Kim, 'Shamanic Village Rite and Popular Thought  
Thereof' : in *Inmun Kwahak*, Vol. 22, The Institute of  
Humanistic Studies, Yonsei University, Seoul, 1969,  
(Korean text).
32. Mercea Eliade, *Images and Symbols*, Harvill Press, London,  
1961, pp. 39-40.
33. Mercea Eliade, *The Myth of the Eternal Return*, Routledge &  
Kegan Paul, London, 1955, p. 12.
34. M. Eliade(1964), *ibid.*, p. 259.
35. Ki-Baik Lee, *ibid.*.
36. Chong-Ho Bai, 'A Brief Survey of Folk Topography' : in *Inmun  
Kwahak*, Vol. 22, The Institute of Humanistic Studies, Yonsei  
University, Seoul, 1961, (Korean text).
37. James Legge(Tr.), *The Li Ki* : F. Max Müller(ed.), *The Sacred  
Books of the East*, Vols. 27-28, Clarendon Press, Oxford, 1885.
38. For the general principles of feng-sui and their practices in  
Korea, see,  
Chijun Murayama, *Feng-sui of Korea*, The Institute of Folklore  
Studies, Wonkwang University, Korea, 1971(c/1931),  
(Japanese text).
39. Chong-Ho Bai, *ibid.*.
40. Joseph Needham, *Science and Civilisation in China*, Vol. 2,  
*History of Scientific Thought*, Cambridge University Press,  
1956, pp. 455-471.
41. J. Needham(1956), *ibid.*, p. 247.
42. For the following discussion of feng-sui, see,  
Chijun Murayama, *ibid.*.
43. C. K. Yang, 'The Functional Relationship Between Confucian  
Thought and Chinese Religion' : in John K. Fairbank(ed.),  
*Chinese Thought and Institutions*, University of Chicago Press,  
Chicago, 1957.
44. J. J. M. De Groot, *The Religious System of China*, Vol. 3.  
Book 1(Disposal of Dead), Part 3(The Grave), Leyden, 1897,  
pp. 1013-1015.

45. Chong-Ho Bai, *ibid.*.
46. Feuchtwang argues against feng-sui as if it is amoral and this-worldly. For him, feng-sui is this-worldly against other-worldly and it is in the realm of nature against that of society. Ancestor worship is oriented towards the past while feng-sui is oriented toward the future in that burial action is exclusively for the living descendants. So feng-sui aims at only this-worldly benefits. Feng-sui is amoral in that feng-sui benefits are not bound up with broad social doctrines and rules of conduct. It exists in the realm of nature, not in that of society, because benefits are to be had without any supernatural aid but by knowing of the laws of natural processes where to place oneself in relation to them. For this, see,
- Stephen D. R. Feuchtwang, *An Anthropological Analysis of Chinese Geomancy*, Editions Vithagna, Laos, 1974.
47. J. Needham(1956), *ibid.*, p. 459.

## Chapter 6. The Network of Topological Relations

1. Piaget and Inhelder once have shown that topological relationships come first, long before projective and euclidean concepts, in the development of child's conception of space. This result suggests that primary spatial concepts are not euclidean but topological and are based on qualitative concepts such as continuity, proximity, separation, enclosure, homomorphism and order. For this argument and the fundamental concepts of topology, see,
 

J. Piaget & B. Inhelder, *The Child's Conception of Space*, Routledge & Kegan Paul, London, 1956(c/1948).

J. R. Munkers, *Topology ; First Course*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1975.

B. Mendelson, *Introduction to Topology*, Allyn and Bacon, Inc., Boston, U.S.A., 1975(c/1962).
2. Without directly referring to graph theory but with the obvious implications, Lewin early introduced topological concepts into psychology. See,
 

Kurt Lewin, *Principles of Topological Psychology*, Mcgraw-Hill Book Co., Inc., N.Y., 1936.

