

DEVELOPMENT OF SYMBOLIC PEDAGOGICAL TOOLS FOR COMMUNICATION IN ARCHITECTURE

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**BY
Abraham George**

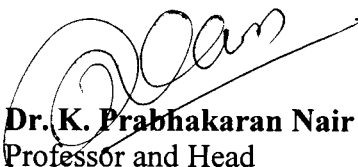


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May 2005

CERTIFICATE

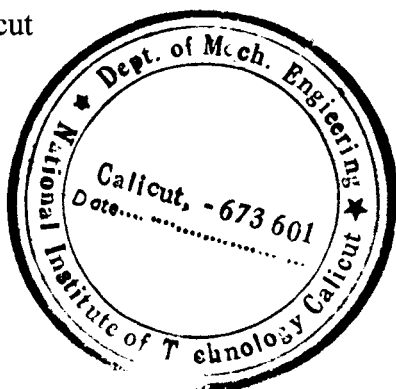
This is to certify that the thesis entitled "**Development of Symbolic Pedagogical Tools for Communication in Architecture**" submitted by **Abraham George** for the award of the degree of **Doctor of Philosophy** to the University of Calicut, is a bonafide work done by him in this department under the guidance and supervision of **Dr. K. Prabhakaran Nair**. The matter contained in the thesis has not been submitted elsewhere for any degree.



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*There is a time for everything,
and a season for every activity under heaven:....
..... a time to scatter stones and a time to gather them.....*

So too, is the case of this project of mine... Words carry deep meanings; still deeper are the feelings that spring from the well within. Yet, my heart is filled with gladness and I am overwhelmed with sheer joy in expressing my heart-felt thanks, not just once for all; but for all the times to come, to **Dr. K. Prabhakaran Nair** who is more a friend than a guide; *Guru par excellence*, for upholding me with his valuable guidance, counsels and encouragements throughout the development of this research project.

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A handwritten signature in black ink, appearing to read 'Abraham George', with a stylized circular flourish at the beginning.

May 12, 2005

Abraham George

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Ever since the pioneering works in semiotics, people around the globe are becoming increasingly aware of the potentials of symbols in communication. As proliferation in languages increased, even more increased the need to adjunct with sophisticated speech and to work a way back to the simple universality of an understandable, albeit limited symbology. Trends manifest indicate the evolution of multicultural global communities where people tend to form coherent groups constantly in communication with one another; be it verbally, nonverbally or even spatially. The art of architecture makes human existence not only visible but also meaningful by integrating form and space; synthesizing these into a spatial response, which is both functional and communicative. In this communicational process, symbols mean a lot; in perception, understanding and reinterpretation of the needs of a people for whom the designs are created.

Contribution of semiotics to architecture falls basically in the realm of elements of architecture that concerns the day-to-day life. On the contrary, the design education in architecture has to focus on both elements of architecture and spatial experiences which are relational to a great extent. The nature of these spatial experiences calls for a deeper understanding of its users' culture and context in its entirety in order to evoke effective signification by way of spatial response of the designer. Moreover, such effective architectural forms shall remain equally communicative and meaningful for trained designers as well as for the people

comprising a society. Symbols are promising in this regard since these are important elements of communication that capitalize on their power to represent, communicate and evoke user response. Recent global thinking had its ripples in architecture too and today's teacher of architecture has to teach and train heterogeneous receptors in contrast to the earlier educational systems, in an effort to impart learner empowerment. Studies conducted world over establish the need for mass education and empowering classroom communication, especially in architectural education. On its extreme, the teacher is baffled with problems of communication that arises in net-enabled '*e-classes*' where one has to decipher spatial experiences by way of existing means of communication in an almost platform independent manner. Though, this complex situation calls for a common means that communicates 'what is meant to be communicated' to any receptor group; no matter wherever they are, it seems to pose an almost insurmountable task. However, symbols promise a great deal in architectural education especially, in the learner-oriented, empowering process of education by generating better participation among students and teachers in imparting of knowledge through interactive learning rather than teaching. Moreover, since abstract symbols tend to de-contextualize images and invoke a thought process in the receptors, it opens up a way of thinking that is heraldic of meaningful architectural education and practice. Therefore, there is a need to develop a methodology for generating appropriate symbols in architectural education and a resource of symbols with high communicational efficiency. Further, the available multimedia tools are found to be inadequate, especially in meeting the goals of architectural education. Therefore, there exists a need to develop appropriate symbolic pedagogical tools for learner empowerment.

A methodology is developed for generating symbols through this research. It is simple enough to generate symbols with high communicational efficiency. Nature with its myriad manifestations is identified to be a dependable source of relatively 'bias-free' symbols. The development of symbols is made more or less designer-independent with the use of digital imaging and appropriate image editing software.

A set of twenty-one symbols are also generated to represent randomly selected words from the identified '*List of Words*' generated through an exhaustive survey. The generated symbols are validated through an extensive survey conducted among students of architecture. These symbols are judged to be equivalent to the words which they signify with an over all minimum score of 72%. Further, a designer-independent, standardized poster as a graphic tool for communication is developed. Twenty such posters are developed for classroom communication. The symbolic pedagogical tools would enable any worthy communicator in general and the teacher of architecture in particular, to decipher messages in a platform-independent manner. Moreover, the use of the developed symbols and posters would facilitate better student-teacher interaction and communication that would empower students and teachers of architecture in particular, to decipher messages in a platform-independent manner. In conclusion, the developed symbols and symbolic tools through this research would further the goals of teaching, learner empowerment and facilitate net-enabled education in the days to come.

1.0 INTRODUCTION

Graphic communication in its widest sense has a long history which traces its beginning to the early man, who hunted for food. Yet, it is only with the pioneering works in semiotics made by Henry Dreyfuss, Charles K. Bliss and Marie Neurath; people around the globe are increasingly made aware of the potentials of symbols in making communication to one another. Acceptance for the symbolic language first came from the travellers whose high speed demanded swiftly integrating solutions to traffic problem solving.[1-3] Though, the use of symbols to express ideas dates back age old; even to the cave communities, it proved almost inflexible and inadequate to express differences in degree, nuances in definitions or philosophical concepts. As proliferation in languages increased, even more increased the need to adjunct the sophisticated speech and work a way back to the simple universality of an understandable, albeit limited symbology. Through the developments in semiology over the years, symbols have multiplied to an alarming degree at par with the divergence in languages such that its diversity and multiplicity are a matter of immediate concern. On the contrary, the world becomes smaller due to the swifter modes of transport and telecommunication. Trends manifest indicate the evolution of multicultural, global communities where people tend to form coherent groups

constantly in communication with one another; be it verbally, nonverbally or even spatially; by way of built forms. Moreover, higher education systems in the contemporary world has to negate a number of disadvantages including the growing difference in learning habits, expectation of student groups that consist of a steadily rising number of women and children from working-class families and changing external pressures arising from the skilled manpower needs of a global society with its changing employment patterns.[4-6] This situation demands an easy and effective common means of communication in order to facilitate learner empowerment and living together in the today's Tower of Babel. In architectural education too, the need for an effective communication means imparting relevant knowledge is not much different especially in the light of growing heterogeneity of student groups. Moreover, learner empowerment has to be ensured in architectural education of contemporary times when a large number of architecture graduates turn to software and related jobs every year abandoning architectural practice.[5, 7]

Beyond the visual functions the elements of architecture, by way of their interrelationships to one another and the nature of their organization, also communicate 'notions of domain and place', 'entry and path of movement', 'hierarchy and order' which are presented as the literal, denotative meanings of form and space. The relationship that prevails need not necessarily have any reference to what is practical or descriptive but expresses a response of the designer's mind in establishing a language of Architecture. Architecture, starting from conditions more or less utilitarian establishes forms and relationships that arouse emotions in the users by employing materials. As in language, architectural forms and spaces also have

connotative meanings, associative values and symbolic content that are subject to personal interpretation, which can change with culture, context; even as depicted in the Kandyan landscapes or the Mughal landscapes.[8-10] The spires of a Gothic cathedral signify the realm, values and goals of Christianity. So too, the Greek column conveys the notions of democracy and the 'yin' that alternates with 'yang' effectively signifies the 'Tao way to exist with nature and fellow beings'.[8] Thus, in all architectural expressions of cultures around the world, be it the landscapes of the Mughal, or the built forms of pragmatic societies design; combining of form and space into a single essence, not only facilitates function but also communicates the 'structure and meaning' that are central to the constitution of the respective society.[10-13] Thus, the art of architecture makes human existence not only visible but also meaningful. Therefore, it is imperative to acknowledge the elemental quality of architecture as shelter and symbol; buildable and usable, a shelter that is meaningful as a setting for living and an instructional space encoded with spatial messages. Shelter and symbolism which are inevitable, admitted and explicit elements of an architecture that embraces sign, reference, representation, iconography, scenography and trompe-l'oeil as its valid dimensions, makes manifest evocation, for these elements are the genesis and basis of the art of architecture.[14]

Though semiotics has given its contribution to architecture, these consist basically of architectural elements that concern common use of day-to-day life. It is quite natural since such developments are primarily intended to facilitate the use of built environments. Signage in built environment has more of an impact on people with visual disability who constitute the largest group of disabled people, enabling

them to navigate in built environments.[15] On the other hand, design education in architecture has to focus on both elements of architecture and spatial experiences that result from built environments since these are equally important in the perception and understanding of built forms that leads to spatial experiences. The relational nature of spatial experiences calls for a deeper understanding of the users and their culture in order to interpret and generate the intended meaning in built forms by way of symbols that signify such relationships to the best understanding of the users. Design education in architecture intends to develop interpretational skills, facilitated by symbolism in its prospective students. Moreover, the contemporary heterogeneous student-groups pose a complex problem of communication which demands increased interaction and participation among them, so as to result in learner empowerment. Use of effective symbols will empower designers in the practice of architecture; to understand and transform user's needs to communicative spaces that offer a sense of relevance through embedded meanings. Moreover, symbols are important elements of communication that capitalize on their power to represent, communicate and evoke user response.[16, 17]

Recent global thinking has its ripples in architecture too and today's teacher of architecture has to teach and train heterogeneous receptors in various groups in contrast to the earlier educational systems.[4, 18, 19] Studies conducted world over establish the need for mass education and empowering classroom communication, especially in architectural education.[5, 6, 20] Students of architecture normally hail from varied backgrounds of culture, exposure and have differing levels of intellect imparting heterogeneity to the receptor group.[4, 19, 21] When such heterogeneity

prevails it is often difficult to communicate what needs to be communicated to the receptors. The problems of communication are further worsened with the degree of heterogeneity that exists in the receptor group which is also closely linked with the level of exposure of the receptors. On its extreme, the teacher of architecture is baffled with the problems of communication that arises in net-enabled 'e-classes' where spatial experiences have to be deciphered by way of the existing means of communication in an almost platform-independent manner. Though, this complex situation calls for an appropriate language that communicates what is "meant to be communicated" to any receptor group, no matter wherever they are, it seems to pose an almost insurmountable task. However, symbols promise a great deal in architectural education especially in the learner-oriented, empowering process of education by generating better participation among students and teachers in imparting knowledge through interactive learning rather than simple lecturing. Moreover, since abstract symbols tend to de-contextualize image and invokes a thought process in the receptors, it opens up a way of thinking that is heraldic of meaningful architectural education and practice.[3, 22, 23]

1.1 THE NEED

DISCUSSION ON THE RESULTS OF SURVEY 01 AND 02

Extensive questionnaire surveys were conducted among students of *Bachelor of Architecture Programmes* in India, to bring out the problems existing in communicating architecture in classrooms.(Annexure 04-A,B) The results of the survey conclusively establish that there exist problems of communication in architectural education; especially in classrooms. 50% of the surveyed students recorded that they

face problems of communication in classrooms.(Table 1.1)(Annexure 1.A) It is alarming to note that only 28% of students resorted to verification means such as ‘peer discussions’ and ‘teacher consultation’ for verification and clarification of doubts. The lower levels of ‘learner interaction’ are quite evident from the large number; 78% of students resort to ‘consultation of books’ and other means in verification of what is lectured. This astounding result calls for immediate attention and demands the development of a better means of communication for enhanced learner interaction and empowerment. A vast majority of students; 97%, agreed that since the words used in architectural communication are ‘relational’, use of graphics and symbols would be of immense help in making the messages clearer. Moreover, 93% agreed that symbols and posters with symbols would enhance classroom communication. Their responses stand verified with the relatively lower communicational problems in Math; 33%, since such lectures heavily depend on an appropriate symbolic language. Further, the results of Survey 02 establish the existence of communicational problems to the tune of 34% even in architectural studio discussions, where discussions generally happen at personal levels.(Table 1.6)(Annexure 1.B) Thus, the analysis of the results Survey 01 and 02 conclusively establishes the need for a symbolic means of communication since a symbol-assisted communicational means would obviously enhance learner interaction resulting in learner empowerment. Therefore, there exists a need to develop a methodology for generating appropriate symbols for architectural education and a resource bank of symbols with high communicational efficiency. Further, since the available multimedia tools are found to be inadequate especially in meeting the goals of architectural education, there is a need to develop appropriate symbolic pedagogical tools for learner empowerment.

Table 1.1 Consolidated Statement of Responses: Survey 01

Qn. No.	Question	Cumulative Responses		CET Trivandrum		COE Trichur		NIT Calicut		MES Kuttippuram		RIZVI Bombay	
		Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists
1, 2	Problem in understanding Classroom lectures?	99	50%	42	47%	19	56%	22	55%	11	45.8%	5	38.5%
3 a	Means of verification of lectures? - Consult teacher	44	22%	14	16%	8	24%	11	28%	9	37.5%	2	15.4%
3 b	Consult peers	12	6%	3	3%	2	6%	6	15%	0	0.0%	1	7.7%
3 c	Other means	147	74%	72	81%	24	71%	26	65%	15	62.5%	10	76.9%

4, 6	Does illustration, Symbol assisted lectures helps?	194	97%	88	99%	33	97%	36	90%	24	100%	13	100%
5	Problem in understanding Math / Engg lectures?	65	33%	28	31%	12	35%	14	35%	8	33.3%	3	23.1%
7a	Nature of terms used in architecture - Subjective?	153	77%	71	80%	19	56%	31	78%	20	83.3%	12	92.3%
7b	Nature of terms used in architecture - Relational?	168	84%	75	84%	22	65%	36	90%	22	91.7%	13	100%
8	Do Symbols and posters with symbols would improve classroom communication?	186	93%	87	98%	27	79%	39	98%	20	83.3%	13	100%
Total No. of respondents		200		89		34		40		24		13	

Table 1.2 Statement of Responses (South Zone; Kerala) - Survey 01

Qn. No	Question	CET - F4		CET - F3		CET - S4		CET - S1S2		CUMULATIVE RESPONSES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	9	50.0%	4	40.0%	16	55.2%	13	40.6%	42	47%
3 a	Means of verification of lectures? - Consult teacher	2	11.1%	0	0.0%	6	20.7%	6	18.8%	14	16%
3 b	Consult peers	0	0.0%	0	0.0%	2	6.9%	1	3.1%	3	3%
3 c	Other means	16	88.9%	10	100.0%	21	72.4%	25	78.1%	72	81%
4 and 6	Does illustration, Symbol assisted lectures helps?	18	100.0%	10	100.0%	28	96.6%	32	100.0%	88	99%
5	Problem in understanding Math / Engg lectures?	7	38.9%	3	30.0%	11	37.9%	7	21.9%	28	31%
7 a	Nature of terms used in architecture - Subjective?	15	83.3%	10	100.0%	21	72.4%	25	78.1%	71	80%
7 b	Nature of terms used in architecture - Relational?	14	77.8%	7	70.0%	27	93.1%	27	84.4%	75	84%
8	Do Symbols and posters with symbols would improve classroom communication?	17	94.4%	10	100.0%	29	100.0%	31	96.9%	87	98%
	No. of respondents	18		10		29		32		89	

Table 1.3 Statement of Responses (North Zone; Kerala) - Survey 01

Qn. No	Question	MES - S1S2		COE - F4 TRICHUR		COE - F5 TRICHUR		CUMULATIVE RESPONSES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	11	45.8%	11	57.9%	8	53.3%	30	52%
3 a	Means of verification of lectures? - Consult teacher	9	37.5%	6	31.6%	2	13.3%	17	29%
3 b	Consult peers	0	0.0%	1	5.3%	1	6.7%	2	3%
3c	Other means	15	62.5%	12	63.2%	12	80.0%	39	67%
4 and 6	Does illustration, Symbol assisted lectures helps?	24	100.0%	19	100.0%	14	93.3%	57	98%
5	Problem in understanding Math / Engg lectures?	8	33.3%	6	31.6%	6	40.0%	20	34%
7	Nature of terms used in architecture - Subjective?	20	83.3%	9	47.4%	10	66.7%	39	67%
7b	Nature of terms used in architecture - Relational?	22	91.7%	13	68.4%	9	60.0%	44	76%
8	Do Symbols and posters with symbols would improve classroom communication?	20	83.3%	14	73.7%	13	86.7%	47	81%
	No. of respondents	24		19		15		58	

Table 1.4 Statement of Responses (Kerala State) - Survey 01

Qn. No	Question	CET- Total		Trichur COE -Total		MES - SIS2		Cumulative response	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	42	47%	19	56%	11	45.8%	72	49%
3	Means of verification of lectures? - Consult teacher	14	16%	8	24%	9	37.5%	31	21%
	Consult peers	3	3%	2	6%	0	0.0%	5	3%
	Other means	72	81%	24	71%	15	62.5%	111	76%
4 and 6	Does illustration, Symbol assisted lectures helps?	88	99%	33	97%	24	100.0%	145	99%
5	Problem in understanding Math / Engg lectures?	28	31%	12	35%	8	33.3%	48	33%
7a	Nature of terms used in architecture - Subjective?	71	80%	19	56%	20	83.3%	110	75%
7b	Nature of terms used in architecture - Relational?	75	84%	22	65%	22	91.7%	119	81%
8	Do Symbols and posters with symbols would improve classroom communication?	87	98%	27	79%	20	83.3%	134	91%
	No. of respondents	89		34		24		147	100%

Table 1.5 Statement of Responses (Mixed Zones; All India) - Survey 01

Qn. No	Question	NITC - S10		NITC - S6		NITC - FIRST THESES		RIZVI - S3		CUMULATIVE RESPONSES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	9	50.0%	7	50.0%	6	75.0%	5	38.5%	27	51%
3 a	Means of verification of lectures? - Consult teacher	5	27.8%	2	14.3%	4	50.0%	2	15.4%	13	25%
3 b	Consult peers	1	5.6%	1	7.1%	4	50.0%	1	7.7%	7	13%
3 c	Other means	12	66.7%	11	78.6%	3	37.5%	10	76.9%	36	68%
4 and 6	Does illustration, Symbol assisted lectures helps?	16	88.9%	12	85.7%	8	100.0%	13	100.0%	49	92%
5	Problem in understanding Math / Engg lectures?	5	33.3%	6	42.9%	3	37.5%	3	23.1%	17	32%
7	Nature of terms used in architecture - Subjective?	15	83.3%	8	57.1%	8	100.0%	12	92.3%	43	81%
7b	Nature of terms used in architecture - Relational?	16	88.9%	14	100.0%	6	75.0%	13	100.0%	49	92%
8	Do Symbols and posters with symbols would improve classroom communication?	18	100.0%	13	92.9%	8	100.0%	13	100.0%	52	98%
	No. of respondents	18		14		8		13		53	

Table 1.6 Consolidated Statement of Responses: Survey 02

Qn. No.	Question	Cumulative Responses		CET Trivandrum		COE Trichur		NIT Calicut		MES Kuttippuram		RIZVI Bombay	
		Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists	Yes	Problem of Communication Exists
1, 2	Problem in understanding design discussions	72	34%	32	36%	14	41%	15	29%	8	33.3%	3	23.1%
No. of respondents		211		89		34		51		24		13	

Table1.7 Statement of Responses (South Zone; Kerala) - Survey 02

Qn. No	Question	CET - F4		CET - F3		CET - S4		CET - S1S2		CUMULATIVE RESPONSES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	7	38.9%	3	30.0%	12	41.4%	10	31.3%	32	36%
	No. of respondents	18		10		29		32		89	

Table1.8 Statement of Responses (North Zone; Kerala) – Survey 02

Qn. No	Question	MES - S1S2		COE - F4 TRICHUR		COE - F5 TRICHUR		CUMULATIVE RESPONSES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	8	33.3%	9	47.4%	5	33.3%	22	38%
	No. of respondents	24		19		15		58	

Table1.9 Statement of responses (Kerala State) - Survey 02

Qn. No	Question	CET- Total		Trichur COE-Total		MES - SIS2		CUMULATIVE RESPONSE	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	32	36%	14	41%	8	33.3%	54	37%
	No. of respondents	89		34		24		147	

Table 1.10 Statement of Responses (Mixed Students; All India) – Survey 02

Qn. No	Question	NITC - S10		NITC - S6		NITC - S4 B. Arch		RIZVI - S3		CUMULATIVE RESPONSES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	7	38.9%	4	28.6%	2	11%	3	23.1%	18	28%
	No. of respondents	18		14		19		13		64	

This research therefore, is conceived to pursue symbols and symbolism in architecture and its effective application in architectural education so that communication in architecture is effected even to a heterogeneous receptor group.

1.2 OBJECTIVES

- To study the developments in graphic representations, symbolism in architecture and source of symbols in communication.
- To study the problems of communicating architecture to heterogeneous receptor group of students.
- To develop an appropriate method to generate symbols that are graphic equivalents signifying words in the identified vocabulary of architecture.
- To develop graphic equivalents, criteria and guidelines for effective signification by such developed graphic equivalents and an appropriate symbolic pedagogical tool for communication in Architecture.

1.3 SYMBOLS AND SIGN DESIGN

Symbols are key elements of communication capitalizing on their power to communicate and it generally demands the expertise of well-trained graphic designers for its making. The term 'symbol' includes pictograms, which is a representation of an object, although the words 'pictogram' and 'symbol' originally had quite different meanings. Moreover, over the period of time people have used the word symbol in wider perspectives which adds further complexity and lack of specificity to it. Therefore, to avoid the cultural bias and the 'lack of specificity' attached to any

symbol; it is defined; for the purpose of this research, as a communicative ‘graphic equivalent’ that signifies an identified word, element or theme.

Symbols fall into two basic categories; *representational and abstract*. [2, 3, 24] While representational symbols do relate directly to the objects represented, abstract symbols such as letters, numerals and signs do not have any direct visual correspondence with the objects or concepts they represent but communicate an idea. (Figure 1.1) Although it is easier for most people in a given culture to understand representational symbols, their meanings must be learned which require thinking by the receptors.



Figure 1.1 ***Representational symbols and abstract symbols***
The communication power of symbols depends on the degree of correspondence or signification.

Symbols in the broader purview are primarily used for directional signs or as identificational signs. They are commonly used in transportation facilities, public buildings and for international events such as Olympic Games which require information to be conveyed to heterogeneous receptors hailing from various cultures. Earlier an international language of symbols was suggested in the hope of solving the fundamental problems of communication. However, symbols have not yet proved to be a panacea for all the communicational problems. Although a number of conventions are understood internationally, a standard set or system of international

symbols is yet to be developed. Moreover, there exists a lot of duplication resulting in confusion. There exist many symbol systems and no one system has been adopted for use in all countries due to their inherent deficiencies. Graphic designers have adopted the 1974 US Department of Transportation symbols coordinated by the American Institute of Graphic Arts, (AIGA). Yet, not even in the United States these symbols have been successfully implemented on the federal highways.[25] Though, the design and implementation of an international symbolic language appears to be a difficult task; yet to be accomplished, there is an essential need for research into symbols and symbolic pedagogical tools for effective communication, especially in situations where speed of recognition by heterogeneous receptors facilitates understanding and empowerment as in the contemporary mass education scenario.[4-6, 20]

1.3.1 Problems posed in design

The design of systems of signs using symbols is a relatively recent idea. Therefore, people often initially find difficulty with the concept itself. Since designers always make design decisions based on their own experiences and are prone to making ‘incorrect assumptions’ about the users, the symbols created by the designers also could fall beyond the cognizance and understanding by its users. Moreover, designers can neither assume universality for symbols as communicative elements, nor presume any symbol to be widely understood equally well in all cultures as Margaret Mead, an anthropologist exhorts;

the “skull and crossbones” does not mean poison, nor does “red” connote danger, to all people around the globe.[1]

Though it is thought that symbols are more effective when accompanied by words, it is also argued to defeat not only the purpose but also to neglect the multilingual considerations that can result in design problems. However, in posters, the use of appropriate words have functioned well in communicating to heterogeneous receptors.[3] The graphic designer needs to consider which language to be used and how to communicate the idea incorporating words along with symbols. The effectiveness of these graphic equivalents could further be improved, if they are particularly used as part of a coherent symbolic system; as a graphic tool, in signifying objects, words or even ideas and concepts.[9, 26, 27]

Symbols are essentially fun and they add interest if used in any communication; be it teaching and learning or in design, even as elements of colour and patterns. Moreover, they may be used to classify, categorize, unify objects and settings and amplify nuances enabling effective way finding; a term used to describe the process of reaching a destination.[16, 24, 28-31] When dealing with several symbols the designer must maintain close correspondence and signification at the same time establish visual consistency and coherence. The development of even one symbol therefore, is a challenging task even for an experienced graphic designer. Even more challenging is the task of designing a symbolic tool for communication in a coherent system especially to address a multicultural, heterogeneous receptor group.

1.4 LIMITATIONS OF THE PRESENT SYSTEM

Symbols used for communication in architecture pertain basically to the elements of common use like stairs, exits, fixtures or the like; mostly nouns, that helps

in way finding. Since these are abstract symbols that are intended to represent the select objects, without additional layering of meaning, they are found grossly inadequate and inflexible in the communication of relational messages, themes and complex messages in architecture. On the other hand relational messages, themes and concepts concerning spatial experiences are indispensable in architectural education. Although, pioneering attempts are made to communicate graphically emotions, expressions, gestures, conventions of body posture and distances which are critical in expressing personal opinions and in moderating social relationships in a limited manner over the Net, by using smileys or emoticons that are combinations of keyboard characters, there remains an even greater task of designing graphical equivalents and graphical tools for communication in architecture.[1, 32](Figure 1.2)

- :-) Pleasure, humour, etc
- :-(Sadness, dissatisfaction, etc
- ;-) Winking (in any of its meanings)

Figure 1.2 *Examples of basic Smileys* [1]

Though efforts are made to free symbols from cultural bias, to a great extent, symbols used in architecture are not platform-independent which is true especially when comes to color.[29, 30, 33-35] Further, platform-dependence reduces the effectiveness of symbols when used elsewhere, other than its relevant context.

1.5 ADVANTAGES OF THE PROPOSED SYSTEM

Symbols are effective in deciphering messages quickly along with its associated meanings harnessing their ability to signify the signified and their ability to

be understood on multiple levels.[16, 26] Higher degree of significancy could be attained through similarity of form, shape or colour and by additional layering of meaning. Though, religious symbols constituted by its respective symbolism carries in its composition all the meanings that are assigned by man over the ages, the problem of right interpretation could be achieved by taking into account the most general significance: the sole significance which can relate all the particular significances one to another, the sole significance which permits us to understand how all these last ended by forming a single structure.[26] Nature poses a potential source to derive symbols from that rise above the confines of religious significance and individual bias. The more such symbols are made platform-independent, better will be their significancy with which messages are deciphered resulting in quicker and deeper understanding by the receptors.

Through this research it is intended to develop appropriate graphic equivalents that are termed 'symbols' and symbolic tools using such graphic equivalents that are effective in communicating architectural elements and relational messages concerning spatial experiences. A methodology for the development of symbols and symbolic tools is outlined in Figure 1.3. The graphic equivalents would therefore, provide a means for effective communication in the contemporary higher education scenario that is becoming increasingly multicultural in nature. A graphic tool intended to be developed, would integrate the developed graphic equivalents in a more or less standardized format, with meaning layered through its organization and colours, would facilitate easy deciphering of meaning to heterogeneous receptors. Further, effective communication improves learner-participation that leads to effective

interaction and learner-empowerment which imparts in value enhancement in the products of universities.[4, 5]

Effective networks and partnerships among architectural institutions that employ symbolic pedagogical tools would foster research and development in architectural pedagogy. Moreover, since symbolic communication imparts deeper understanding in learners especially through the increased participation and interaction, it would open up a novel way of thinking facilitating the generation of meaningful communicative forms in Architecture. So too, the developed graphic equivalents and symbolic pedagogical tools would enable communication in today's *Net-enabled* classrooms resulting in learner empowerment at reduced costs coupled with the freedom of being in one's own comfortable settings.

1.6 METHODOLOGY AND ORGANIZATION OF ACTIVITIES

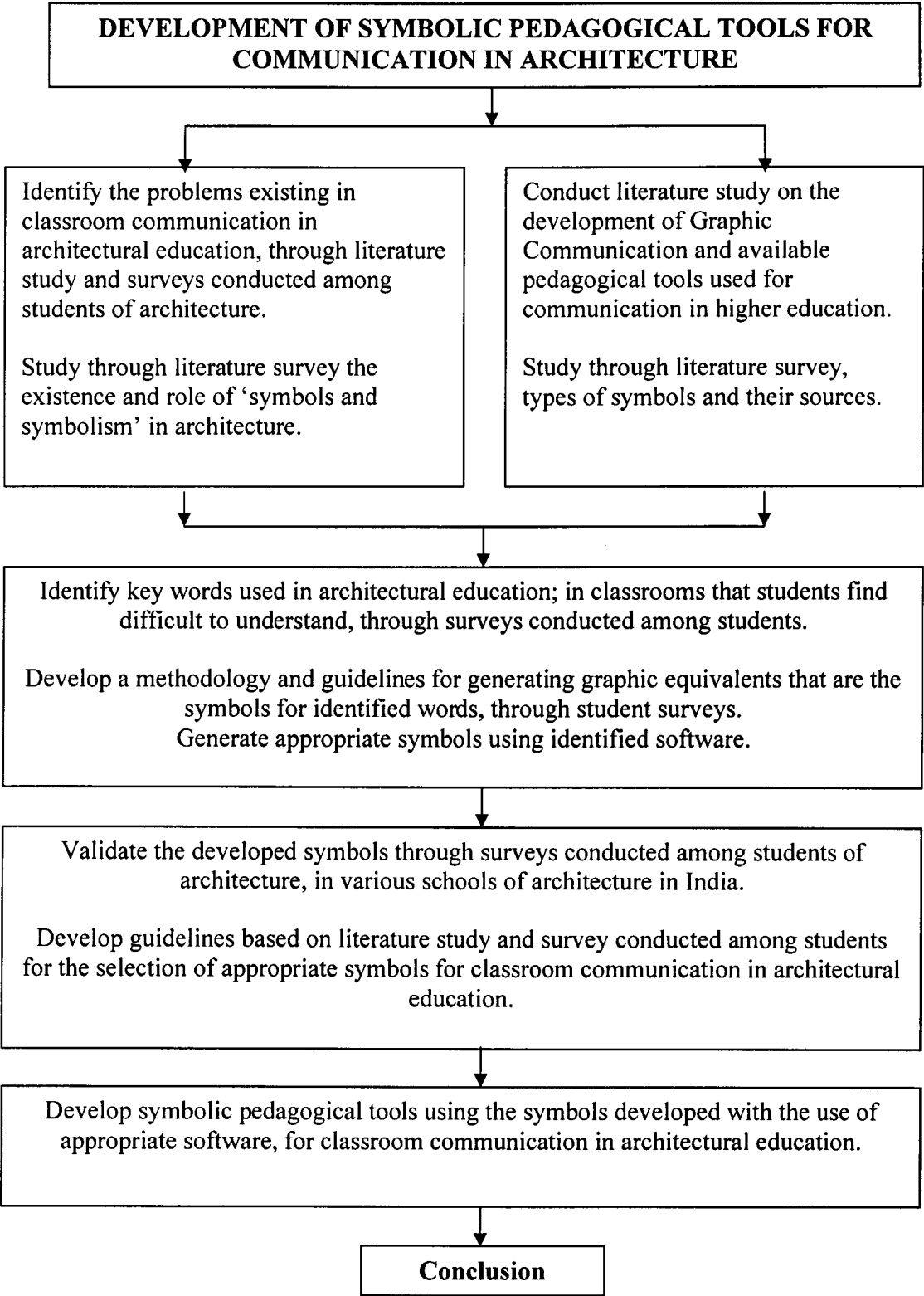


Figure 1.3 Methodology

2.0 STUDY OF ARCHITECTURAL SYMBOLISM

Humans, owing to their communicating nature, decipher and deduct meaning from all that they do and see or experience in their everyday life. As people express their spatial needs in physical settings, they also communicate spatially for it is a truism that architecture communicates by directing the knowledge and ideas that works behind its genesis.[36] The mental images created in the receptors; as in any other form of communication, enables them to derive meaning for them. Moreover, the user of such built forms learns through his personal experiences, the knowledge encoded in its organization and forms. In a way, people live not by the things that they see or the spaces that they live in, but by the meaning that they deduct out of such.[37] Since meaning is deduced out of the association that graphics possess with the object symbolized; *a tension between the symbol and the signified*, it is important to understand how such associations are formed. From time immemorial people in all cultures have sensibly symbolized such associations by way of their chosen graphics and forms. Thus, symbolisms that people have developed throughout the world are simplified abstractions of complex realities, where the power of the visible is the signified invisible.[38] Moreover, symbols being abstractions provide a simpler yet powerful means of signifying what one wants to communicate; even spatially, to the

watching world. Therefore, understanding symbols and symbolism that is inseparable of any culture holds the key to understand and interpret these. It is only when such interpretations are facilitated that the designer could create meaningful architecture that is of any contemporary relevance. Therefore, training the students to perceive and interpret symbols is quite relevant in architectural education.

2.1 SYMBOLISM AS MANIFESTED IN RELIGIONS

Religion is a unified system of beliefs and practices related to sacred things, set apart and forbidden, which unite its people into one single moral community. It is also an expression of the human desire to communicate with God, their Creator.[35, 39, 40] Studies have established that man possesses a natural worshiping nature. Moreover, man being *homo symbolicus* and all his activities implies symbolism; every religious fact has necessarily a symbolic character. Every religious act from the moment it becomes religious, is coded with a significance which in the final instance is symbolic, since it refers to invisible supernatural. Further, religious symbols have an existential value; for it always points to a reality or a situation concerning human existence, which distinguishes symbols from concepts.[26] God is the image of man's ultimate holy desires and an embodiment of the unattainable. Man desires to see that which is invisible to have a proof of what he believes and is taken to substitute the sign for the invisible reality. Words often fail in such intimate, ecstatic spiritual communications, where symbolism succeeds. Symbolism often makes spiritual matters easy to grasp and imparts deeper understanding by signifying the unknown through graphical images of what is known; by way of symbols and metaphors. Symbols possess the power to integrate as well as disintegrate individual, family or

society by way of classification just as '*totem*' does as a regulatory symbol by serving its sociological role in a society that is largely defined by mysterious, cosmic orders and beliefs that fashion their societal expressions.[41] Moreover, symbolism imparts certain beauty by way of mysticism to religion in speaking of an unseen world to be received by faith. Humanity throughout history used precious and long-lasting materials to erect magnificent structures not to live in, but to worship their gods for it is within these places for spiritual contemplation that one experiences the most profound life-experiences.[42] Symbols and symbolism thus, facilitate such splendid spatial and spiritual experiences for its receptors as manifested in Christianity, Hinduism, Islam or Buddhism.

2.1.1 Christianity

Christianity like all other religious representations has manifestations of collective consciousness that successfully express their cultural constructs and realities. Even the contemporary church in all its cultural expressions displays all the characteristics of primitive religious realities almost in strict adherence to Durkheim's theory and the symbolic totemic expressions could be identified in their practices that unite its members as a church within a set of doctrines and dogmas, which are performed within meaningful, spatial expressions; their churches or meeting houses.[39, 43] Christian symbolism like musical notations illustrates the signified, which is evident in the use of signs and symbols adopted to manifest and instruct spiritual truths to the 'faithful' and others alike. Church buildings essentially symbolize the Ark of the Most High God as in the case of puritan meeting house; '*Old Ship House*'. [42, 44] The Nave, Chancel and Sanctuary respectively signify the

'Church Militant, the Church Expectant and the Church Triumphant' or *'Earth, Purgatory and Heaven'*. Cross symbolically represents the mode of the Lord's death and is accepted as the symbol of supreme sacrifice and the shape of true Cross; the 'T' cross with its lower arm longer than the others, is probably Latin. However for Churches, essentially the 'cruciform plan' remains to be the most favored design in Christendom.[2]

2.1.2 Hinduism

The rich heritage and beliefs of Hinduism have a perfected art of symbolism of unraveled ideals signified in crafted idols. Idol worship with the superfluous rituals has great religious and philosophical significance embodied in it. The values, norms and structures that constitute their cultural systems, are passed on to generations by their forefathers; even continues to mould their cultural expressions. Transfer of their societal systems and values are achieved through religious rituals by enacting and reenacting. In the absence of personal experiential knowledge for an individual, the symbol becomes a mere mark of identity with lost meaning.[39] Hinduism is highly individualistic and Hindus love the freedom to worship their personal choice of an icon to visualize the abstract '*Brahman*'. It is therefore crafted in an abstract idol or an appropriate symbol, that is comprehensible for the worshiper and it remains meaningful in perfect significance with the cosmological concepts.[26] Hindu temples are located on higher altitudes in order to symbolize the dominance of spirituality over the worldly life. Temple also portrays the cosmic god by epitomizing it in physical form with various parts of its body intended to signify the religious concepts

whereby it serves as a signifying graphic expression representing relationships between '*human and divine*' or '*material and spiritual*'. [24, 29, 45]

2.1.3 Islam

When Islam arrived in India through Arab traders, its architecture did not differ much due to the strong material and technological peak existed here at that time.[46] Yet, the meaning ascribed to the forms did change in tune with Islamic culture. Thus even where forms largely remained unaltered their symbolic identities are modified to match with the culture of users proving that over and above functionalism the symbolism determines acceptable architecture.[35, 47] Wherever possible, destruction of high-impact symbols of the invaded culture is observed; be it in architecture of built forms or other wise. In every case where the culture of the invader was stronger and more intolerant, destruction in total of the invaded culture with all its symbols is evidenced. Such actions as these of conquest further establish the dire need to 'suppress and subjugate' the conquered and to 'make them accept the supremacy' of the conqueror, proves that symbols and its associated meanings as manifested in every culture and architecture effectively communicated what these are meant to communicate; even beyond the limits of time and context.

2.1.4 Buddhism and Symbolism of Mandala

Perhaps the most admired symbol of Buddhist religion is '*Mandalas*' which is the symbol of the universe with its energy and it induces a cyclic thought process in its followers through the cycle of life and death.[8] Each object in Mandala has significance and represents some aspect of wisdom. The origin of the Mandala is the

center, a dot free of dimensions. It means a '*seed*', or '*sperm*'; the starting point. In its geometry, the Mandala is a spiritual wheel of many spokes, each intersecting with the center and representing that of the universe.[9]

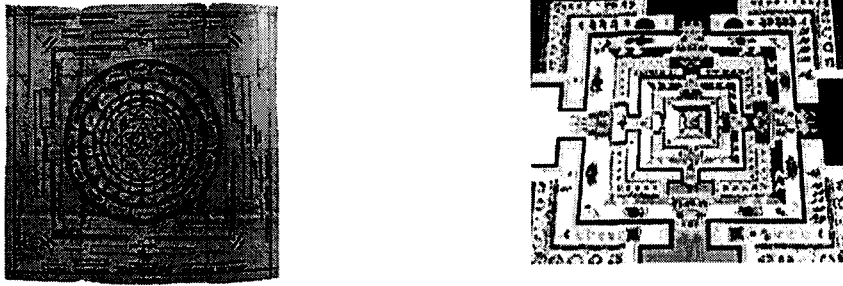


Figure 2.1 *Mandalas*

The axis of the Mandala is the symbolic line of communication; 'a line that materializes out of a dot', between god and man.(Figure 2.1) Circle drawn around symbolizes 'dynamic-consciousness' of the initiated. The outlying square symbolizes the physical world bound in four directions, represented by four gates. The deity occupies the midmost area. The quadrants of Mandala are typically divided into isosceles triangles of colours, four of the following five: white, yellow, red, green and dark blue; each of which is associated with one of the five transcendental Buddha; further with the five delusions of human nature. Thus, the symbolic character of cultural productions of the Buddhists signifies all of the activities of their mind; even myths, art and architecture through their innate symbol forming power.[26]

2.2 ARCHITECTURAL SYMBOLISM FOR SPATIAL COMMUNICATION

Architecture is not simply the 'design of buildings' that are mere physical enclosures. On the contrary, it is an expression of thoughts, preferences, beliefs and

emotions in built form, symbolically communicating and imparting relevance to its users. Serious architecture has a strong moral and social core that has a robe of the manifested; the form with all its attributes. Therefore, the houses and landscapes in which we dwell affect us emotionally, psychologically, physically or the wellbeing in total. The art of architecture is foremost concerned with the form and further, delimiting and articulating spaces. Though any house occupies space, it will be transformed to a place regardless of time if only it is occupied. Its visual appeal concerns the overall form, color, lines, shapes, and texture. Color accentuates its form and the attributes of the materials from which it is made. Rooms, which are shaped differently and built with different materials, manifest different spatial qualities; those have varying associations and meanings. Meaning mostly springs from a religious base or the context where their experiences are moulded. So too, the external forms of architecture with its features communicate beliefs, culture and its constructs which are of the collective consciousness from which an individual draws.[39] It is such symbolism of associated meanings that is present in the consciousness of a person that prompts him to choose by own preferences. A survey conducted in this regard among a group of retired personalities clearly establishes the symbolism that is inseparable of their culture through their preferences.[47] Since Architecture is spatial communication, it is all about how effectively the designer can induce definite meanings in its users through effective signifiers; be it forms, patterns or any graphical equivalents. A review of history of architecture establishes that 'instilling meaning' can be effectively achieved by way of architectural symbolism.[40] Architecture of any place can transform it to such an extent that by carefully incorporating symbolism the designer can make its users feel nostalgic, romantic or

even take them up to exalted spiritual levels. Symbolic built forms by themselves are signifiers and contexts of negotiation or resolution of complex cultural differences. Hence, these pose a potential '*symbolic bridge*' between cultures that are at variance and in conflict in a world of intolerance.