For a general discussion of graph theory and some examples of its application to architecture, see

L. March and P. Steadman, *The Geometry of Environment*, RIBA Publication Ltd., London, 1971, Chaps. 10-14.

For some applications of graph theory to other fields, see,

P. Haggett, A. Cliff and A. Frey, *Location Analysis in Human Geography*, Edward Arnold, London, 1977(c/1965), Chap. 3.

P. Haggett and R. Chorley, *Network Analysis in Geography*, Edward Arnold, London, 1969.

N. Rashevsky, 'Topology and Life : In search of General Mathematical Principles in Biology and Society' : in *Bulletin of Mathematical Biophysics*, Vol. 16, 1954, University of Chicago Press, Chicago, Illinois, 1955.

N. Rashevsky, 'Some Remarks of Topological Biology' : in *Bulletin of Mathematical Biophysics*, Vol. 17, 1955, *ibid.*

S. Leinhardt(ed.), *Social Networks*, Academic Press, Inc., N.Y. 1977.

C. Flament, *Applications of Graph Theory to Group Structure*, Prentice-Hall, Inc., Englewood Cliff, New Jersey, 1963.

R. J. Wilson & L. W. Beinekes(eds.), *Applications of Graph Theory*, Academic Press, London, 1979.

3. For this argument, see the papers in  
S. Leinhardt(ed.), *ibid.*  
C. Flament, *ibid.*
4. For the topological concepts introduced into psychology by Lewin, see,  
Kurt Lewin, *ibid.*  
F. Harary & Norman, *Graph Theory as A Mathematical Model in Social Science*, Ann Arbor, Michigan, : Institute for Social Research, 1953.
5. For this argument, see,  
Kurt Lewin, *ibid.*, Chapters II-IV.
6. For the fundamental topological concepts applied to psychology by Lewin, see,  
Kurt Lewin, *ibid.*, Chapter X.
7. According to Lewin, the degree of unity of a whole person depends on the relation of the parts of the whole and the whole to its environment. For the arguments on the process of differentiation and integration of psychological regions, see,  
Kurt Lewin, *ibid.*, pp. 182-187.
8. Kurt Lewin, *ibid.*, Chapter VI.

9. For the problem of mind/matter dualism, see,  
Colin Blakemore, *Mechanics of the Mind*, Cambridge University Press, Cambridge, 1977, Chapter 1.  
Also, a similar debate between mechanism and vitalism has been going on over centuries for the characterisation of life in biology. See,  
Ludwig Von Bertalanffy, *Problems of life*, Watts & Co., London, 1952, pp. 1-9.
10. Philip Steadman, *Architectural Morphology*, Pion Limited, London, 1983.
11. For Descartes, there is nothing else in material substance than homogeneous extension in length, breadth, depth and its diverse modes in shapes and motions. According to this metaphysical standpoint, the explanation of phenomena in nature is deduced from axiomatic principles based on general assumptions about extension but is not derived from the knowledge of particular events experienced. See,  
Pierre Duhem (Tr. by P. Wiener), *The Aim and Structure of Physical Theory*, Atheneum, N.Y., 1977(c/1954), pp. 13-18 & pp. 43-49.  
Ernst Cassirer, *The Philosophy of the Enlightenment*, Princeton University Press, Princeton, New Jersey, 1979(c/1951), pp. 50-55.
12. Descartes radically separates matter as extension from mind as thinking substance without any possible interaction between these so far as to regard animals as machines. See,  
E. Cassirer, *ibid.*, pp. 80-84.

Chapter 7. The Graph-Theoretic Representation of the Socio-Spatial Field of Communication

1. The convention of bubble diagram is adopted to represent conveniently the individual regions of space free of constraints from the shapes of space. See,  
R. E. Korf, 'A Shape Independent Theory of Space Allocation': in *Environment and Planning B*, Vol. 4, 1977.
2. Arnheim discusses the idea of space created by things, contrasting it with that of an empty entity which is supposed to precede the objects in it. In this conceptual framework, space is no more the homogeneous extension of emptiness but rather 'the field of forces' generated by the things present in

it. Here, the 'level of intensity' of this 'field of forces' is supposed to depend on perceptual factors so as to define the spatial organisation as a characteristic place. Gibson is said by Benedikt to have defined visual environment as the 'layout of surfaces' of objects which produce in unison the structure of light-borne information. Benedikt adopted this concept to his attempt to describing the visual environment as a field of light-borne information especially by developing the concept of the isovist field, or the field of path or location-specific patterns of visibility. This entails seeking a description of the environment which is exposed to an observer and releases information specific to the observer's position or path through it. For this argument, see,

Rudolf Arnheim, *The Dynamics of Architectural Form*, University of California, 1977, Chap. 1.

M. L. Benedikt, 'To take hold of space : Isovists and Isovists Fields' ; in *Environment and Planning B*, 1979, Vol. 6, pp. 47-65.

3. For this argument, see,

Taik-Gyu Kim, *A Study on the Structure of a Clan Village*, Iljogak, Seoul, Korea, 1979, pp. 309-318, (Korean Text).

## Chapter 8. The Topological Structure of the Socio-Spatial Field of Communication

1. See,

Stephen Jay Gould, 'Allometry and Size in Ontogeny and Phylogeny' : in *Ekistics* 215, Oct, 1973, pp. 253-262.

D'Arcy W. Thompson, *On Growth and Form*, Cambridge University Press, Cambridge, 1977(c/1917).

2. For this formula, see,

Oystein Ore, *Theory of Graphs*, (American Mathematical Society Colloquium Publications Vol. XXXVIII), American Mathematical Society, Providence, Rhode Island, 1967(c/1962).

Narsingh Deo, *Graph Theory with Applications to Engineering and Computer Science*, Prentice-Hall Inc., Englewood Cliffs, N.J., 1974, pp. 95-97.

In a planar graph, the maximum number of edge is  $E = 3V - 6$ . This follows from Euler's formula  $v - e + f = 2$ . If every face of a planar graph is a triangle, this graph contains the maximum number of faces and the ratio of  $f : e = 2 : 3$  since every edge must

belong to just two faces. Substituting  $f = \frac{2}{3}e$  in Euler's formula gives  $E = 3V - 6$ .

Also, for the basic concepts of graph theory adopted in this chapter, see,

F. Harary, Graph Theory, Addison-Wesley Publishing Co., Reading, Massachusetts, 1969.

F. Harary & E. Palmer, Graphic Enumeration, Academic Press, N.Y., 1973.

3. For the concept of the meridian system, see,  
Ilza Veith(Tr.), The Yellow Emperor's Classic of Internal Medicine, University of California Press, Berkeley, Los Angeles, London, 1972(c/1949).  
H. Woollerton & C. Mclean, Acupuncture Energy in Health and Diseases, Thorsons Publishers Ltd., Wellingborough, 1979.
4. For the mathematical concept of morphism and its related ideas of function and arrows of category theory, see,  
B. Mendelson, Introduction to Topology, Allen and Bacon, Inc., Boston, U.S.A., 1975(c/1962), pp. 11-25, pp. 107-110.  
S. MacLane, Categories for the Working Mathematician, Springer-Verlag, N.Y. & Berlin, 1971, pp. 1-30.  
M. Arbib & Manes, Arrows, Structures, and Functors, Academic Press, Inc., N.Y., 1975, pp. 1-30.
5. For basic concepts of statistics, see,  
Thomas H. Wonnacott & Ronald J. Wonnacott, Introductory Statistics, John Wiley & Sons, N.Y., 1977(c/1969).  
G. U. Yule & M. G. Kendall, An Introduction to the Theory of Statistics, Charles Griffin & Co. Ltd., London, 1965(c/1911).
6. For the analysis of social data and regression, see,  
Richard A. Zeller & Edward G. Carmines, Statistical Analysis of Social Data, Rand McNally College Publishing Company, Chicago, 1978.  
Frederick Mosteller & John W. Tukey, Data Analysis and Regression, Addison-Wesley Publishing Company, Reading, Massachusetts, 1977.
7. For basic concepts of sampling, see,  
L. Kish, Survey Sampling, John Wiley & Sons, N.Y., 1965.

Appendix M. Mathematical Notes

1. W. T. Tutte, *Connectivity in Graphs*, University of Toronto Press, 1966, pp. 1-16.
2. For the basic concept of category theory, see, S. MacLane, *Categories for the Working Mathematician*, Springer-Verlag, N.Y. & Berlin, 1971, pp. 1-30.
3. For the commutative diagram, epimorphism, and monomorphism, see, M. Arbib & E. Manes, *Arrows, Structures, and Functors*, Academic Press, Inc., N.Y., 1975, pp. 1-30.