2.2.1 Symbolism of Stonehenge



Figure 2.2 *Stonehenge*

Architecture has originated in the religious impulse and it always remains symbolic. Stonehenge; one of the earliest permanent constructions, consist of huge stones roughly shaped and arranged in lines or circles as seen at Stonehenge in England. The stones were set up by several successive peoples inhabited the region between 3000 and 1600 BC.(Figure 2.2) They are grouped in four concentric circles, two of which are formed by paired uprights bearing huge capstones. Because they are arranged to align with the sun at the summer and winter solstices, it is generally assumed to serve as a symbolic monumental calendar in which rites were performed on significant days of the year.[15]

2.2.2 Symbolism of Pyramids and Obelisks

The Egyptian pyramids are far more sophisticated and larger in size compared to the *Stonehenge*; yet are similar in the embodied symbolism. These colossal

pyramids symbolically represent the sacred stones. Egyptians worshipped the sun god often represented by a symbolic pyramidal stone; *ben-ben*. The Egyptian *Hieroglyph* for the sun is a triangle divided horizontally into three zones; red, white and yellow. The huge *ben-bens* seem to signify the sun god with the top yellow zone spreading its rays upon the earth with the bottom red zone. It has been conclusively established that the pyramids are symbolic *ben-bens*; the abstract symbol of sun with its rays reaching down to earth. Egyptians who believed in “*life after death*” also believed that when *Pharaoh* dies, he would ascend in sun's rays to join his father, the sun god. Thus pyramid also symbolizes a staircase used by *Pharaoh* to ascend heaven.[48]

Obelisks, on the other hand, are often used to signify power and achievement, since these monumental vertical stone pillars defy gravity. An interesting case of symbolic communication is generated as the Pope attempted to signify the triumph of the church by translocation of the obelisks to Rome and capping it with *Cross*.

2.2.3 Symbolism of Stupa

Indus Valley marked the evolution of the *Hindu* culture that created a characteristic temple form; the *Stupa* that symbolizes *sacred mountain*. Stupa, an ovoid mass of stone blocks became taller over the passage of time.[49] The deity was placed deep inside a small, unlit womb chamber at its core, below its peak. The idol was originally placed in *rock-cut caves*, deep inside cliffs. Many centuries later, the Hindu temple emerged out it as a freestanding structure symbolizing the mountain in which the deity was formerly contained.[49]

2.3 TRENDS IN MODERN ARCHITECTURE

The movements that defined the spirit of twentieth century design and modern architecture were founded on the principles of eliminating any 'symbolic significance' and 'culture specificity' associated with the symbols of any given culture, 'pure forms' created through the understanding of structural principles, 'technical feasibility' for mass production and the requirements of the industrial society born in the later half of the Nineteenth Century. Modernism ultimately produced a corporate image consisting of glass box and desensitization for the human scale and form. The glass box, the white box and other architectural elements that comprise the various movements of modern architecture thus belong to the era of the Industrial society. Twentieth century has witnessed the advent of many ideologies that professed to solve all social and economic problems through architectural solutions.[50] Modern; as a style or characteristic design was never associated with any one particular style for too long. With the many movements that characterized the progress of the new century only the International style emerged as the culminating style of the many modern movements in architecture. Masters of the modern movement believed in a style stripped of all historic references and adhered instead to the new industrial aesthetics. They sought to identify global coherency through a standardized single style couched in the void of vernacular cultural symbolism! Later, this lead to the failure of modernism since the objective of internationalizing architecture contradicted with the idea that architecture as a symbolic cultural product is culture-specific. Failure of modernism eventually paved the way for the reintroduction of cultural symbolism that later evolved into Post Modernism.

The language practiced by artists and architects of a time is given over to the era in which they exist. Therefore, the image of the society that fashioned itself, after the turn of the century was based on the fashion in vogue; the '*machine-aesthetics*'. By the middle of the nineteenth century the preference was for *streamlined* objects. Only Frank Lloyd Wright had been fighting for all his life to develop an architecture that is organic in spirit and culturally bound to its context. He detested the absence of spirit, emotion and symbolism in design and the *achieved unification* in style. Although for many years architects dictated the '*architecture-beautiful*' to the people presuming that these would suit well to their needs; be it physical or emotional. Through the recent developments in architecture and Post Modernism environments which generate imagery of the type of places and things that people are familiar and comfortable with are created.[5, 51] Robert Venturi realized the lack of symbolism in architecture and called for a return to cultural symbols by providing the world with pioneering glimpses of Post Modern designs.[14, 52] The minimalist architecture of the Twentieth Century could be viewed as a cleansing of the inspirational spirit in man's art and architecture; that all the 'bad' were removed. The emptiness that remains now is ready to be filled with a new symbolic architecture of the forthcoming era. However, abandoning of Modernism in favour of culture-specific Post Modernism establishes the universal preference of mankind to express themselves and their culture symbolically; even through their architecture.

2.4 SYMBOLISM OF COLOURS

The use of colors is symbolic in every culture since colours correlate message and image and are high impact signifiers in any cultural communication of which they

form a part.[24] No wonder, every culture has evolved its own color-symbolism for communication. Mostly the color symbolism is derived out of its natural associations that makes it largely platform independent. Moreover, the surrounding nature provides an individual with actualizing experiences that are revealing and are central to understanding communications. Colours in nature remain more or less same for identical natural elements, as ‘red signifies of blood’ or ‘green signifies leaves and foliage’. Familiarity of natural colors and forms wherever natural associations exist, enhances ‘signification’ and ‘impact’ of communication, especially when confronting heterogeneity in receptors.[32] Color symbolism of various cultures is tabulated as given in Table 2.1

Table 2.1 Symbolism of Colours

WHITE	Light, Purity, Peace, Snow, Sterility, Marriage (Western), Death (Eastern) Purity, Psychic development, Removal of negativity, Mourning (Chinese)
RED	Excitement, Speed, Power, Love, Danger, Violence, All intense emotions Assertiveness, Stimulating, Celebration (Chinese)
BLUE	Peace, Tranquility, Harmony, Unity, Order, Sky, Water, Cold, Depression, Love, Heaven, Depth and Distances. Calmness, Communication, Masculinity, Death (Chinese)
GREEN	Hope, Nature, Environment, Renewal, Spring, Fertility, Growth, Prosperity, Growth, Freshness, Tranquility (Chinese)
YELLOW	Imagination, Hope, Sunshine, Summer, Gold, Deceit, Hazard, Divinity Self-esteem, Creativity, Friendship, Longevity (Chinese)
PINK	Love, Sensuality, Happiness, Femininity
GOLD	Abundance, Divinity, Strength, Wealth
PURPLE	Royalty, Spirituality, Nobility, Ceremony, Mystery, Arrogance Spiritual Power, Victory, Divine (Chinese)
ORANGE	Energy, Warmth, Vibrant, Flamboyant, Optimism
BLACK	Power, Sexuality, Formality, Elegance, Wealth, Mystery, Fear, Evil, Depth, Sadness, Mourning, Death (Western). Grounded, Darkness, Money (Chinese)
BROWN	Earth, Stability, Simplicity, Dull, Spiritual Death, Degradation (Christianity)
GRAY	Security, Dignity, Old age, Sadness, Boring, Mortality of body, immortality of spirit.

2.4.1 Comparison of Colour Symbolism in Different Cultures

Colors in *Native American* cultures are symbolic and varies from one another. So too, the difference in associated meanings for colors in *African cultures* and *European Cultures* as established through studies conducted over the decades.[36, 53](Table 2.2)

Table 2.2 Comparison of Colour Symbolism in Different Cultures

COLOR	Western Europe, USA	India	China	Japan	Middle East
RED	Danger, Anger, Violence, Warmth	Celebration, Wedding,	Joy, Celebration	Anger, Danger	Danger, Evil
YELLOW	Caution	Gaiety	Honor, Royalty	Grace, Gaiety	Happiness, Prosperity
GREEN	Sexual arousal, Safety	Fertility, Prosperity	Growth	Future, Energy	Fertility, Strength
WHITE	Purity	Purity, Death	Mourning, Purity	Death, Mourning	Purity, Mourning
BLUE	Masculinity, Depth, Calmness, Distances	Power, , Depth	Strength, Power	Villainy	Depth
BLACK	Death, Evil, Sexuality	Evil	Evil	Evil	Mystery, Evil

2.5 SYMBOLISM OF NUMBERS

The science of numbers stands above nature as a way of comprehending it. Numbers are the basis and principle means of representation of all sciences. Every number contains an essence that distinguishes it from another which is again culture specific.[25](Table 2.3)

Table 2.3 Symbolism of Numbers

1	Beginning, Original, Unity, Monad, Desirable, Indivisible (<i>Pythagoreans</i>)	5	Chances, Opportunity, Versatility, Challenge, Sacrifice
2	Balance, Duality, Material and Spiritual Dyad, Line	6	Justice, Marriage, Service, Healing, Imperfection.
3	Harmony, Synthesis, Self-expression, Creativity, Trinity, Fullness	7	Sacred, Solitude, Calmness, Completion, Perfection, Fullness
4	Stability, Cardinal directions, Seasons, Square, Completeness	8	Mastery, Control, Power, Regeneration, Resurrection

9	Endings, Completion, Fulfillment, Patience, Benevolence, Mystery
10	Beginning of a new cycle, Absoluteness Completion
11	Dreams, Spiritual manifestations
12	Represents Church
13	Spiritual Transformation, Death of old for the new, Betrayal, Unlucky number

33	Spiritual transformations
40	Number for trial or testing
100	Completeness or plenitude.
666	<i>Beast</i>

2.6 SYMBOLISM OF FORMS

The *Pythagorean* school of thought related the properties of number and geometry to meanings that were thought to exist independently of the thinker. On the other hand a religious symbol translates human situations to cosmological terms and vice versa, by revealing the unity between human existence and structure of the cosmos.(Table 2.4) The cosmological significance of symbolism thus allows a person to escape a subjective situation and recognize the objectivity of his personal experiences.[26]

Table 2.4 Symbolism of Forms

POINT	The beginning of geometrical matter. No length, breadth or thickness. Unity, Monad
LINE	Extension into the first dimension. Have length, but no breadth, Dyad, polarity, Symbolically, the will of God to manifest yet remaining hidden
TRIAD	Visible dimension, God-given form, Trinity, Fullness
CUBE SQUARE	First solid, has length, breadth, thickness. Takes into third dimension. First descent into matter. Square depicts cardinal directions.
PENTAGON	Raising the potential of matter. Breathing life, and giving intelligence to matter. Unity added to matter. Man symbolically joins heaven and earth when expressed as a pentagram.
OCTAGON	Resurrection, Baptism, Rebirth
CIRCLE	Perfection, Equality, Origin and culmination of polygons, Eternity, Without beginning and end, Time-less

2.7 FORMS FROM NATURE

Nature provides an ideal source for architectural forms which are variations of the basic shapes like cone, cube, cylinder, sphere and pyramid. Besides, these forms are platform independent, free from cultural bias and effective in projecting global images. The *Sydney Opera House*, Australia and the *Lotus Temple*, New Delhi are examples that use natural shell shapes in their roof structures thereby, effectively signify global ideals.(Figure 2.3) Buckminster Fuller used natural ideas in the design of geodesic dome which is similar to 'alveoli'. In the construction of these domes, straight basic elements are interconnected to form a rounded surface.(Figure 2.4)

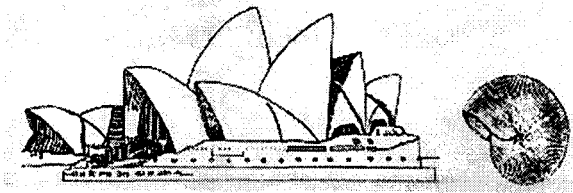


Figure 2.3 *Sydney Opera House*



Figure 2.4 *US Pavilion, Buckminster Fuller*

Communication in architecture can also be accomplished through geometric symbolism. Symbol here is an important part of such architectural designs and a way such buildings "talk" and communicate. In the great cathedrals of Gothic Period, the large rose window pointed to sun and light is used to signify Christ; '*the light of the world*'. [54] The circular, wheel-like shape symbolizes eternity and the 'Eye of God'; the wheel of fortune discussed by Ezekiel in the Old Testament.(Figure 2.5) The columns of these cathedrals signify '*heavenly forest*' that holds up the sky canopy and leads the observer's eye upward; even to the heavens.



Figure 2.5 *Symbolic heavenly forests*

2.8 SYMBOLISM OF LIGHT AND SHADE

Light is one of the revealing elements of life that signifies life itself, whereas ‘dark’ signifies death and the frightening existence of things beyond the reach of human senses which exercise power on the living. The relevance of life-death symbolism is established in the studies on the ‘Batammaliba’ architecture and the ‘Kabili’ house.[36, 55] Light is the visual counterpart of heat and there is creation of depth due to proper division of light and shade with which the form of the object is revealed. Sharply separated areas of homogenous brightness promote neither ‘shadow effect’ nor ‘three-dimensionality’ whereas, visual contrast in colour, texture, sculpted details or simple highlights impart visual significance and makes a visual expression overstated.[56] Judicious distribution of light imparts unity and order to the form of any complex object. Illumination also assigns appropriate emphasis and establishes differences in accordance with its designer’s intention.

2.9 SYMBOLISM IN LANDSCAPING

Landscape elements too bear role of signification in various cultures around the world. Architecture of the built and landscape compliment one another in creating symbolically charged environments that makes meaningful the rites, rituals and their daily choreography.(Table 2.5)

Table 2.5 Symbolism in landscaping

Acacia Tree	Permanence
Pine Tree	Longevity
Coconut	Purification, Protection, Chastity
Eucalyptus	Healing, Protection
Cypress	Nobility, Longevity, Healing, Comfort, Protection
Bamboo	Youth, Perseverance and good luck
Sandalwood	Protection, Healing, Exorcism, Spirituality
Tamarind	Love
Henna	Healing
Tea	Riches, Courage, Strength
Saffron	Love, Happiness, Lust, Strength, Psychic Powers
Water lily	Fortitude
Sunflower	Fertility, Wishes, Health, Wisdom
Orchid	Patience, Endurance
Lilies	Profusion
Lotus	Perseverance, Divinity
Jasmine	Friendship
Hibiscus	Lust, Love, Divination, Profusion
Hydrangea	Achievement
Begonia	Perfect Yin/Yang Balance
Cherry	Fruitfulness
Grape	Charity
Date Palm	Fertility, Potency
Plum	Healing, Beauty, youth
Water Melon	Bulkiness
Cashew	Money
Mushroom	Suspicion
Grass	Psychic Powers, Protection

Though symbolism with its basic sources and role in architecture is brought to light generally through the research in this Chapter, it is also important to study the response of specific communities of people and the basis of their architecture in an effort to establish the symbolic nature of humans, the relational nature of architectural communication and the role of symbolism in the creation of communicative architectural forms which are elucidated in Chapter 3.

3.0 RELEVANCE OF SIGN AND SYMBOLISM IN THE MAKING OF ARCHITECTURE - CASE STUDIES

Architecture essentially is a product of culture with its values, beliefs and structure transformed into built forms by designers for a people that constitute a society. Any society has evolved its own social systems with patterns of behavior that necessitate spatial settings. The very notion of culture in the earlier days is bound up with the mid-nineteenth-century world of industrialization, urbanization and colonization. The Culture meant; what was most elevated, sensitive, essential and precious; the most uncommon in our society. Culture was viewed therefore, as the product of an evolutionary process culminating in European bourgeois society which also provided a bulwark against the vulgarity and incoherence of the industrial city. However around 1900 AD anthropologists and progressive intellectuals began to use the plural cultures as a challenge to the Eurocentric attitudes bound up in the early sense of the word. The new usage reflected the emergence of '*cultural relativism*'; the notion that each culture is coherent and valid in its own terms. Although this is clearly less elitist and ethnocentric, the assumption that culture is a stabilizing influence carries over from the early definition.

A culture is assumed to be enduring, traditional, structural; it is a process of ordering, not disruption; it does not normally survive abrupt disruptions. Anthropologists and folklorists, who shared these assumptions, typically denigrated cultural mixing, instead sought out the ever-shrinking number of isolated cultures; those seemingly remain untouched by modern influences. Eurocentric cultural definitions and civilizations based on philosophies that are mostly an expression of the then prevailed societal conditions in Europe gave diminished importance to individual which resulted in expressions of idealized societies. In terms of architecture, it gave rise to abstract built forms and cities that comprise of very large conglomerations of people sharing the same habitat but with no common beliefs and values. Though, the abstract built forms were initially invigorating to eyes, later these failed to sustain interest and meaning in its users.

Architecture is an embellishment of the needs and desires of people manifested through the response of its designer to a set of spatial criteria in order to decipher their values and culture with its systems. Moreover, it remains more than a social art and responds sympathetically to the societal structures; a form of non-verbal communication which symbolically evokes meaningfulness in its users. Though the role of symbols in every culture; both civilized and pragmatic, has been established through studies world over; only detailed case studies would establish the relevance of signs and symbols in architectural communication even in non-traditional societies; both textual as well as cosmological.

3.1 CASE STUDY 01: PURITAN ARCHITECTURE AS A SYMBOLIC EXPRESSION OF THE WORKING OF GEIST THROUGH MAN

The Colonial Puritans of America are an appropriate ‘faith community’ with its cultural expressions manifesting their faith based on their religious text in the physical world. American Puritans broke off from the traditional orthodox ‘*papacy*’ and are known to have a strong religious and scriptural basis in the derivation of meaning for their life and architecture. They chose to manifest ‘purity’ and symbolically expressed the ‘higher spiritual realities over mundane physical life’ even when the later lead to paradoxes in their life apparent, thereby qualifying themselves as an ideal sample for a non-traditional, textual society.

Studies on the reasons for the fall of Modern Architecture and the emergence of Post Modernism establish the universal human desire to express cultural identity by encoding their architecture and landscape with religious and cultural symbols.[3, 9, 55] Culturally structured and symbolically coded architecture of today forms the heritage of tomorrow and the basis for future architecture in establishing a meaningful continuum. Culturally charged built forms provide the right symbolic setting to perform the ‘*daily choreography*’; be it routine or ritual, and to ‘*act and reenact*’ the past in the present. Puritans are no exception for they chose the medium of architecture in order to communicate the spiritual realities; the sheer basis of their ‘*election*’ and puritan life to the Church in specific and to the watching world in general. Further, through their life and built forms; by ordering and patterning these,

they symbolically manifest the working of the Universal Geist as expressed through their text of faith.

The role of religion in shaping the architectural landscape of any culture is well-established and religion with its symbolic systems and structures makes its manifestation in its respective architectural expressions.[55, 57-59] The influence of the consumerist ethos, industrial and capitalist spirit in the later American folk architecture is also conclusively established.[60] Modern social science observed that the Protestant ethic and spirit of capitalism are very much intertwined in the Western Society and an 'understanding of meaning' is essential to unfold human actions in such a society.[61] Weber approached the Protestant doctrines and the political force of Karl Marx from an intellectual background and he found both these are promoting a practical economic end. He separates off capitalistic enterprise from the pursuit of gain, because the desire for wealth has existed in most times and places which has almost nothing to do with the capitalistic working. Capitalism in essence is the operation of buying and selling of goods in a rationally organized administration aiming to accrue wealth and engage it in leisurely pursuits. In a rationalized capitalistic enterprise, two important things are therefore implied: *a disciplined labor force* and a *regularized investment of capital* necessary for the industry. The essential capitalistic character is distinctively moral and functions under an unusual self-discipline. This kind of *worldly asceticism*; the practice of the denial of physical or psychological desires in order to attain a spiritual ideal or goal, of Puritanism is elucidated through the concept of '*calling*'.

The notion of '*calling*' was introduced by the Reformation which refers basically to the idea that the highest form of moral obligation of the individual is to fulfill his duty in worldly affairs. The idea of '*calling*' was further developed and strictly followed by the various Puritan sects: *Calvinism*, *Methodism*, *Pietism* and *Baptism*. The central notion of Calvinist doctrine is *predestination*; that some human beings are chosen to be saved from damnation, condemnation and poverty, while others are not, but predestined to be poor, damned or condemned by God. This doctrine establishes that God has eternally chosen those whom he intends to save. In modern usage, predestination is distinct from both *determinism* and *fatalism* and is subject to the '*free decision*' of the human moral will. This doctrine also teaches that salvation is due entirely to the eternal decree of God. It is from this understanding of the predestination that the capitalist spirit was born. This led to the formation of two very important aspects of their behavior pattern. Firstly, it becomes obligatory to regard one-self as chosen; lack of certainty being indicative of insufficient faith. Secondly, performance of 'good works' in worldly activity became accepted as the means by which such surety of calling could be demonstrated. Eventually materialistic success came to be regarded as a '*sign manifest*' of the One being the elect, through calling. The result of such an understanding morally permits One for the accumulation and display of wealth so far such accumulation was combined with a sober industrious career in the effort to build-up the *puritan utopia*; an ideal commonwealth whose inhabitants exist under seemingly perfect conditions. However, accumulation of wealth was condemned if it is spent in a life of luxury and leisurely self-indulgence. It is further argued that Calvinism; the theological system of Calvin, marked by strong emphasis on the sovereignty of God, the depravity of mankind and

the doctrine of predestination supplies the moral energy and drive for the capitalist entrepreneur. This doctrine having an 'iron consistency' in the bleak discipline which it demands of its adherents thereby, Calvinist ethic introduced an activism into the believer's approach to the worldly affairs; a drive for mastery in a zealous quest to achieve virtue in the eyes of God. Thus, the religiously cultivated man is *the one who makes his behavior in tune with the intrinsic harmony to the cosmos; the great Geist*. Every such religious doctrine teaches people to behave in a particular orderly way in order to have a peaceful, blissful and a problem-free life in this world that springs from the concepts of purity.[13] They legitimize this blissful life by way of necessary structured ideas and socially accepted behavior patterns that are based on authoritative texts of the religion since it is deeply concerned about the human life and behavior which manifest in the total sphere of life; be it work, ethics, economic or social life.[62] In this respect all religions have their functions which work toward one goal structured in the conditioned behavior patterns, architecture or the like so as to facilitate one to live harmoniously to oneself and to the society. The life manifest of the Colonial Puritans by way of their built forms is no different which vividly expresses their faith; the working of the universal force through man in transforming the elect through their ascetic Puritanism.(Figure 3.1)

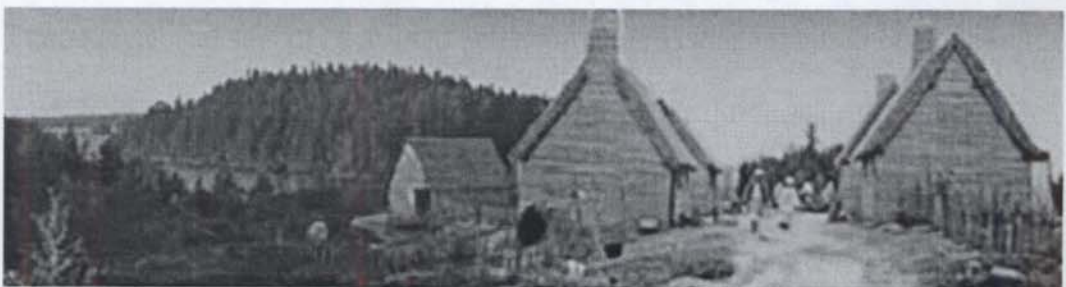


Figure 3.1 *Pilgrims Settlement; in harmony with nature even in the absence of basic facilities*

3.1.1 Settlers and their culture

The Puritans who settled in New England in the Seventeenth Century established a profoundly self-conscious way of life that embraced every aspect of their lives including their dwellings and architectural landscape. Though the Colonists brought with them the English cultural heritage which is evident in their writings, laws and architecture they also had particular principles; social and religious, that were deeply opposed to Elizabethan standards.[43] In their earnest effort to create an 'ideal commonwealth' signifying their own purified ideas of godliness, they amended many aspects of their English heritage in order to symbolize more accurately the 'puritan ideals' that has a biblical basis. It is of no wonder that the Puritans discovered architecture and site planning as provocative didactic tools. Their architectural landscapes manifested a non-European expression of their believes and fears which signified a microcosm of God's exacting structure for the universe that constantly reminds them of the desired puritan way of life.

Many of the Puritans were fervent separatists who sought to purify the Church of England by creating a religious commonwealth that respected biblical injunctions, facilitating the working of the Spirit through man. In this continuing American theme, they strived to celebrate '*self-confidence and pride*' in part from fear of not being able to follow their own ideals. The Puritan goal of manipulating material life for spiritual ends deeply penetrated every walk of their lives. The Puritan leaders established a system that linked most aspects of daily life with more abstract issues of religious sentiment, social order and family bonds in which process they began a tradition of prior ordained, symbolic dwelling forms that established a continuum through many American housing types. Further, thanks to the belief in the sanctity of the hierarchy

that existed among them based on predestination, they were also convinced of the binary oppositions like; rich and poor, sinner and elect, slave and master, that gave meaning to them.[31, 55] Therefore, it facilitated them to live a highly structured, logically explained and strictly enforced hierarchical life, right from the church to family. Yet, each of them had freely chosen to obey or if necessary to dissent, since they are bestowed with the faculties of a rational soul. The tension of 'choice' on one hand and rigid laws and duties on the other, created a perilous set of paradoxes. They, in their incessant self-doubt; their suspicion of their own senses and emotions, buttressed themselves with *visible signifiers*; their architecture, landscape and every design that is a symbolic visual expression; an 'image' of the ordained model. So they intentionally created an environment in which the houses and towns signified their concept of divinely ordained structure for family relations and social life because the creation of such a world gave them joy and meaning to their lives.

Truly, the conditions in New England were primitive and of lacking which affected both their social life and architecture. Puritans suffered during the first winter in their habitations; *dugouts*, *wigwams*, hut or bent saplings covered with thatch or grass that offered only minimal protection. Such houses were partly adaptations of Indian dwellings. They also made the crude, one-room, windowless '*wattle and daub*' huts similar to the ones inhabited by poor English cotters in Yorkshire. Second major group of Puritans arrived in New England in 1630, in which year almost one thousand settlers swarmed the area around Massachusetts Bay, turning the sparsely inhabited region north of Plymouth Colony into the center of New World Puritanism.[43, 63] As the Puritan population steadily increased, the wealthier and powerful among them; the merchants and politicians, sought to construct more permanent wooden frame

houses. In a sense, they were laying out ‘*company towns*’ with ‘investment value’ and as a ‘symbolic expression’ of social hierarchy that signified various levels of blessing. Their private architecture and public town planning worked as a coherent unit in signifying the Puritan beliefs and concerns.

The Puritans’ sense of special status in God’s eyes was deeply rooted, so too their model of Christian City: “the city on a hill” on which the eyes of every other people are fixed. Winthrop’s city was foremost a religious symbol as the architect envisioned the legacy; the “New Israel” or “New Jerusalem” as per the description in *Revelation 21. 2 and 16*:

I saw the Holy City, the New Jerusalem, coming down out of heaven from God, prepared as a bride beautifully dressed for her husband... The city was laid out like a square, as long as it was wide. He measured the city with the rod and found it to be 12,000 stadia (2,200km) in length, and as wide and high as it is long. [54]

In Massachusetts, the holy commonwealth needed a definite form, a ‘visible signifier’ which necessitated them to impose a defined order on a seemingly chaotic reality around. It seemed possible only in disciplined groups in towns and cities under the authority of a minister and a governor. A notable source for Puritan planning in New England is an anonymous document called *The Ordering of Towns* which proposed a townscape of six concentric circles set within a square six miles to a side.(Figure 3.2,3) The meeting house; *Old Ship House*, at the center determined the size of the township, for no one was allowed to live more than one and half miles away

from it, in order to assure regular attending; signifier of a life of constant fellowship. Town records provide numerous cases of people being required to move closer to the town center superscripting even private property by the public order.

The model town was intended to be an agricultural settlement with a tight core comprising of home lots, located in the center of the village along with the meeting house.(Figure 3.4,5) Each family's possessions of arable farmland, grazing pasture as well as common fields surrounded this nucleus of buildings. The right to establish a new town is obtained from the Massachusetts Bay Colony General Court, which evidently followed *The Ordering of Towns* in its decisions. Allotments were based on the 'position and wealth' of a family in a community, so that the land divisions and the size of houses varied considerably, signifying the Puritan structure.

The meeting house was always the first prominent building to be erected, which was a consistent pattern throughout the settlements.(Figure 3.6) As opposed to Anglican churches, with their steeples and elegant Baroque ornament, the meeting house was an unpretentious structure for they had no faith in the right to consecrate buildings. They considered the congregation as the church not the building in which they assembled for worship. Since church building was not considered sacred, it was used as a stage for many public functions. Next to the meeting house, found the place for house of the minister and homes for the prominent families in quite semblance to the layout of a cosmological city.[12]

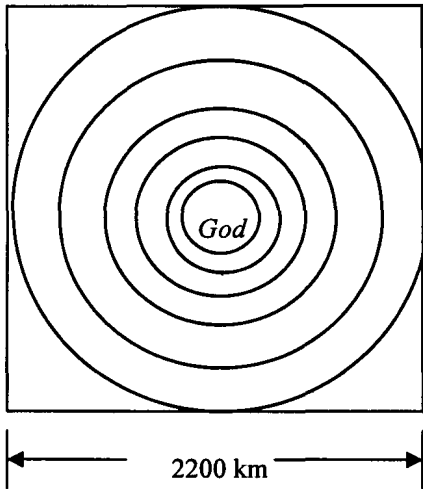


Figure 3.2 *Zion – the Heavenly City with God at the Center*

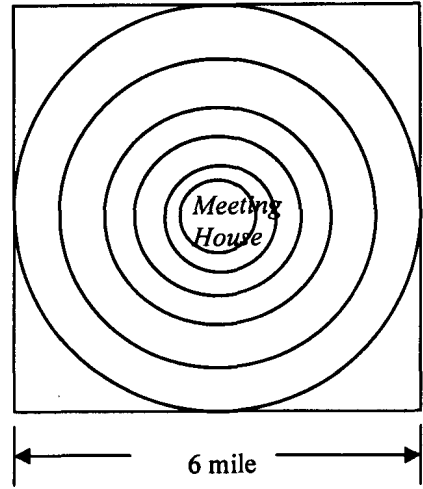


Figure 3.3 *Puritan City with meeting House signifying God, at the Center*

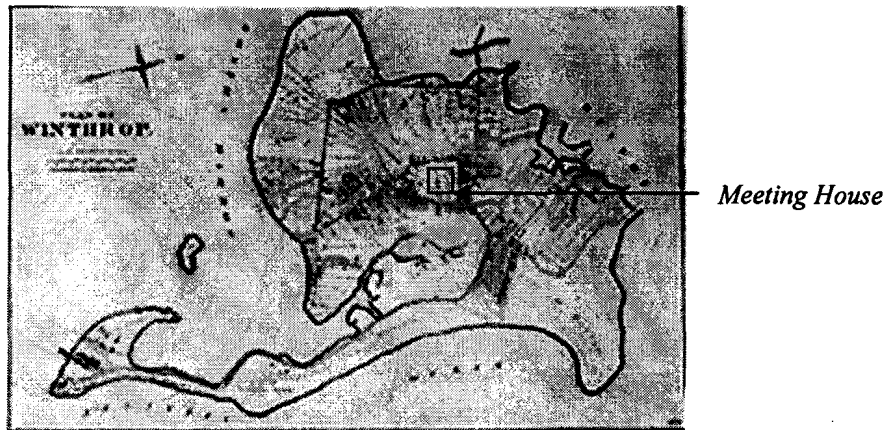


Figure 3.4 *Winthrop City Plan*

Houses of gods and their appendage structures are normally decorated richly with iconographic details depicting religious myths and knowledge. Such ornamentation, beyond encoding knowledge also served to declare their delight in celebrating built forms. Even the Puritans displayed an attitude for ornamentation, especially on the built forms of the blessed; the ministers and the wealthy, for which the *Parson Capen's* house bears witness.(Figure 3.7)



Figure 3.5 *Puritan Home*
Simple, straightforward and elegant in
design and construction



Figure 3.6 *The Old Meeting House*
The center of Puritan City



Figure 3.7 *Parson Capen House, Topsfield, 1683 MA*

The early colony houses are surprisingly varied in appearance, symbolic of the regions in England from where they originated. These vary from one-room, framed cottages; sixteen to twenty feet square, with stone or brick fireplaces, houses with kitchen and a lean-to added to the rear, creating the familiar *salt-box* appearance, to ten foot by forty foot *log houses* with two hearths. Other primitive structures are

adopted from English cottages and barns. Gradually, more people were able to afford wooden frame houses retaining their social hierarchy. By 1630s, as these *pilgrims in progress* who first erected one-room or two-room thatched cottages progressed, they began constructing more substantial fairy houses of solid timber. The *hall and parlor house* type was the most commonly constructed in New England. Though the carpenters deviated from the Baroque fashions and adapted their designs to the climate and materials, they essentially followed the deeply rooted religious and social beliefs. No wonder, theologians often used architectural metaphors to instruct their congregation regarding God's intricate structure of the universe.[64] Thanks to the bountiful supply of wood and its high thermal resistance, it became an accepted practice to finish the exterior with *clapboards*, always laid horizontally and left unpainted. Wood shingles replaced English tradition of thatch for roof coverings, especially after several early fires. Use of vivid colors for contrast was evident in puritan houses.

The 'fortress-like appearance' of the Seventeenth Century colonial house also characterized it from contemporary English dwellings. Its door was a solid barrier of several layers, studded with pieces of metal. Such heavy, defensive doors were unknown in England. Windows were few and small in size for ensuring efficiency and economy in operational costs. Oiled paper was used in windows while later; a few brought English *leaded casements*. These Puritan preferences signify a peculiar attitude toward the world outside that was gradually altered in the next century. Nature was not considered a teacher; gentle and inspiring, to instruct the puritans of universal values. Therefore, walls of the house were decidedly made a barrier to the outside, signifying discontinuity between interior and exterior domains.

Interior of a New England house has all the more symbolic features that are objectified transformations of distinctive ideals of the Puritans. The family lived according to the rules and performed the duties of their covenants in the interiors. Moreover, it was considered the duty of every individual to oversee the salvation of everyone else either by way of subordination or coordination in the community. Thus self control, essential to be instilled in each individual is enforced by the group. Composure and concord are especially difficult under the cramped living conditions for few families are composed of fewer than six people, with at least one servant or apprentice among them. Puritans considered it important to live together sharing the same space for that was considered most pleasing to God promoting virtuous living, good work and industriousness.

Architecture aided the delicate duties of self control and industriousness in the Seventeenth Century colonial house consisting of very rarely more than two downstairs rooms. The *hall* or *keeping room* is the central activity square of the family which served as the place for cooking, eating, making soap and candles, spinning yarn and weaving homespun cloth, sewing shoes, repairing tools, keeping accounts and also reading scripture. It is here men and women, children and servants worked together under each other's watchful eye. This is the case ordained even in larger estates where the focus was on the hall which is central to domestic production. Parlor was another downstairs room in a typical two-room house. It is in the parlor the bodies were laid in state, honored guests were received and the family treasures brought from England were displayed though they chose to be 'Puritan' in all other English traditions. The parlor often contains parent's bed and its emergence marks the

beginning of separation between the 'public and private', 'intimate and formal' that was just beginning to reshape their house forms and social life of families. Though the parlor was a space for certain domestic functions and also intended for parental privacy at night, it was never a place where one could withdraw from the intensity and scrutiny of the communal life. Though, smaller rooms for service and storage gradually appeared in New England Puritan houses these were never allowed to be used as personal retreat spaces. The cellar, often simply a hole in the under ground part of the house with sloping sides and dirt floor, provided a place to keep milk and potatoes from freezing; which was never the practice in England, but the Puritans kept on adding more storage spaces in contrast to the biblical stand of 'accruing treasure in heaven'. In due course of time, kitchen was shifted to the middle of the lean-to and the hall was transformed into a family sitting room and a general workplace. Most houses have up stair chambers that served as bedrooms and general storage areas. Even in one-room houses, there is an upper chamber which children and servants reached by an extremely steep staircase. Around their simple bedding would be piled up all sorts of barrels, skins, bags of grain, yarn, spinning equipment and lumber; that archaic team of odds and ends.

Architecture signified a spirit of joyful humility and one could find adornment even on the austere forbidding houses with weathered *clapboards* and tiny windows. Long before delicate shapes and formal plan of the *Georgian* era became fashionable, the Puritans introduced purely decorative features into the frames of their houses and by 1650s, curved brackets; gracefully incised, supported many overhangs. Handsome decorative drops; pendills, in opulently round shapes hung from corners for which the

Parson Capen's house at Topsfield is a standing testimony. Such details were purely decorative; signs of the carpenter's skill, a counterpoise to the boldly exposed structural elements. In due course, more and more signs of Puritan's delight in display appeared within the house. The few furnishings were often carved into elaborate rounded forms. Cupboards and chests were painted in vivid polychrome with the owner's name surrounded by hearts, flowers and geometrical designs. Even the walls were vividly painted in red, green and purple. Sometimes dots of color were applied with sponge, although this exuberant practice was more common after 1700.

The New England Puritans took great pleasure in these decorations which they have derived from rural folk traditions, in order to signify paradise indoors. Puritan houses, like their lives, depicted order and playfulness, solemnity and exuberance, delicate detail and forthright structure. The puritan spirit found artistic expression in a manner that was characterized by a wonderful sense of simplicity of form and directness in planning. The reason underlying their religion and architecture is the attitude; *not to rely on current or previous fashions, but to create a strong and simple directness of approach*, to the elemental truths embodied in spiritual life and in the creation of architecture. Just as the group created an elaborate 'morphology of conversion', in which each stage of God's grace was signified through a set of signs, the New England colonists leaned toward literalness in the houses they built and the towns they planned.(Table 3.1) Their architectural forms revealed God's will, at the same time testified to human fallibility and proneness to temptations. Puritan's earnest desire to make their beliefs more substantial in correct behavior and even in the

architecture of homes and larger community plan encompassed a deep-seated doubt about their ability to act as they should without constant spatial reminders.

Table 3.1 Symbolism of Puritan architecture in USA

Spiritual message	Manifestation in Physical form	Graphical representation
Blessing	Wealth accrued Ornamentation Nearer to the meeting house	Puritans took pleasure in decorations and symbolically represented paradise indoors. Larger, wooden houses, Larger windows
Joy and peace	Order, playfulness, solemnity and exuberance	Polychrome interiors and furniture, brightly painted in red, green and purple
Purity, Truthfulness, Hard work	Forthright structure, simplicity of form and directness in planning, less inspiration from nature	Direct structures with delicate details, smaller windows
Power, Authority	God/Meeting House-centered lay out, Height, Ornamentation, Size and span of building, Steeple, reminiscent of obelisk, signifying power, Closer to the Meeting House	Concentric plan with Meeting House at the center, Nobles and the rich at closer proximity to Meeting House, taller structures, Ornamentation

The combination of self-confidence and self-doubt and the tension that existed between the two made manifest its imprint in the Puritan built environment; the architectural landscape, would remain an important signifying aspect of their culture in specific and the American culture at large, for generations to come. The study thus, establishes that puritan architecture is a symbolic expression of the Geist as described in their text of faith that defines their life and culture. It is also the responses of designers to a set of needs; spatial and emotional, physical and spiritual, signifying their societal structures. Thus, architecture is more than a social art; *a provocative didactic tool, enabling to communicate non-verbally to the watching world*. Further, it establishes that the religiously cultivated Puritan man is one who makes his behavior in tune with the intrinsic rhythm, harmony and the order of the cosmos, since he is in

constant striving to facilitate the working of the universal force through him. Thus, he strives to depict *God's will* and *divinely ordered new world order* in his entire life; the progressive journey to Zion. Puritans' lives had many paradoxes emanating from a combination of self-confidence and self-doubt. Yet, the tension between the two and their faith defined their life and architecture. Thus, architecture of the non-traditional Puritan society signifies their faith as their choices are expressed by way of built forms and remains a symbolic spatial communication.

3.2 CASE STUDY 02: ARCHITECTURE OF COSMOLOGICAL SOCIETIES AS SYMBOLIC SPATIAL EXPRESSIONS

Modern architectural expressions apparently lack relevance and appropriate continuity with the culture and heritage of its people, largely due to the absence of symbolic relationships which unify built forms to the respective cultures. It is ironic to learn that even through preservation efforts contemporary designers generated built forms, social and economical conditions detrimental to the very existence of the people for whom these projects are conceived, culminating in forcing out the residents which makes them lament:

"Beneath the stucco of tourism lies a fascinating, tolerant, laid-back western town...We have made peace with Santa Fe style, for you have to, if you are going to live here and stay sane".[65]

More importantly, such architectural expressions gave rise to destructive stresses, anxieties, crimes and illegal activities that spoil the very enjoyment of being in a civilized community. Studies proved that crimes are facilitated by an increased

breakdown of social mechanisms that once kept it in check and gave support to police activity. Moreover, crime rate cannot be controlled just by an increased police force.[50] Although the heterogeneity and abstractness of modern habitats and other built forms may be intellectually desirable, these in effect crippled our ability to agree on joint actions required to maintain the social framework that is essential for the survival of any society. On the contrary, primitive societies having shared beliefs, values and notions of a coherent culture and their symbolic habitats with cosmological and religious basis, worked well. Many studies conducted elsewhere reiterate the success of traditional cosmological models over the times.[12, 45, 55, 66]

In search of freedom the designers of modern architecture gave expression to their responses. These winds of change which caused free expressions also sowed the seeds of destruction by way of unhealthy and unsafe environments. The internal noise of some of these modern habitats is too disturbing that they had to be pulled down, even at a high social cost.[50] At this crucial juncture, designers have to turn around and take cognizance of the plural cultures which were once labeled *primitive*. Surprisingly, these echoed definite order and structured relationships that make them work well in harmony with nature. In order to understand the dynamics of such coherent societies and their community spaces, the 'civilized' had to look into the mud houses in African Sudan or to the Neolithic Settlements in Hacilar, Turkey, or the Sinhala houses of Sri Lanka.[9, 36, 50, 67] A turn in the thinking and an enquiry into the definition and classification therefore, was unavoidable. In search of spaces that are inherently defensive and enabling the lives of its users, architecture of the primitive had to be explored. It is here, the normal reasoning doesn't found to work

and therefore, it brought forth an inevitable need for a super reason; the spiritual or cosmological basis, for interpreting these spatial expressions. The basis of the reasoning had to be founded in religion at large and the odds need to be levelled out seeking a rationale that is relevant. In pursuit of the primitive mind and their world, Durkheim and Levi contributed their pioneering efforts which paved the way for a deeper understanding and interpretation of their cultural expressions and for the appropriation of these to the contemporary needs.[31, 68]

Emil Durkheim proposed criteria and basis to identify the simplest and most primitive religion which he defined through studies on the elementary forms of religious life as '*a unified system of beliefs and practices relative to sacred things, that is to say, things set apart and forbidden - beliefs and practices which unite into one single moral community called a church, all those who adhere to them*'. [41] Even the most primitive forms of religious systems have the elaborate, present-day system since all religions are basically the same. The basic religious structures are very well found in societies whose simplicity of organization is nowhere exceeded. Secondly, it must be explainable without the introduction of any element from a predecessor religion. Although he is not concerned to bring out which religion is authentic and which is not, explains religion from the social point of view with its influence on the society and its cultural expressions in order to nurture the three basic elements of all religions; *beliefs, practices and community*. Further, these elements are examined in detail to establish the important role played by religion in the primitive societies in ascribing values to some things, concepts or ideas and nomenclate these as *sacred or profane* which becomes a norm for future generations. In all religions, a power that

controlled its collective consciousness is evidenced and men as symbol-making animals ascribe value to symbols and passes on to their generations. Symbols possess a power to integrate as well as disintegrate individuals, families or the societies by way of classification. The religions that are largely defined by supernatural, cosmic and mysterious orders and beliefs also fashioned all their respective cultural expressions in signifying relationship with their collective consciousness.

Therefore, all religious representations are manifestations of the collective consciousness that are also evidenced in all their cultural products. Rites and rituals are ways of acting and reenacting religion in the midst of assembled groups and it's very propose is to evoke, maintain or even recreate the needed mental setup in those individuals and groups in a way to give them fresh, personal experience that makes them feel acceptable. Even the contemporary church in all its cultural expressions displays every characteristics of primitive religious realities, almost in strict adherence to Durkheim's theory; signifying expressions that could be traced to their practices which unites its members as a church within a set of doctrines and dogmas which are performed within symbolically charged settings; *architecture of their built forms*. Their values, norms and structures; the cultural systems, are passed on to generations by their forefathers continued, even continues to mould their cultural expressions. Transfer of these values happens through their rituals; enacting and reenacting of these since, in the absence of experiential knowledge for individuals symbols become mere marks of identity with lost meaning.[68]

Levi-Strauss, on the other hand, accepted both religion and magic as forms of science, since each consists of the essential components; event and structure, and emphasized the need to treat both these equally valid in the evolution of knowledge.[31] He presented the radically different view of social structures in 1945, as a '*model in the human mind*' with its basic idea borrowed from Roman Jakobson's '*theory of distinctive features*' which states that the human capacity to 'encode and decode' sound patterns into meaningful speech forms depends on a '*capacity to discriminate sounds as bundles of binary oppositions*'. He appropriated the theory of '*binary oppositions*' in '*structuralism*' that forms the basis for semiotics; the study of signs where sign is a union of signifier and signified or is anything that stands for anything else. He applied the theory in anthropological purposes proving that many of the nonverbal elements of human culture such as cosmologies, art styles, architectural designs, layout of villages and the like could be broken down into sets of culturally distinctive features which are recognizable as binary oppositions. These, as in the case of phonology, is the 'matrix combination of sets of such distinctive features' which determines the characteristics of a cultural feature in any particular ethnographic setting.[57] The pioneering proposal gave fresh impetus in the understanding and interpretation of the architecture of built forms and enabled designers to translate messages embedded in relationships. He, by not rejecting myth as unscientific; which on the contrary is an expression of the unobservable realities in terms of observable phenomena, located it at the very core of all forms of religious expressions since these give forms to the cultural products, even the respective architecture. Further, beauty intrinsic of miniatures is derived out of the virtue of its dimensional relationships provides a basis for the choice of cosmological models by primitive communities. The

proposition about miniaturization is extended even to the natural size, thanks to the implied reduction in scale since concretization in any medium always involves giving up certain dimensions of the object, be it physical or temporal.[31] Thus, a fair basis for understanding the concretized cultural expressions; otherwise classified as useless, is offered through the structural semiotics which is a big leap in the establishment of meaningful architecture.[57, 69] Moreover, it could be concluded from these studies that since the genesis of communicative architecture is in symbolism, symbols are the means that facilitate communication in built forms. Therefore education in architecture shall equip the students to perceive, understand and interpret symbols in an effort to create meaningful architecture.

3.2.1 Cosmological Societies

People of a culture have shared values, notions of good and bad, and ideologies on the basis of which they agree together for collective actions and generate cultural products that are signifying expressions kernel to their societal existence. A coherent culture, be it primitive or traditional possesses a well-established structure by which its cultural elements are organized. Its people's behavior too is patterned and regulated by the common knowledge and the structures existing in their minds. Moreover, these generic societal orders are symbolically manifested in their daily choreography and in all other cultural products. Further, studies conducted construes that cultural constructs are evident in their respective architectural forms; be it residences, palaces or cities. These symbolic architectural expressions in other words consists the '*frozen-culture*' or '*text in built form*', which non-verbally decipher relevant information. Conversely, it is important to understand

the order and system of a society in an effort to interpret its built forms. This structuralist stand paves a reasonable way to understand, interpret and reinterpret the symbolic architecture; primitive or traditional, that is time-tested for the advantage of contemporary cosmopolitan civilizations.

3.2.2 Cosmological Models

Religion is an expression of the human desire to communicate with God their Creator and studies have established that man possess a natural worshipping nature. God is the image of man's ultimate holy desires and an embodiment of *unattainable by him*. Words often fail in such intimate, ecstatic spiritual communications where symbolism succeeds. Symbolism often makes spiritual knowledge easy to understand and imparts deeper meaning in the members of a coherent culture. In addition, it adds certain beauty by way of miniaturization and mysticism to religion in speaking of an unseen world to be received by faith. Humanity throughout history have used more permanent materials to erect magnificent structures not to live in, but to worship gods; images to which they long to be conformed since it is within these places of spiritual contemplation that one experiences the most profound life-experiences. Symbolism facilitate the experience of such splendid spatial and spiritual experiences for its receptors as evident in Christianity, Hinduism, Islam or Buddhism.[70] Symbolism may be described as '*good fit*' between perception and cognition, form and content; the seen physical and the unseen spiritual. What good fit as suggested by Kant means:

certain essential relationships are conserved or mapped from one medium to another, in architecture, from the way an environment is used or to its perceived form.[69]

Cosmological models are miniaturized representations of the cosmos as envisioned in various cultures; *the ultimate embodiment of order and beauty, unattainable to man*. It represents a divinely ordered organization par excellence of elements that are the regulated existence of balanced exercise of forces; a vivid depiction of the creative genius, which evokes adoration and worship through effective parallelism. Moreover, any miniaturized representational form which is a composition derived from the signified naturally acquires acceptance and beauty.[31]

3.2.3 Understanding Kandyan Landscapes through Symbolism

Landscape of the royal capital of Kandy was located in the central highlands of Srilanka during the early years of the Nineteenth century where symbolic relationship between a discursive field and landscape as a signification system could be best evidenced in its geographic and temporal contexts. It is important to note that a learned *Singhalese* is perfectly conversant with the details of the system of ‘mythical geography’ and the ‘cosmological basis’ as embodied in its cultural landscapes whereby he relates himself to his family, village, nation and the cosmos at large which might seem meaningless to an external person just as the Britishers exclaimed; “*have we fought all these days for this place!!*”, unless it is understood without the personal bias, as the Singhalese perceives it.[71] The context is derived mostly from the enormous literature available on both kingship and architecture of royal capitals in South and Southeast Asia which serves as the basis of the discourse of kingship and its relationship to Kandyan landscape; a cultural product of a highly textualized society, where the authority assumed is from the texts that served as the basis of their customary laws.[9, 64] The discursive field of kingship which concerns

the understanding of the Kandyan landscape is composed of two different discourses on kingship; firstly the '*Asokan mode*', that is based upon the story of Emperor Asoka who reigned in '*Pataliputra*' during the Third Century BC. Secondly, the '*Sakran model*' composed of a set of beliefs that formed the core idea; *king, the ideal ruler, modeled after 'Sakra'* who is the king of the gods. While the first discourse contained beliefs necessary to model king as pious, righteous, and One fully devoted to the fostering of Buddhist religion and welfare of his people; an ideal humane One, whereas the second discourse on the contrary, portrayed the king as divine ruler, a god-king.[9] Both these discourses are legitimized by the precedent provided by and association with political and religious texts of authority.

While the *Asokan* discourses facilitated the production of a landscape dominated by religious structures and public works dedicated to the benefit of the people, the *Sakran*, on the contrary, signifies the divinity of the king through a symbolic architecture of poignant palaces. These mythical cities modeled after the heavenly ones deliberately deciphered a divine image to its beholder. In a cosmological society possessing a deep understanding of symbolic significances, both these discourses successfully signified and concretized their texts of authority. Throughout the entire history of Kandy both the discourses with their distinct perspectives is seen intertwined and kings adopted elements of both, in befitting manner, in order to signify their cherished ideals. This syncretism is materialized in the Kandyan landscape composed of the balance between religious buildings and palaces until king Vikrama abandoned Asokanism during early nineteenth century. He expressed his ideals by concretizing the same through an enormous rebuilding

program in Kandy where the architectural elements and spatial locations functioned as tropes that allegorically signified the discourse of Sakran kingship.(Figure 3.8,9) The cosmological cities also functioned as the ‘culturally charged stage’ for the performance of their rituals consisting of mythical events that are indispensable for the continued existence of the cosmic culture.(Figure 3.10) Rituals, in a way derive their communicative power from the symbolically charged city context and remained effective in its religious roles whose production and interpretation depended on the practices in the service of power. In the highly textual Kandyan society, authority vested with those who controlled interpretations of the regulatory texts. They assumed the responsibility for defining the society’s cultural identity through the writing of its history which is the recorded memory of the past. Thus, memory of a people could be effectively manipulated through the historical recordings in order to control their responses. The recorded memories thus formed a core factor in the Kandyan politics of power. So too, traditions are selectively maintained or invented for a variety of social, cultural, religious and political purposes, especially by the power-positions for they are a part of the continuing social conceptions rooted in the past. Although, such an attempt creates a sense of unity, it is achieved by the past influencing the future, even at the cost of minimized diversity and complexity.[72] In a way, it attempts to generate an intentional, if not a less desirable imposed unity by the denial of rich and varied expressions and experiences. The Kandyan society is believed to be formed of members divinely ordained to guard their religious traditions who set their king at the zenith of this responsibility. The notion is based on their texts containing the teachings of Buddha about the world of gods and proper rule by kings.

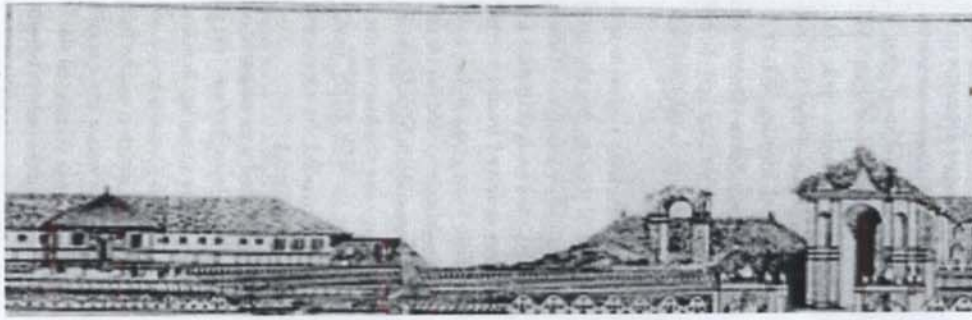


Figure 3.8 *Sketch of the palace complex with wave wall*

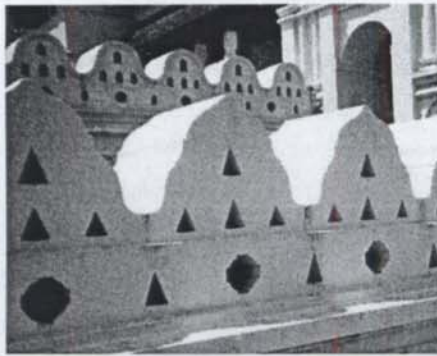


Figure 3.9 *Wave wall detail*



Figure 3.10 *Kandy in 1602*
Cosmological landscape

Mandala is the most admired symbol of Buddhist religion which symbolises the universe with its energy and the cycle of life and death. Each object in *Mandala* has significance and represents some aspect of life that serves a key role in the production of their traditional wisdom and knowledge. Their traditions are transmitted through oral, written or visual media and these to a great extent, are controlled by the rulers who often used such to project their ideals. So too, the narratives of the valorous kings of the past written by the Buddhist *sangha* were often incorporated into the ritual practices and designs of *Kandy* which in turn legitimized the rule of the kings. The written texts contributed to the basis by which the king's behavior and his

city are interpreted since, he consciously modeled himself and his city in strict adherence with the textual accounts of Sakra and the city of Gods, represented by the cosmic *Mandalas*, and his palace occupied the central mount; ‘*Mount Meru*’, the abode of gods.[9] This symbolic modeling exalted the position of king and ascribed him the image of a god. By way of parallelism, his kingdom represented those of gods and his palace symbolized the abode of gods. Although Buddhism is devoid of any creation myths, it does have a detailed description of cosmology that depicts the cyclic world systems that are created, destroyed and recreated; a symbolic depiction of which is seen in the concentric *Mandalas*. [8] So too, the depiction of water symbolizing the *Ocean of Milk* and the process of creation represented symbolically through the churning of the Ocean of milk, by way of waveform in the palace walls. Further, the Kandyan landscape, through the symbolism of both creative power of cosmic waters and the stability of cosmic mountain sought unification in the Hindu myth of celestial Ganges visible in the sky as *Milky Way*. [9, 73] The belief in the causal efficacy of parallelism transformed their Mandala-based cities into representational microcosms in every respect and a proper understanding of the Kandyan landscape solely depends on the clear knowledge of its basic symbolic cosmic model, and the texts that determine its cultural expressions.

3.2.4 Comparative Evaluation

Although, both Kandyan architectural forms manifest a cosmic order and a definite system of textual canons and principles which are their acclaimed efforts to identify themselves with the cosmos and thereby establish a harmonious life, the Sakran example depicts the use of such cosmic model for the purpose of establishing

authority by the king, through parallelism established in terms of architectural forms, metaphoric and metonymic readings. Often, such laborious and resource-consuming efforts could not get the support of nobles or even the common people and created problems for the king in due course. In both cases the basic cosmic models; both graphical and textual, are followed in its architectural forms which enabled spatial communication to signify and get harmonized with the universe. Breaking an established order in creating another, furthering the pursuit of creativity is seldom observed in these traditional processes. They remained more or less consistent in the outward expression manifesting a pseudo unity thanks to the adherence to cosmic models which exert deep-rooted religious influence and impart meaning in its people. The semiotic approach therefore, enables in understanding and interpreting these symbolic cultural products of such textual societies from where one could draw valuable lessons beneficial for the contemporary world.

Although the civilized society as the cherished ideal is promoted in all times, in reality, modern architectural expressions almost failed to generate coherence and continuity. But, coherence and continuity is quite common a norm in cosmological societies. Also, a fair basis to understand such a structured cultural expression is offered through structural semiotics to understand the concretized expressions of a culture otherwise classified as useless. It paves the way for a big leap in the establishment of a meaningful architectural continuum. Breaking an established order in the pursuit of creating another is facilitated by relevant reinterpretation of the symbols of a society. Yet, the adherence to cosmic models is prevalent even in the contemporary world pursuing change where logically it doesn't fit, thanks to its

deciding influence in shaping the entire cultural products and lives of men. Semiotic approach thus, enables the contemporary designers in understanding and interpreting these cultural expressions in order to draw from them valuable lessons in their relentless, creative efforts to instill uniqueness and harmony in the architecture of built forms, rightly through symbolism. Therefore, training in architectural education shall devise appropriate pedagogy and tools for instruction that are symbolic and facilitate the understanding of symbolism.

4.0 ARCHITECTURE AS A SIGNIFYING SYSTEM IN SPATIAL COMMUNICATION – USE OF MYTHS, METAPHORS AND METONYMS

Man cannot be not communicative any time for he is a communicative being, establishing relationships that build up a 'we group'. Moreover, the prime difference of men from animals is established through their innate ability to make symbols and use such to effect communication among them.[1, 2, 37] Architecture has always been a symbolic manifestation of any culture and its distinctive nature; the system and its relationships at large, whereby it remains a cultural product.[74] People communicate spatially as they express their spatial needs in physical settings; their homes and the cultural landscape, where their system of relationships is objectified.[47] As a cultural product, architecture has therefore, been used to express the cultural system with its components and inter-component relationships that defines and sustains any culture. Further, it has been identified and used as an instructional space where an individual member is taught and trained to be a matured member; having transmitted in him the values and constructs of the society so that he could be initiated into its full membership. Architecture as a cultural product is a creation of the human mind

through a thought process which perceive things and assimilate these by way of binary oppositions and associations.[41, 55]

There is no human society that lacks spoken language. In fact, it is communication that builds up, integrates and sustains any community. Since the response of the senses that are the basis of human perception which enables communication is relational, as in the case of auditory or color perception, it is quite logical and natural to extend the same structural nature of communication to understand and interpret other cultural products too, including the architecture of built forms. Since any society has its own structure, all of their cultural products too manifest its innate structural characteristics; be it magic, ritual or architecture. The structure increases the scope and understanding by supplying a basis for the already built-up associations.[31] Though the phonemic analysis of language is brought about by Saussure, later developed into theory of distinctive features by Jakobson which forms the underlying model for Levi-Strauss's structuralism. Thus if in language, it is the word that signifies, in architecture it is the form that signifies; both two and three dimensional. The compositional rules do matter in the generation of meaningful architectural forms and in deciding the effectiveness of forms as signifiers.

4.1 CULTURAL INFLUENCES ON CHOICE OF FORMS

Ideas concerning 'order and disorder', 'purity and profane' or 'acceptable and unacceptable' to a large extent come from religions and respective cultures. Studies conducted in various continents on primitive societies comprising of people who are uninfluenced, reduced models prove that their choices are influenced by the

corresponding religious ideas of what is pure and dangerous.[9, 13, 27, 39, 45, 71]

The role of the capability to distinguish the distinguishable is kernel for the man to be self conscious and always aware of himself as a member of a specific ‘we-group’. It is an established fact that verbal categories provide the mechanism through which universal structural characteristics of human brains are transformed into universal structural characteristics of human culture, though there exist arguments against universalizing partial data.[30] Further, if these universals exist even in the deeper level, it exists as innate patterns which in course of time humans have internalized into the their psyche along with the specialized development of those parts of the human brain in respect to speech formation, especially in regard to utterances and auditory speech reception.[57, 75](Figure 4.1)

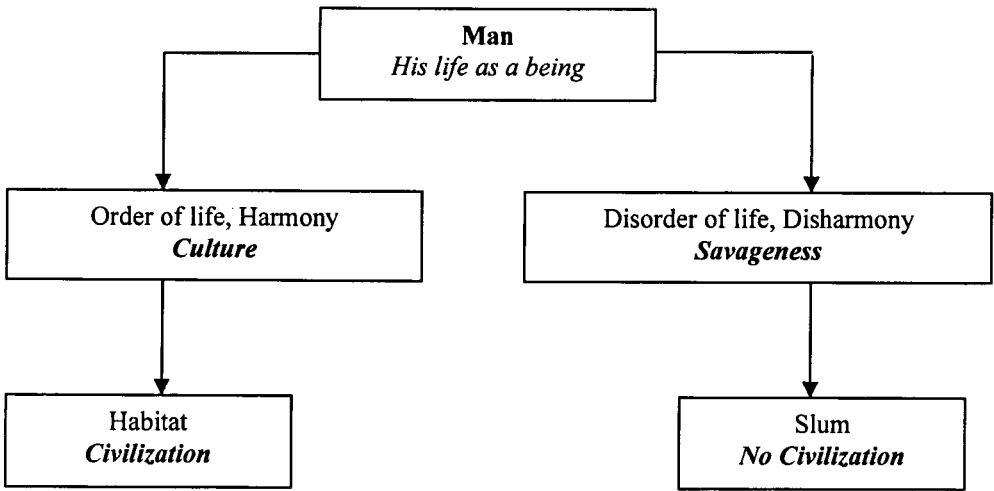


Figure 4.1 *Man and the cultural systems of transformation*

4.2 POWER OF SYMBOLS

Symbols possess power to communicate through associations and superimposition of layers of meaning in them. The structuralist thesis finds out all the

possible permutations and combinations for it proceeds by examination of the empirical evidences on a comparative basis where the ultimate object of the exercise is to discover how relationships exist in nature, how these are apprehended by human brain and used to generate cultural products which incorporate the same relationships as Levi-Strauss remarks:

"Marxism seemed to me to proceed in the same way as geology and psychoanalysis...All these showed that understanding consists in the reduction of one type of reality to another; that true reality is never the most obvious of realities...In all these cases the problem is the same: the relation between reason and sense perception".[31]

So too, by the superimposition of one schema over another, as in the case of any cultural product, the three-color traffic signal symbols give rise to its underlying meanings when its natural structure is tallying with the logical structure.[75](Figure 4.2) Architectural analogy for the traffic signal color triangle could be meaningfully constructed as shown below.(Figure 4.3,4)

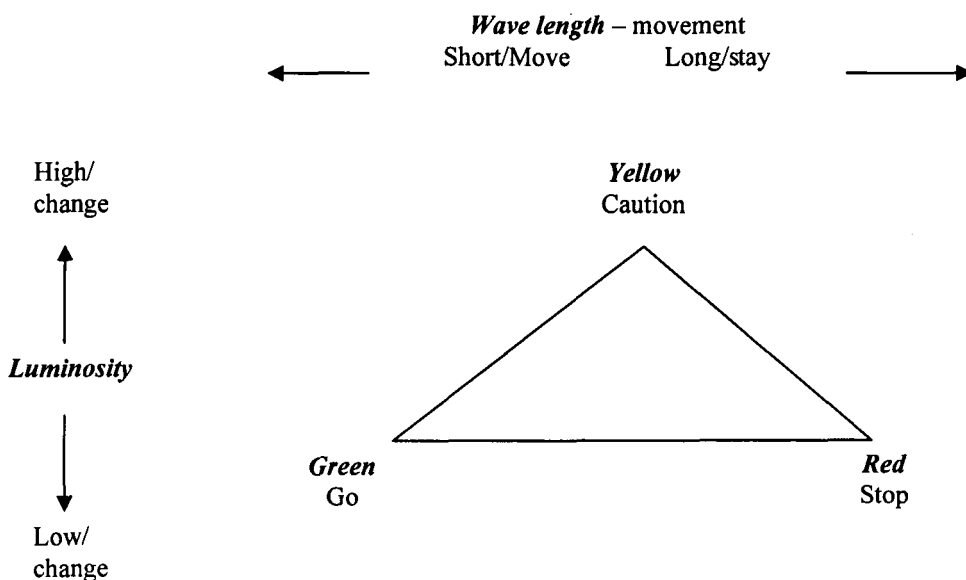


Figure 4.2 *Traffic signal color triangle*

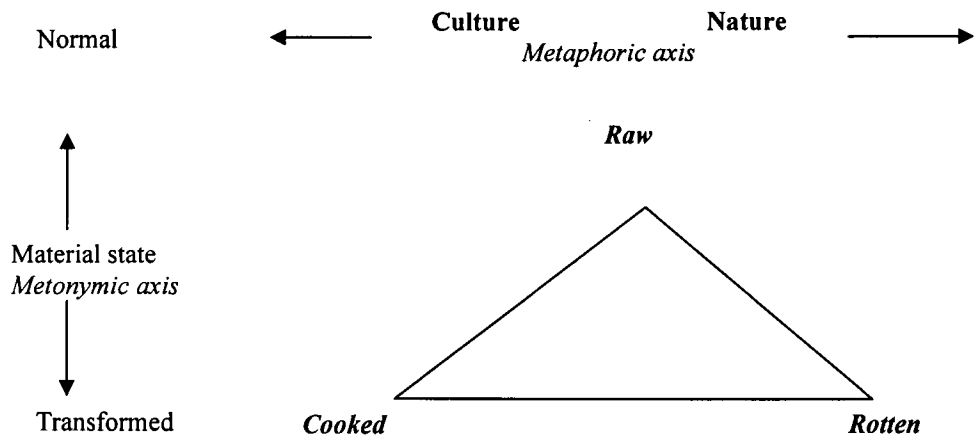


Figure 4.3 *Culinary triangle - primary form - food*

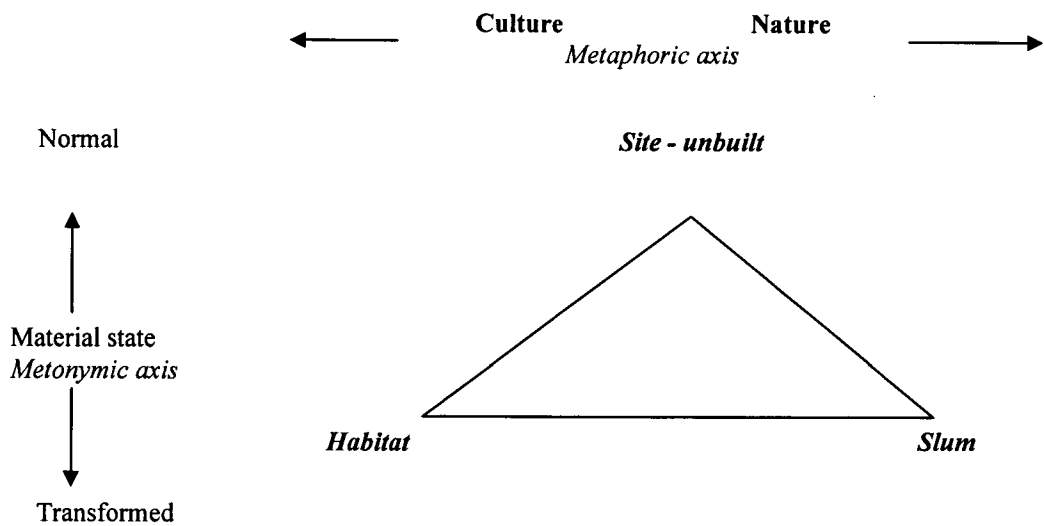


Figure 4.4 *Habitat triangle - architectural*

Symbol is a thing regarded by general consent as naturally typing, representing or recalling something by possession of analogous qualities or by association in fact or thought and these could be objects, activities, relationships, events, gestures and spatial units in ritual context where they are involved in social process; a factor in social action and a positive force in an activity field. They represent in physical form something that is non-existent and are the best possible expressions of a relatively unknown fact.[16, 31, 71] Symbols have external forms with observable characteristics that are interpretable by specialists as well as laymen and have relevant context. They produce actions and the dominant symbols have a tendency to become foci in interaction. Symbols condense objects and actions in a single formation and the dominant ones interconnect by progression of their analogous qualities or by association in fact or thought. Moreover, the dominant symbol polarizes meaning.[16]

With the Rousseau's model of man as talking animal and the sharply drawn distinction between culture which is conceived exclusively as human and nature; which is common to all animals the gap too becomes evident for man uses symbols and no other creature does use symbols. Since there is no intermediate stage for an organism to possess the ability to make symbol it is evidently one of '*kind*' and not of '*degree*'. [76] Levi-Strauss conceives human mind which is an attribute of human brain as having objective existence and its attributes can be ascertained by investigating and comparing its cultural products. This could be achieved through the study of the empirical phenomena which is the only means to an end. Further, the special marker of symbolic thought is the existence of spoken language in which

words stand for and so signify things *out there*. To be able to distinguish between the sign and the thing it signifies and then to be able to recognize that there is a relationship between the sign and the thing signified are the primary conditions for operating with the symbols that marks the cardinal characteristic of human thought and distinguishes it from animal response.[75]

In answering the puzzle of symbolic thought he took the explanation of Durkheim; that the binary concepts are part of human nature as men and women are alike in one sense and independent in another. So too, right and left are related yet opposite. Hence such natural pairs as exists in societies are invariably loaded with cultural significance and are designated 'good and bad', 'permitted and forbidden'. [41, 55] This is true of any society which consists of social beings living in relation to one another and these relationships are nurtured by communication, an act of exchange; exchange of words or articles, which communicate information for they are signs and not things in themselves. Primitive societies are especially characterized by 'living in relation' situations where the facilities for transport and communication are rare or do not exist. Thus most of the individuals spend their whole lives within a few miles of the locality where they are born in which circumstances most neighbors are biological kin. It is interesting to note that certain communities like the *Amish* choose to be under such restrictive conditions and hence qualify themselves to be well-integrated communities founded on interpersonal relationships though, of late they have developed a network of such closed communities.[77, 78] As in the analogy of a given language that denotes a total system of words, conventions and usages which any individual uses according to his wish; by the choice from the total system

of a language, certain grammatical conventions, tones and accents and by placing these in a particular order, he is able to transmit information by utterances; the designer too communicates by way of spatial forms and formats having defined structures. Both language and architecture are comprised of codes and elements of a culture that in turn represents the sum total of all its components which effect the vital communication responsible for building up and sustaining a society. The elements of a chain of culture are brought together as result of the rules of the language and not because they are similar in themselves, thus establishing the Syntagmatic chains instilling meaning in its receivers.(Table 4.1)

Table 4.1 System and Syntagm

System Language/Code, Parts of speech: nouns, verbs		Syntagm
Garment	Set of pieces, parts or details which cannot be worn at the same time on the same part of the body, and whose variation corresponds to a change in the meaning of the clothing: toque, bonnet, hood etc.	Juxtaposition in the same type of dress of different elements: skirt, blouse, jacket.
Food	Set of foodstuffs which have affinities or differences, within which one chooses a dish in view of a certain meaning: entrée, roast, sweet etc.	Real sequence of dishes chosen during a meal, the menu.
Furniture	Set of stylistic varieties of a single piece of furniture: Chair, Bed etc.	Juxtaposition of different pieces of furniture in the same space: bed, wardrobe, table etc.
Architecture	Variations in style of single element in a building: types of roof, balcony, hall etc.	Sequence of the details at the level of the whole building.

4.2.1 The difference

If the mathematical symbols remain emotionally neutral and exiting, architectural symbols are emotionally charged and are structurally related to the culture of which it is a product. This essential difference between the types of symbols is further established through the studies of its social use in colors primarily to communicate the significant distinctions of culture and then to signify objective differences of nature.[9, 74, 75, 79]

4.3 MYTHS

Though, in theological terms myth is a formulation of religious mystery; the expression of unobservable realities in terms of observable phenomena, anthropologically it is a 'sacred tale' capable of establishing mysterious connections between myth-logics and other logics. In mythologies, it is the western tendency to empty cultural signifiers belonging to a cultural order until they are fully separated from its original historic and social contexts.[80] Myths, though they are transmitted primarily by way of oral traditions that might undergo abbreviations and divorce from their original religious contexts, will still retain the essential structural characteristics they possessed in the first place which qualifies it as expressions of primitive, non-rational logic. Myth, similar to music and dream has certain common elements as in both cases; the end is implicit in the beginning. In myths certain basic oppositions are constantly being reiterated and combined into patterns. So too, as the repetitions and thematic variations of a musical score produce responses in its listeners in tune with his physiological rhythms, the repetitions and thematic variations of myth play on the physiological characteristics of brain to produce emotional and intellectual

effects.[31] Further, the individual understanding gained in many ways is personal for it is the receiver who decides what the message is. Thus, the use of myth to generate architectural forms also creates opportunities for the designer to be unique or stereotyped, maintaining the interdependence of logical structures and emotional responses. When this opportunity is used by the creative genius of the designer, it would generate expressions that are unique and exalting the inventiveness, yet falling within the structural system. These opportunities arise out of the fact that the worldly circumstances of human action are under no inevitable obligation to conform to the categories by which certain people perceive them. As the resultant effect, the system itself could more or less be altered which at its extreme, might end up as a transformation of which is begun as reproduction.[81]

4.4 METAPHORS

Over the evolutionary process, man has acquired the unique ability to communicate by means of language and signs and not simply by means of signals and triggered responses. Structural linguistics bases its formation theory of speech on the capacity of brain for marking plus or minus distinctions and treating pairs thus formed as related couples, manipulating relationships as in matrix algebra.

“Thus, the postulate that the human brain operates in much the same way when it uses nonverbal elements of culture to form a sign language and the ultimate rational system, the algebra itself, is an attribute of human brains everywhere” [75]

Metaphor in the normal sense suggests formal semantic, syntactic or pragmatic analysis.[82] The process of man becoming self conscious happens only when he is capable of employing metaphor as an instrument of contrast and comparison, is Rousseau's thesis as elucidated by Levi-Strauss. Imagining another world of supernatural beings represented as society of birds, fishes or even beings like men, is achieved by employing a metaphor that suggests strong similarity. Thus in a totemic culture, the superimposition of the whole set of myths lies in the discovery of paradigmatic-metaphoric patterns whose algebraic transformations shows what happens to men.[75] Metaphor, as signifiers of the non existent in physical form sediments life and enriches psychic functions, is universal in its ability to concretize, connect the unconnected and bridge the domains.[83] Thus, metaphor acquires creative value when concretized by a heart of culture that manifests creative ability as it transcends levels in order to remain in effective communication.

4.5 METONYMS

Metonyms rely on the fact that humans are aware of how a particular syntagm; *sentence*, is formed out of the elements of the system; *language or code*. It is able to recognize the whole by being shown only a part as in the case of the crown that stands for sovereignty, where the crown is uniquely associated with a particular Syntagmatic chain of items of clothing which represents an office so that even when located outside this context of proper use can still be used to signify the whole. Thus, metonym signifies that which is already 'out there' through continuity and it is context-bound. While, Metaphor; *system or paradigm*, relies on the recognition of similarity, Metonym; *syntagm*, relies on the recognition of contiguity.[84] *Syntagm* as

applied to an assemblage of nonverbal signs corresponds to sentence in a verbal language. Thus, 'queen bee is metaphoric' and 'crown is metonymic'.[75]

4.6 MUGHAL LANDSCAPE AS A SIGNIFYING SYSTEM

Ever since the creation of man, he has always longed to be in the midst of the cool of a garden that offered him tranquility and joy. Man, through his associations and soul exhilarating experiences with the natural landscapes is more than convinced of this one fact that if there is an expression of heaven on earth; it is the gracious, enchanting landscapes around him. No wonder, every recorded history of landscape is an account of man's earnest attempts to express his faith and understanding about the ultimate beauty, joy and peace; indeed to recreate heaven on earth through garden design. Throughout history men have tried to give expressions for the dreams of paradise as expressed in the texts of their respective religions, which is the case with the Mughals too.

Genesis 2:8 and the Lord God planted a garden in Eden; and there He put the man whom He had formed.[54]

The fact that man has enjoyed the landscape and longed to be in it, provides the evidence for the comfort and wellbeing offered by it in terms of physical, cultural and psychological conditions. Resource intensive landscape examples as manifest in the Persian gardens with the desert conditions where water supplies were won at great expenditure of energy establishes this fact.[85] Moreover, the landscapes of the past have always remained functional and meaningful to its makers and the culture that has structured and given shape to it.

...it is essential to understand what the constructed landscape meant to those who constructed and later lived in these...Landscape is a signifying system of great but unappreciated social and political importance.[9]

Mughal landscapes; the manifestation of the splendor of the Mughal emperors and the celebration of their romance is a perfect example for a culturally charged garden design that beckons even the genius of designers of all times. It is therefore, worthwhile to delve deep on the Mughal garden design principles in order to understand its symbol system and communicational value. Mughal landscapes have always remained successful from the temporal, cultural and performance point of view establishing its resilience and potential to be evolved further.

4.7 PARADISE METAPHOR IN MUGHAL LANDSCAPES

The word 'paradise' finds its root in the Old Persian word *pairidaeza* which refers to a walled garden. The kings of Persia were not only great warriors but great cultivators too, who took keen interest in building up their Paradise-style pleasure gardens, filled with all the finest natural elements and plants, wherever they founded their kingdoms. Geometrically laid out Mughal gardens which are fashioned based on the enclosed Persian water gardens, appeared alien to Indian environment and were an antithesis to their surrounding countryside. By way of the symbolic nature of gardens manifested in the concept of paradise as a garden; one of mankind's oldest ideals, one could trace its origins by working back to the Seventeenth Century through central Asia and Persia to ancient Mesopotamia.[10] The oldest Persian garden was built in 546 BC by Cyrus the Great at Pasargadae, which unified the official and residential

palaces. This symmetrically laid out garden that formed the prototype for the later ones manifests a mystical choice of flowers and the typical Persian love for metaphorical landscapes. It could be argued that the form of the Paradise Gardens evolved from the traditions of the early desert dwellers of the Near East on whom the religious symbolism had exerted a powerful influence. These influences include the reverence for water that induces varied feelings of 'life and death' through its movements and stillness, the choice for mythical trees and its symbolic potential to depict youthfulness and fertility, the cosmological division of the world into four by the four rivers of life and the significance of mountains. Yet, Mughal symbolism finds its meaning in the *Paradise Myth*; the vision of the Paradise as a garden described in the holy text which qualifies it to be a textual landscape.

4.7.1 Symbolism and the Paradise Myth

All throughout the history of mankind, one common idea shared by the different cultures is that of heaven as a peaceful, restful, beautiful, cool place of ultimate beauty and joy which they associated with the lush green gardens where they transcend their frail human condition; for the belief in myths promotes happier lives. The mythical world of symbols speaks for itself which is therefore, capable of revealing a modality of the real or a condition of the world which is not evident in the plane of immediate experience. Symbols and symbolism having their genesis in religion is found effective in pointing a world order and in its multivalence expression several mythical meanings perfectly fitting into the system are projected. They have a unique capacity for expressing paradoxical situations which always point to a reality or a situation concerning human experience.[86] Mythical paradise, through its image

as a '*place of plentitude and perfect peace*', transforms the burdensome temporal human existence to one more meaningful and its transitory nature made acceptable.

The first evidence of paradise myth could be found in the Assyrian ivory plate where the mountain with the water god is seen flanked by trees and adorned with sun symbol; a depiction of the *Dilmun*; a paradise of the gods with fruit trees, green fields and meadows. Later, in the period of Gilgamesh, the ruler of the Sumerian city state of Erech (*Warka, Iraq*), became the hero of the collected myths of the Akkadians and Babylonians in the Twenty-seventh Century BC. Many of these myths acquired themes of death, immortality and hope of eternal return. Paradise was projected as the eternal reward; *the abode of peace and plentitude*, reserved for those who are favored by gods and achieve immortality. It is assumed that the *Epic of Gilgamesh* was known to the Jews who were released from captivity by King Cyrus in 538 BC and with the translation of the Old Testament, the word *paradeisos* meaning garden, became identified with the *Garden of Eden*. The paradise as described in Koran, consists of several terraces, each more splendid than the preceding one and were meant to correspond to the enclosures of the mythical Paradise gardens.

The Persian history and the history of their gardens find its genesis with Achaemenians of 540-450 BC who are considered the greatest gardeners of the ancient world.[10] In Persian traditions, their gardens were not exclusively connected to aristocracy. Therefore, gardens could be found attached to homes as evidenced in the immutable *Old Iranian houses* known for their grim outer walls with its garden and court within. The Moorish example of the *Court of Lions* in Alhambra depicts a

classic example of a Persian palace garden with a crossed watercourse and four plots which originally contained aromatic flowers and plants.(Figure 4.5) The court also has a central sculptural water basin supported by lion images that are forbidden in Islam. The arcaded court surrounding the Court of Lions could be viewed as an influence of cloistered medieval monasteries which derive its form from the peristyle of Roman villas as they occasionally referred Monastery gardens and cemeteries as Paradise. Paradoxically, Persian gardens symbolized mortality and eternity and have appealed to the curiosity of religious mystics; the Sufis, who found the parallelism between physical and spiritual in effecting spatial communication.



Figure 4.5 *Court of the lions*- Alhambra, Spain

They, by their imaginative and poetical mind were fond of discovering analogies between different aspects of creation, even to the relationship between man and nature and the relationship between the behavior of man and the state of the garden, as seasons symbolizes man's resurrection when the dead earth is adorned with lovely green sprouts and flowers; a *depiction of the dead bones on the doomsday*. Though, it is reasonable to assume that the form and design of the Mughal gardens

could be influenced by the cultures with which it had to interact, essentially it remained true to its model from the Persian Gardens that largely draws its form from their religious text.

4.7.2 Symbolism of Water and Trees

Water is seen as the life giving and life sustaining element in a hot arid land and it has played a crucial role in controlling the lives of the people of Near East, where they settled in the fertile lands between Euphrates and Tigris.(Figure 4.6) Therefore, water is ascribed a divine position in the early agrarian communities for it commanded their adoration and worship. Trees and plants are chosen to signify life and fertility for its vital role in sustaining life.

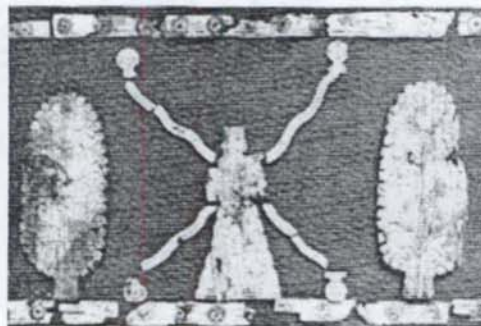


Figure 4.6 *Ivory plate, Assur ca 1243-1207 BC.* Mountain with water god flanked by trees and decorated with sun symbol. Flowing vases symbolize the four rivers of life.

Early Sumerian tablets unearthed, often illustrated the exalted position of trees. The mythical trees thus commanded worship of men and have often represented regeneration, immortality, and knowledge. The most favored *Moon Tree* of the Persians is thought to be a conifer and the *Cypress* trees are therefore, used to depict immortality in Persian and Mughal gardens.(Figure 4.7) The avenues of such *Cypress*

trees, planted on the borders of watercourses, are often used to divide the garden into mythical plots in their efforts to establish romantic and symbolic Paradise.(Figure 4.8)



Figure 4.7 *Prophets Tree*
in paradise



Figure 4.8 *Love scene*
Evoking landscapes served the
setting for romance

4.7.3 Taj Mahal

Taj Mahal is built by the fifth Mughal emperor, Shah Jahan in the year 1643, as a marble sculptural tomb and a tribute to his Love, Mumtaz Mahal. Located in the city of Agra, on the banks of Yamuna River, the fabled Taj Mahal; one of the wonders of the world, succeeds in its efforts to stimulate its beholder's eye.(Figure 4.9) The successful Taj garden with its sculpture; the tomb, is fashioned after the Paradise Myth, closely follows the formal, geometric design principles based on Koran.[87](Figure 4.10) Taj Mahal has remained an inspiration for more than three hundred and sixty years and the most extravagant of romantic notions that has overcome the pressing challenges associated with a historic landscape. Taj garden is accessed through the main gateway; a massive portal that opens to the south. Symbolically, the detached gateway is a traditional feature of Muslim architecture that marks entry and transition between the outer world of senses and inner world of the spirit.(Figure 4.11) Almost 200 feet high, the tomb is seated on its square white marble platform which in turn rests on a rectangular base of red sandstone. The gate house

forms the center piece of a broad forecourt with numerous rooms for tomb attendants and two small elevated royal tomb gardens. Just west of the walled Taj Mahal complex is located an aqueduct and water works; now in ruins, which drew water from river Yamuna to fill the channels that supply the fountains and irrigate the gardens. To the south of this spreads a former bazaar, also in four quadrants, known as *Taj Ganj* which today sustains a thriving tourist trade; an antithesis to the tranquility of the garden within the massive walls. Every element of this garden is carefully chosen to evoke signification to the unseen world described in Koran; be it trees, flower bed, terraces or water qualifying it as a fine metaphorical landscape.(Figure 4:12)

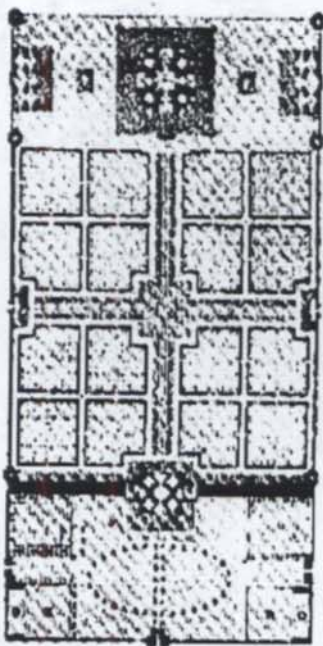


Figure 4.10 Plan
Taj gardens

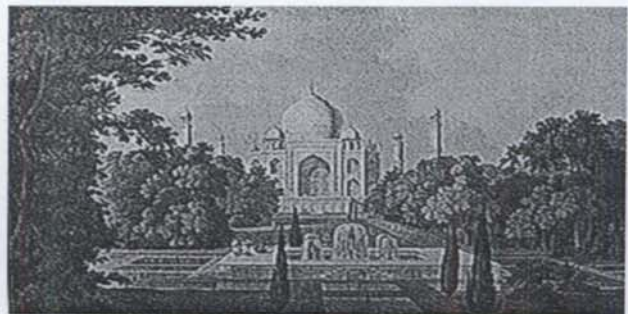


Figure 4.9 *Taj at night*
An inspiring romantic monument



Figure 4.11 *Main Gate way*

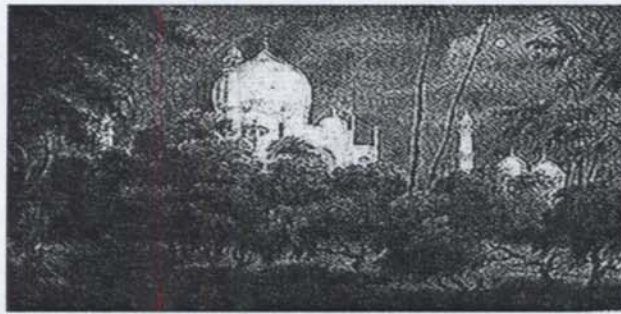


Figure 4.12 The romantic, *moonlit Taj...*

4.7.4 Rashtrapati Bhavan Gardens

Rashtrapati Bhavan, the official residence of the President of India, is located in the Presidential Estate, at the west end of the 2.5km long Rajpath; a tree-lined avenue flanked by lawns, orderly flowerbeds and clipped hedges and the India gate at the opposite end. This palatial building on the Raisina hill; Designed by Sir Edwin L. Lutyens and completed in 1929, served as the Vice regal Lodge during the British rule. Rashtrapati Bhavan is a magnificent classical structure showing off British imperialism with massive columns, verandahs, balconies incorporated with typical Indian motifs resulting into a masterpiece of symmetry and harmony.(Figure 4.13,14)



Figure 4.13 *Rashtrapati Bhavan Gardens...* blend of the English with the Mughal



Figure 4.14 *Rashtrapati Bhavan Gardens*
A view from south



Figure 4.15 *The Gardens*; View from east and central lawn

The elegant Mughal Gardens is located to the west of Rashtrapati Bhavan and is designed by Lutyens. The garden which occupies thirteen acres is divided into three sections; rectangular, long and circular gardens, and is often described as a blend of formal Mughal style with English style. The symmetric garden with symbolic canals, fountains and terraces with flowering shrubs and western style lawns, hedges and flower beds is a visual treat especially during the blossoming season.(Figure 4.15) Conceived in tune with Mughal garden design principles, it evokes eloquent images of the paradise myth that lie behind its making.

4.7.5 Comparison of Mughal Gardens

A comparative study of Mughal gardens brings out the general design considerations and symbolism evolved over the ages. All the gardens examined follow the formal design principles of symmetry, axuality, balance of layout and use of symbolic *Char Bagh* and strong centrality induced through sculpture, building or

tomb.(Table 4.2) Circular garden in the Rashtrapati gardens is an intentional adaptation to the integrated architectural grammar evolved for New Delhi by the Architect.

Though, water is used in various forms in these gardens, they have shown great sensitivity to its effective use in landscapes for it is an item of scarcity, thereby, manifesting responsibility for the use and management of natural resources as God given blessing for all. Moreover, the techniques like *Chadar* and fountains employed by Mughals performed effectively in cooling down the interior air. They very well understood and applied the mirroring quality of water to create depth and interesting illusions in landscape. The night-time use of landscape as observed in Shalamar gardens with the spectacular display of water effects remains a novel idea which finds its place even in the contemporary landscape scenario. It is interesting to note that the kings used these great garden settings not only for their pleasure, but also for receiving guests and feeding the poor, thus the gardens tend to fulfill its social role too. Religious symbolism found meaningful expressions in these gardens, also Rashtrapati gardens assume the larger roles ascribed by democracy. The symbolic motifs employed in the gardens underwent regional adaptations over the period of time and thus it remained resilient and adaptive to the changing contexts.

It is of no doubt that the Mughal gardens which represent an extraordinary synthesis of human concerns stand out among the landscape traditions of the world. Though the origins of Mughal gardens can be traced to central Asia, it reached its climax in India during the reign of the Mughals where it is found practiced by the kings, nobles and elites. Many of these gardens though, upheld the paradise metaphor,

also responded appropriately to their local cultural, geographical and environmental contexts. The success of these gardens lies in the integration of the finest features of natural and built environments with the traditions of local and regional landscape designs. While they draw together human aspirations for worldly and spiritual order and synthesized the aesthetic and functional needs of the society; also provided an ideal context and setting for the performance of poetic, artistic expressions and also for the celebration of beauty and romance; the love that transcends.

Table 4.2 Comparison of Mughal gardens

Nature/Principles	Taj garden	Shalamar garden	Rashtrapati gardens
Paradise metaphor	Yes	Yes	Yes, with appropriate adaptations
Axiality	Yes	Yes	Yes
Symmetry	Yes	Yes	Yes
Use of central focus	Tomb	Pool of water	Central lawn
Char Bagh Concept	Yes	Yes	Mostly, except for the herbal garden
Rectilinear gardens	Yes	Yes	Yes
Circular gardens	No	No	Circular garden is introduced
Extended nighttime use	No evidence	Extended use	Extended use
Use for social events	Yes	Yes	Yes, adapted to the democratic roles
Climate modification	Yes	Yes	Yes
Scale and symbolism	Modest	Modest	Modest

The Mughal gardens are never *sui generis* and have always been influenced by garden designs of other regions and times as evidenced from the above case studies.

Examples of regional influences could be traced in the designs of Jahangir's Tomb-garden and Lahore Fort.[88] Mughal gardens have always integrated the wisdom of designers and wise men alike and remained an inspiration for architects in all times. The shift in paradigm of garden design due to changes in cultural, economical and political changes that has taken place over the period of time, make it imperative for the adaptation of Mughal Gardens to suit today's Indian cultural landscape. Further it establishes that the needs of Indian society combined with the limitations of its scarce resources could be transformed to generate symbolic landscapes that evoke vivid images of an unseen world in an effort to sustain hope.

Mughal landscapes are also successful symbolic manifestations of its culture and systems described in its holy text. Yet, these designs are acceptable from the functional and economical considerations. No design could mean anything for its users unless they could own and operate it successfully. This is especially true in a resource scarce country where creativity means uniqueness with economical efficiency, not the embellished expressions even in creation of the landscapes. Moreover, the Indian view of landscape is more utilitarian and cosmological than merely being an aesthetical feast to the eye. Thus, in the Indian context, a tree or grove of trees makes more sense culturally and ecologically than soft turf. It attempts to relieve landscapes from being the '*viewed or picturesque*' to one of participation and appreciation by its users. Such functional landscapes of India are marked for their relevance and vibrancy of life.[89]

Man, throughout the history has given expression to his ideas of beauty and order, even its highest expression; the Paradise, through the landscape designs. The ideas of beauty and order take its birth from the respective religions having cosmological basis as evidenced in the Mughal gardens. Since the Paradise myth is derived from Koran, the Mughal landscape qualifies itself to be a textual landscape where the practice of symbolism is inevitable. The fabulous Mughal gardens, in spite of their artistic, cultural and romantic roles are also successful in the performance of social roles too, thereby, establishing its wide-ranging flexibility. Further, they have remained resilient and adaptive to the changing contexts and cultures over the times. The shift in the paradigm of garden design due to cultural, economical and political changes that has taken place over the period of time necessitate adaptations in Mughal gardens and make it relevant for today's world. Though the designers in the past decades have tried to interpret the Mughal landscape traditions in a way appropriate to the modern context a fresh semiotic approach to reinterpret its traditions and practices will benefit the modern society. The study thus, establishes that religion with its text and culture with its systems are the primary sources of symbols which provide the basis for symbolism in architecture. Further, studies on the development of graphic communication would facilitate the development of graphic equivalents and tools for communication in architecture as elucidated in the following Chapter.

5.0 DEVELOPMENT OF GRAPHIC COMMUNICATION

Graphic communication in its widest sense has a long history which traces its beginning to the early man who hunted for food and spotted in mud the imprint of the game that deciphers the relevant information.(Figure 5.1) While he looked at the graphic sign; the imprint of the game, his mind's eye saw the animal itself, establishing the '*signifier-signified*' relationships.(Figure 5.2,3) The representational power of symbols found extended use in Egyptian hieroglyphics by the application of *rebus principle*. [90]



Figure 5.1 *Pug mark of Leopard*



Figure 5.2 *Beware of wild animals.*
British Road sign

Symbols as graphics are essentially pictures; real or imagined, those are the forerunners of consciously articulated speech which include signs, like the letters of alphabet; *Typographic*, or individual graphics that forms part of another system of signs as in traffic signage. Symbols are found used in communication prior to speech

and the 'symbolic' was indeed generally human, yet considered primitive; for it is characteristic of the basic human nature. Images are formed when graphic marks of any composition like lines or dots work in relation to one another. Images evolved through Graphic design and arranged appropriately on any surface, communicate an idea or information. Sometimes, by rebus principle words and syllables are represented by pictures of objects or symbols whose names are similar to the word or syllable to be communicated. [90](Figure 5.4)



Figure 5.3 *Cave paintings from Lascaux*
c. 15000-1000 B.C



Figure 5.4 *Egyptian hieroglyphics*
illustrating 'rebus principle'

While sign is not a picture, not every sign also can be considered a symbol. Symbolic graphic images are always descriptive illustrations of things seen or imagined. Context of signs give them unique meaning and their positioning impart new significance. Though, words and images could be used together, in which case either text or image dominates or each has its meaning determined by the other. Some of the most sophisticated examples of graphic design have relied on the precision of words to impart exact meaning to ambiguous images. When printed, word as a form of recorded speech, loses a whole range of expressions. Contemporary graphic designers have tried to break this limitation and their works give 'voice' to

typographic expressions through their size, weight and position of the letters.[3] Indeed the urge to do more than merely convey a message and to give it a unique character, is instinctive. Context of the graphics also determines the meaning of the design and instructs the receptor 'how the graphics is to be read'. One of the best-known modern graphic designs; '*I love New York*', a mixture of pictogram and alphabetic signs, depends heavily for its message on an agreed understanding of meaning and convention.(Fig. 5.5) We recognize the image in Figures 5.5 and 5.6 as a heart because that is how hearts are represented for the understanding of the collective body of the receptors. On the contrary, if presented with a 'text book diagram of heart' instead of the reduced graphical representation for heart; the heart loses its metaphoric signification for love; thus loses its symbolic value.



Figure 5.5 *Promotional Logo:*
New York State, Department of Commerce



Figure 5.6 *Kaffee Hag* looks after your heart.
Heart drug advertisement, 1920 and *National Blood Transfusion Service* symbol, 1948

The meaning that images and alphabetic signs decipher has little to do with 'who designed them' as they do not express their designer's ideas, but the common idea of a collective body of receptors. Further, the designer's message serves the expressed needs of the client; his principles, values and preferences. Although its form may be determined or modified by the designer's aesthetic preferences or prejudice, the message has to be put in a language recognized and understood by its

intended receptors which illustrates the primary difference between graphic design and art.[3, 90] Secondly, unlike an artist graphic designer plans for a mechanical production which necessitates commencing of designs as rough layouts on paper or on a computer screen.(Figure 5.7) Once commissioned the graphic designer often acts as an ‘Art Director’ who discusses proposals with the client and these are often revised in several stages with necessary instructions for production.

Graphic design acquired the status of a profession since the middle of the twentieth century, until then advertisers used the services provided by commercial artists who are specialist visualizers, typographers who engaged in detailed planning of ‘*headline and text*’ and gave instructions for typesetting. Also included in this category are retouchers; lettering artists and others who prepared finished designs for reproduction. While commercial artists such as poster designers combined several of these skills, graphic design has also overlapped the work of the agencies and studios and now it embraces not only advertisements, but also the design of the magazines and newspapers. Thus, the lone graphic designer of yester times has become part of a team in the communications industry; the world of advertising, magazine and newspaper publishing, marketing and public relations.

Until late Nineteenth Century graphics were essentially black and white, printed on paper. The relationship of ‘figure to background’; the inked to the non-inked, positive to negative space, are crucial to the establishment of good aesthetics. Since the background which is mostly paper that provides physical support to the images and signs, the content had to be laid out to be sequentially viewed; as the

paper unfolds. Graphic designers of the west generally adopted the *Roman alphabet*; historic and almost immutable, though they used different versions of the historic prototype. All these were based on letters made in ink by the scribes, reflecting their design considerations such as geometry, symmetry and proportion.(Figure 5.8)

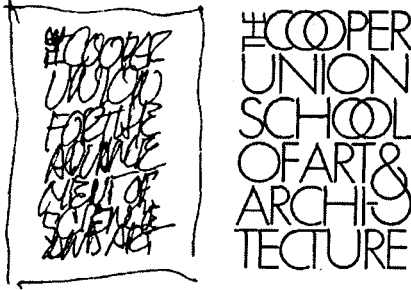


Figure 5.7 **Development:** Rough sketch to Logotype, 1960

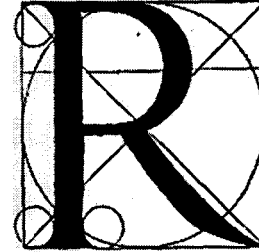


Figure 5.8 **Construction of letter 'R':** Graphic image is based on the ink-letter of the scribes, later developed and expressed geometrically. Venice 1509

Over several centuries, the three basic functions of graphics have remained unchanged. Primary role of graphic design is of identification: to say *what something is*, or *where it came from* like inn signs, banners and shields, masons marks, publishers' and printers' symbols, company logos, labels on packaging.(Figure 5.9-12)



Figure 5.9 **Identification**
Tabard, shield and plumed helmet
of Bertrand du Guesclin,
constable of France 1487



Figure 5.10
Identification
Jaguar Cars



Figure 5.11 Tata Motor Company

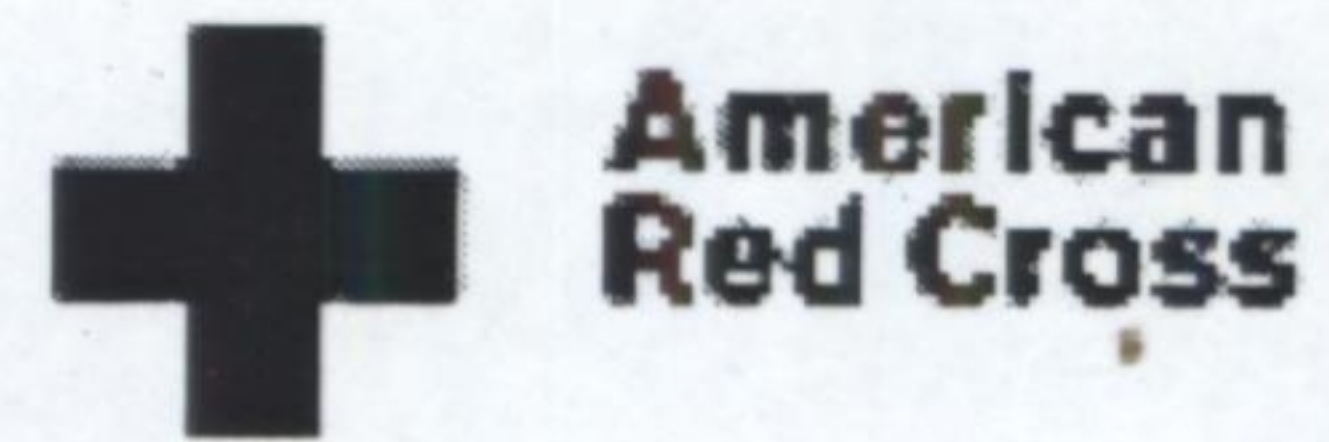


Figure 5.12 American Red Cross

Its second function known in the profession as *Information Design*, is for information and instruction, indicating the relationship of one thing to another in direction, position and scale as in 'maps, diagrams, directional signs'.(Figure 5.13,14) Distinct is the third function of presentation and promotion since it makes the message memorable through posters and advertisements.[3](Figure 5.15,16)

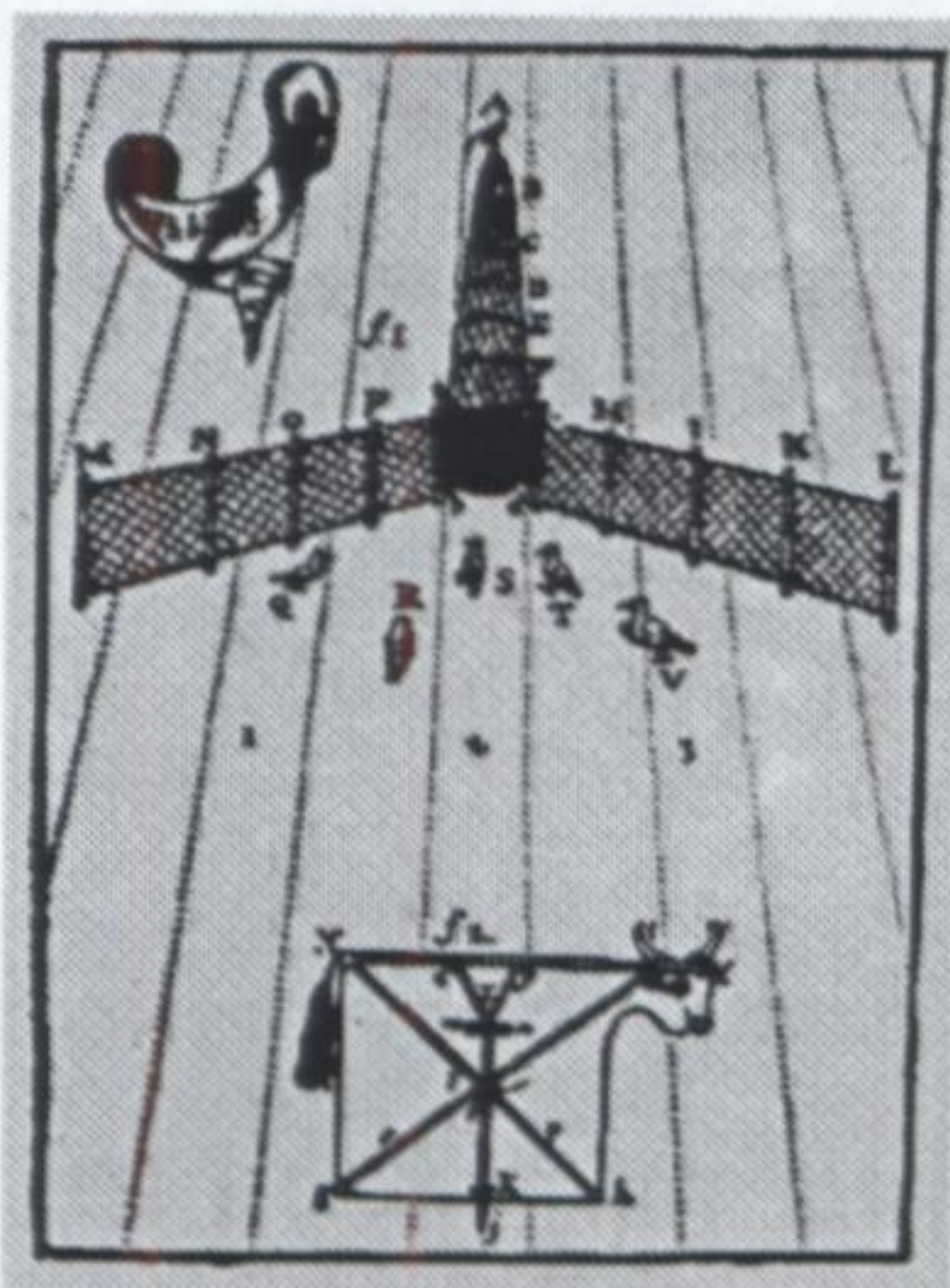


Figure 5.13 *Information and Instruction*
How to trap birds, Paris 1660

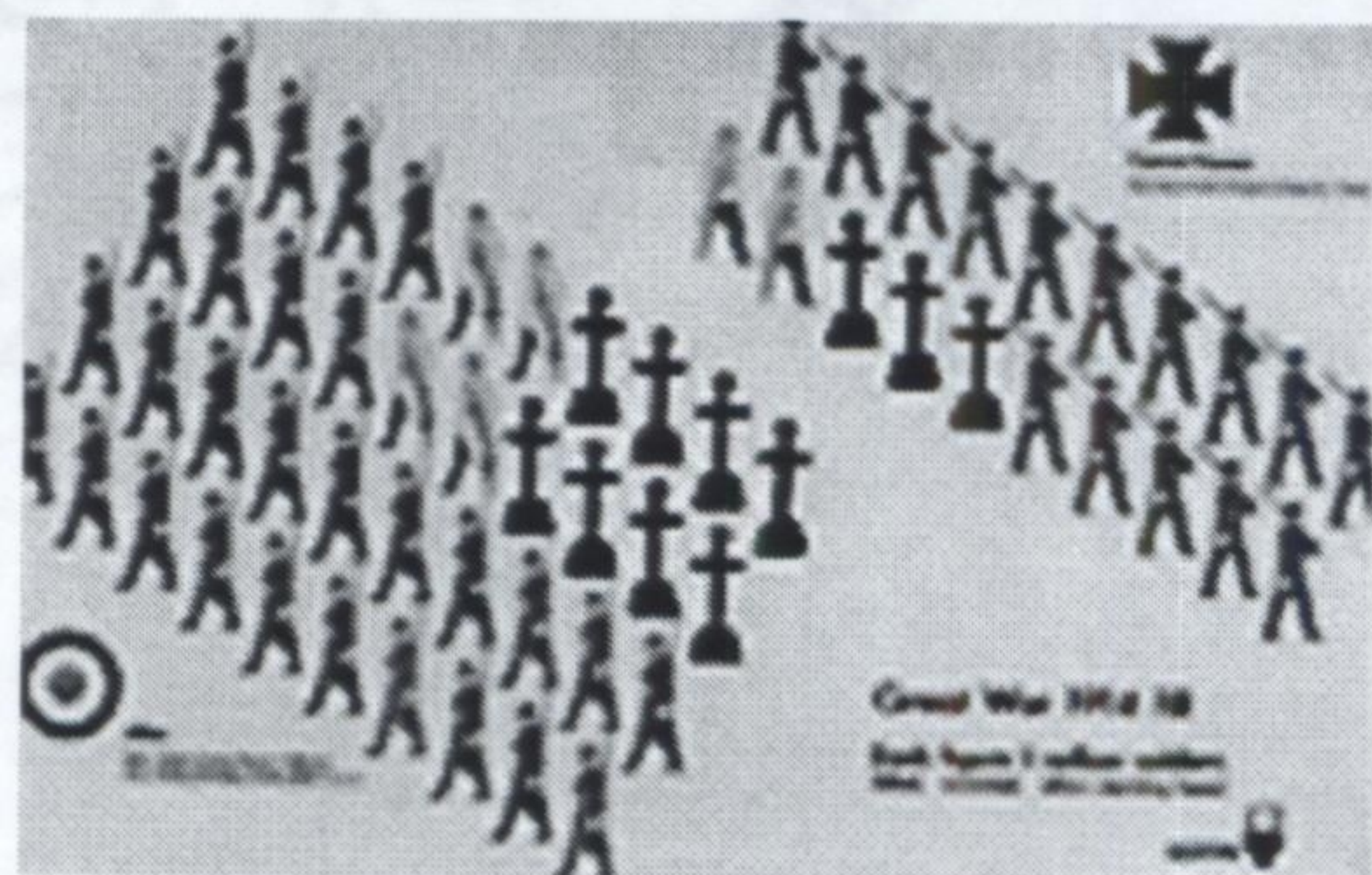


Figure 5.14 *Isotype Chart, Information*
Causalities in the Great War 1914-18. Otto Neurath, Gerd Arntz and Marie Reidemeister-Neurath 1933.



Figure 5.15 *Presentation and Promotion*
Globeol Tonic Advertisement, 1912



Figure 5.16 Mac computers world network

Attempts to standardize graphic symbols for communication world-over had its inception in *Isotype* studios where group practice was preferred and teams of designers were responsible for collecting data, organizing it and designing standardized symbols; *Isotypes*. Standardization made its imprint in graphic design through the works of *Otto Neurath* who pioneered the Viennese *Isotype*; *International System of Typographic and Pictorial Education*, in 1920, a convention of signs in graphic usage.[3, 90] Two basic rules of *Isotype* are that ‘*a greater number should be represented by a greater number of signs*’, not by a single larger sign and second; ‘*the presentation is made free of perspective effect, where distance-representation would require signs to be smaller*’ which would ultimately confuse the recipient and lower its efficiency of communication.

Design is seen as solving problems of communication in 1960s’ during which period graphic designers responded to fashion, since it was ‘visual’ and concerned with ‘good taste’. Various other factors such as developments in technology, media and society influenced developments in graphic design. Interestingly academics also responded to graphic communication since it has verbal and social connotations. In 1958, Canadian Marshall McLuhan, brought out his dictum “*the medium is the message*”, based on his studies and analysis of posters and contented that ‘*societies have always been shaped more by the nature of the media by which men communicate than by the content of the communication*’. Moreover, the state-controlled communications and advertisements of Cuba and other socialist countries played a vital role in the introduction of mass public to what was formerly an elite culture by assigning an important role of social transformation on their graphic communications.

Graphic design is now a distinguishing part of the culture and economy of the industrialized countries. However, despite the progress in technology since 1960s by allowing messages to be '*bounced off orbiting satellites*' and giving shared access to images, developments are still surprisingly localized. Though most designers work as part of a team, change is still associated with individual pioneers.

New forms are nurtured in response to commercial pressures and changing technology, yet graphic design continues to feed on its own traditions. Although many images are created by designers themselves, many more are ready-made like the old woodblocks re-used by medieval printers from earlier jobs, old engravings or stock photographs. Electronic revolution enables the storage, recycle and manipulation of images for generating contemporary designs.

5.1 UPCOMING OF POSTERS

Graphic design constitutes a kind of language with an uncertain grammar and a continuously expanding vocabulary. The imprecise nature of its rules means that Graphic Design could be more studied, than learnt. Poster as a single sheet unfolds with printing only on one side is the simplest medium of graphic design. It exemplifies the essential elements; *alphabet and image*, and its means of reproduction. Later, poster designs proved that contrary to the earlier understanding 'graphics and words' worked well in deciphering meanings. Since 1900s, poster designs had been produced as post cards, enamel designs and perforated adhesive labels, like postage stamps that emphasized economy in its design and production. Stanley Morrison of Britain who designed the *Times New Roman* upheld the *practical*

criteria, uniqueness and novelty in making typography which is accidentally-aesthetic in the end.(Figure 5.17) Lettering functions like label in posters; less to identify the image than to justify its presence. Tom Purvis, a prolific poster designer furthered a style of 'flat color with no graded tones' for easy production and use of unprinted white paper as one of the colours.(Figure 5.19,20) However, it is Henry Beck's design for the London Transport Map that used a standard octagonal grid where the lines met at right angles or at 45 degrees with the positioning of stations to depict their relationship within the system rather than actual distances from each other.(Figure 5.18) With Thames River winding across the lower half of the diagram, it acquires a sense of place and occupies a key place in the history of graphic design.



Figure 5.17 *The Times*
Mastheads, 1932, Stanley Morison

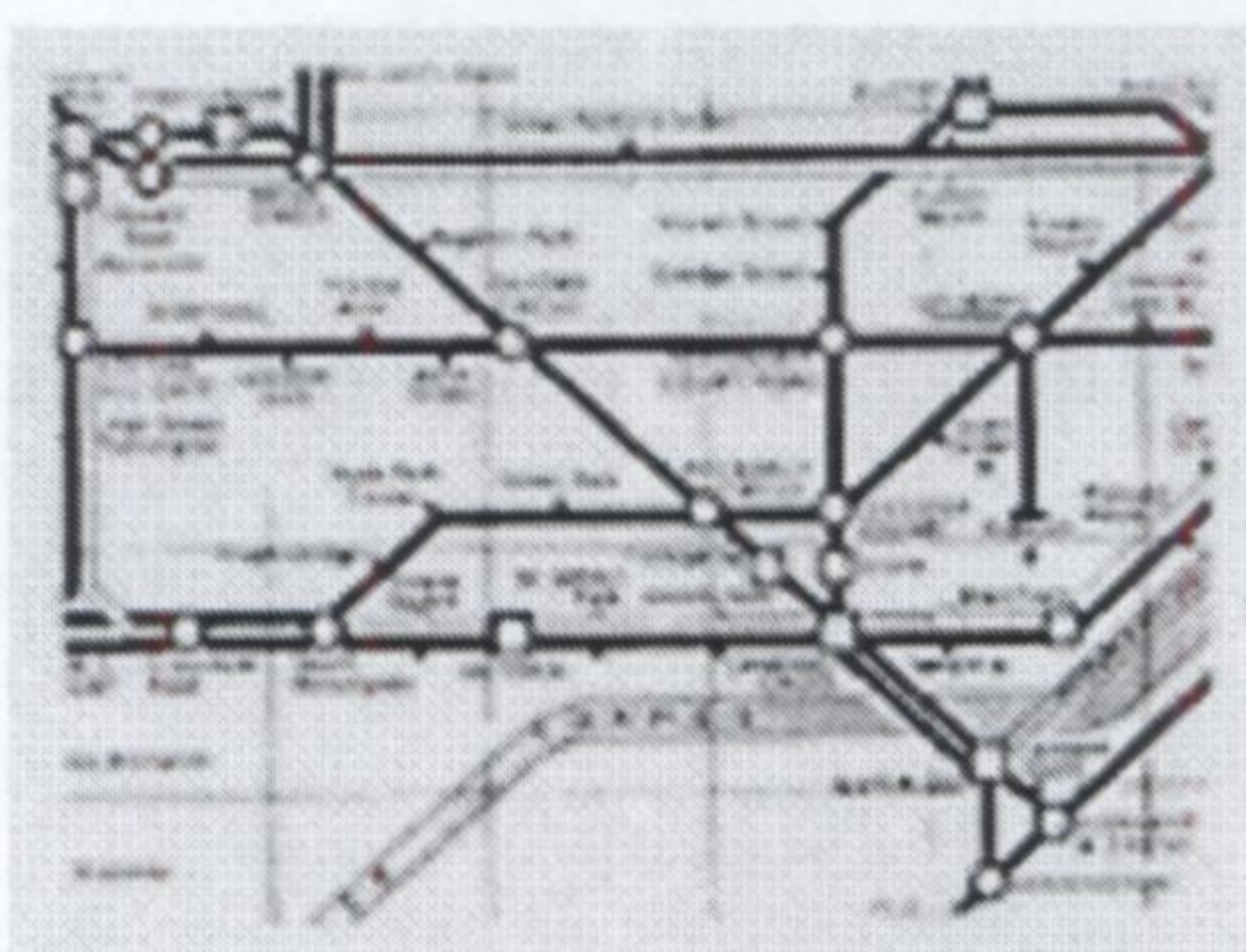


Figure 5.18 *London underground map*, Henry Beck 1960



Figure 5.19 *East Coast Travel poster* 1935
Tom Purvis



Figure 5.20 *Imperial Airways Symbol*, 1934,
Theyre Lee-Elliot

A group of designers in Berlin, associated with the printing firm *Hollerbaum and Schmidt* evolved a style; '*Sachplakt*'- object poster; by convergence of poster to

image of the object being advertised.(Figure 5.21,22) The *object poster* presented the object with unambiguous graphic simplicity as the lettering; a close derivative of the rebus principle. Though object posters coexist with contemporary commercial posters and like advertisements, they deploy slogans using words which have a significant place in graphic design only when it serves a single visual concept.



Figure 5.21 *Manolicigarettes*
Poster 1912, Lucian Bernhard



Figure 5.22 *Opel Automobiles*
Poster 1911, H.R. Erdt

5.2 MILITARY, WAR AND ITS INFLUENCE

First World War established the importance of visual design as diagrams, illustrations and captions helped to inform and instruct. Signs and symbols of military identification of rank assumed a code of status that is instantly understood. The regimental badge with its motto and powerful images and posters consisting of such were called into service by governments for public announcements, propaganda and to solicit its citizens to share in war efforts.[3, 90] The virtues of the '*Sachplakt*'; simple images in flat colour, solid shadows with consistently well-drawn lettering in a dense texture, made the war propaganda effective.(Figure 5.23) German designers displayed mastery in combining various representations in a single clear idea as exemplified in the poster by *Gipkens* where a silhouetted black-eagle signifying the

Germans, perched on the bullet-holed rounded marking of an Allied plane communicating the message in a complex manner.(Figure 5.24) The bullet holes signify German victory and the eagle while its outline is realistic, is a symbol and the identification mark which it grasps is a hybrid; both a drawing of the mark and the mark itself. Posters are a major means used by civilized states to persuade its citizens in subscribing to war loans as in the case of *Liberty Bonds*; Hun – his mark in ‘*Blot it out with Liberty Bonds*’.(Figure 5.25) Austrian poster designed by Julius Klinger depicting the figure ‘8’ of the eighth war loan as a trap for the Allies represented with a black and green dragon with its head and neck transfixing by a succession of seven arrows, each for a preceding war loan.(Figure 5.26)



Figure 5.23 *I want you for US Army*,
Poster 1917,
James Montgomery Flagg



Figure 5.24 *Exhibition of works of German internees* Poster 1918,
Ludwig Hohlwein



Figure 5.25 *The Hun- His mark* Poster 1917,
J. Allen St John



Figure 5.26 *Eighth War Loan* Poster 1918,
Julius Klinger

Many characteristics and elements of graphic design appeared in the war since the military needed systems of signs for organizing, identifying its personal and supplies, and clear manuals of instruction for their deployment and use.(Figure 5.27) Even the hierarchy of command and authority was marked by badges of rank; a system of signs that had to be learnt. Efficiency to *camouflage and identification* was enhanced by the application of the principles developed in Gestalt psychology as in the redesign of US aircraft identity by modifying its circular emphasis to avoid confusion with red Japanese insignia.(Figure 5.28) Moreover, the development of Information Design was promoted by the 'wartime pressures' which required rapid understanding of facts for making decisions especially with the use of motorized transport that needs quick identification units by corps and divisions.



Figure 5.27 *Office of Civilian Defense Insignia*
c.1942, Charles Coiner

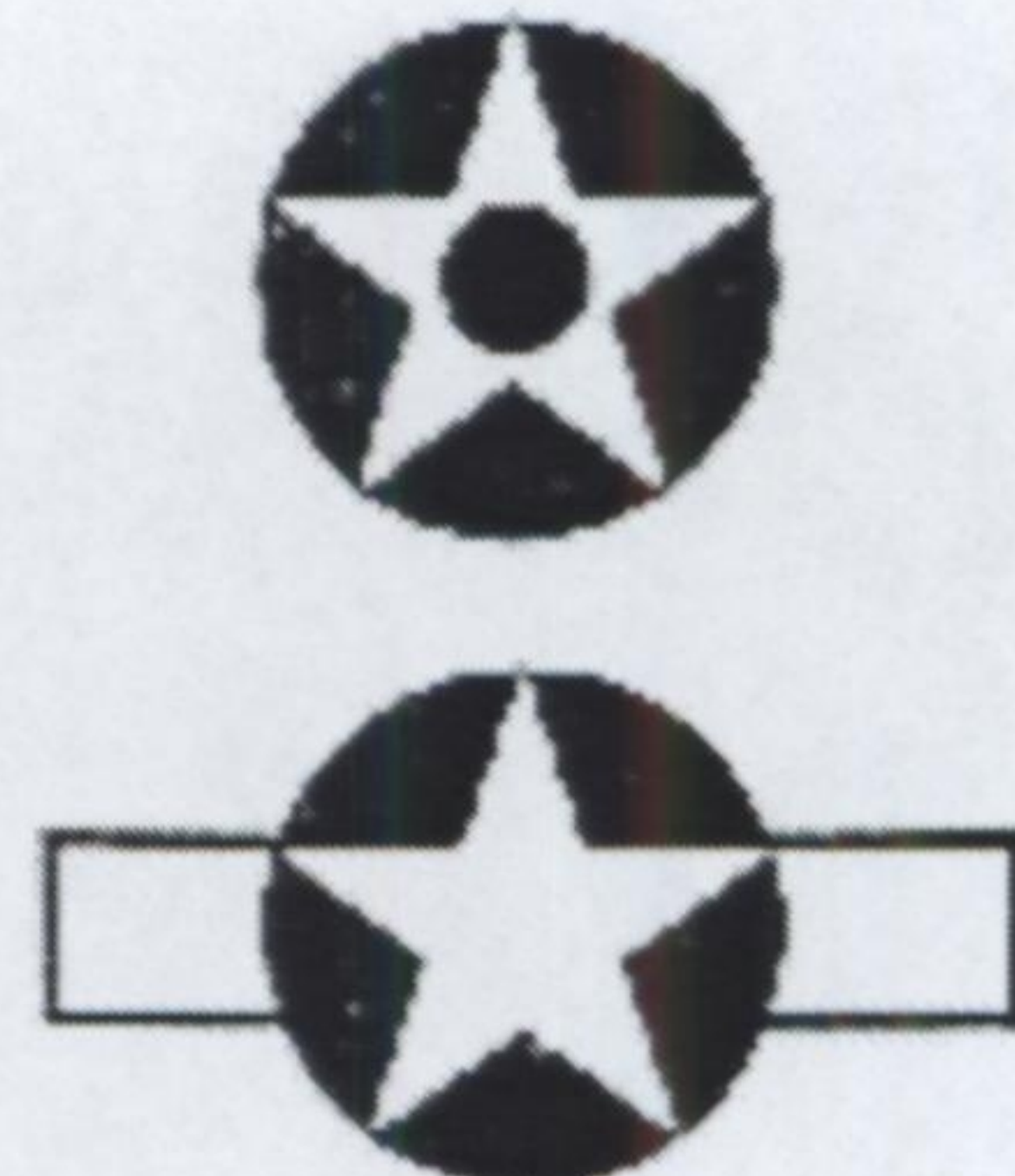


Figure 5.28 *US aircraft marking*
Before and after 1943

War posters, on the other extreme, produced stereotypes that are used for political propaganda in the turbulent years that followed in Italy, Russia and Germany. National aspirations that are focused on wartime leaders now turned Marx, Lenin and the other Fascist dictators into icons of the enemy pictured as barbarians or ravenous beasts, symbolizing evil and horrors of Bolshevism or capitalism.

5.3 TRADEMARKS AND ITS CONTRIBUTION TO GRAPHIC DESIGN

It is with the introduction of 'house style'; a series of rules requiring consistent treatment to all elements within an organization, that trade marks as signifiers of company ideals became widely accepted. The central feature of trade mark is an emblem with or without the company name, which was always in the same *logotype*. Ladislav Sutnar, art director of Sweet's catalogue service since 1941, defined the function of design as '*resolving the conflict in polarizing a design need into function and form, content and format, utility and beauty or the rational and irrational*'. [3] (Figure 5.29) His work on catalogues obliged him to deal with trademarks and the standardization of graphics in US. In 1956, along with Paul Rand, he brought out the best known design for IBM. (Figure 5.30)

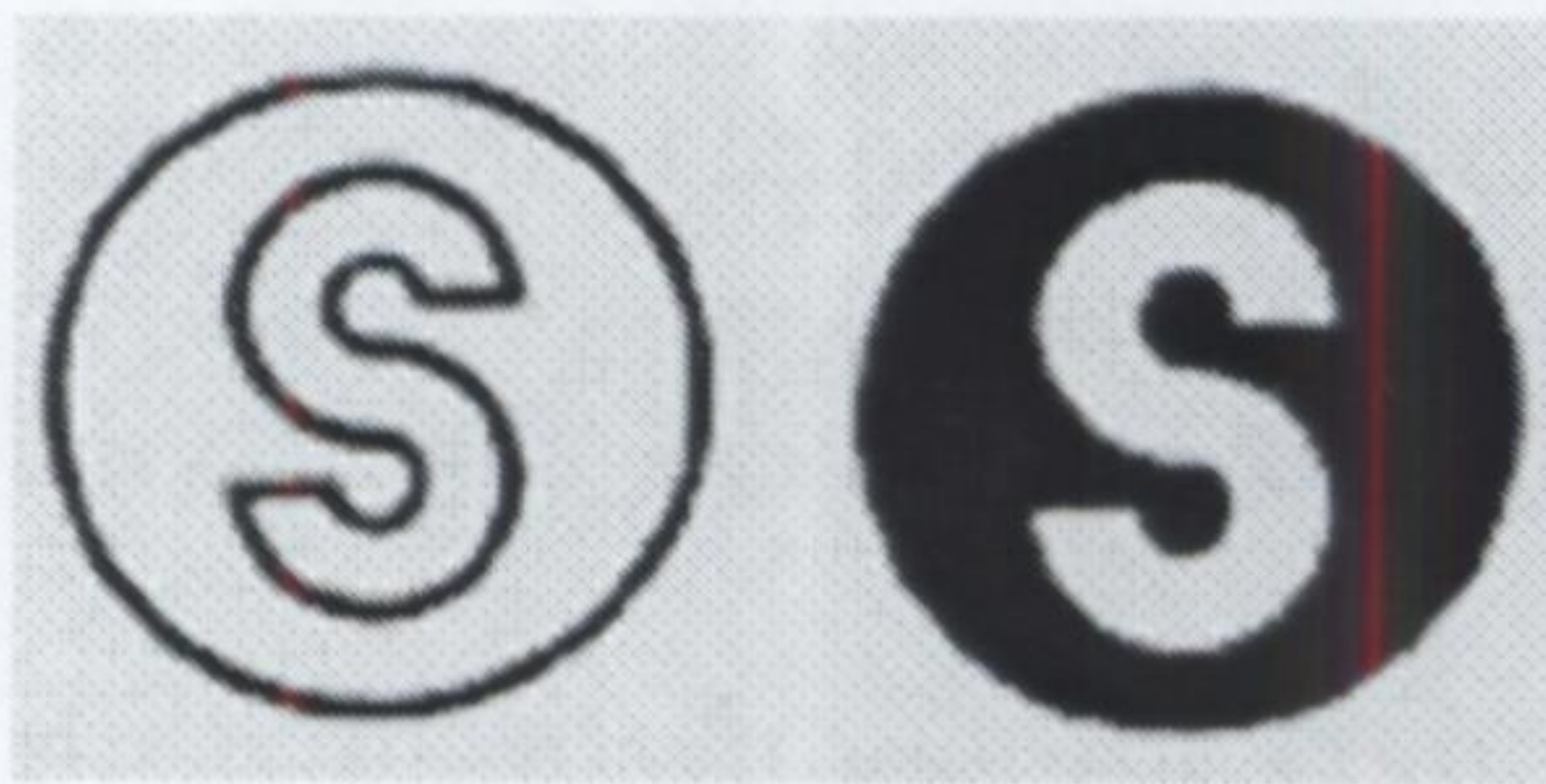


Figure 5.29 *Sweet's Catalogue Service Symbols, 1950*
Ladislav Sutnar

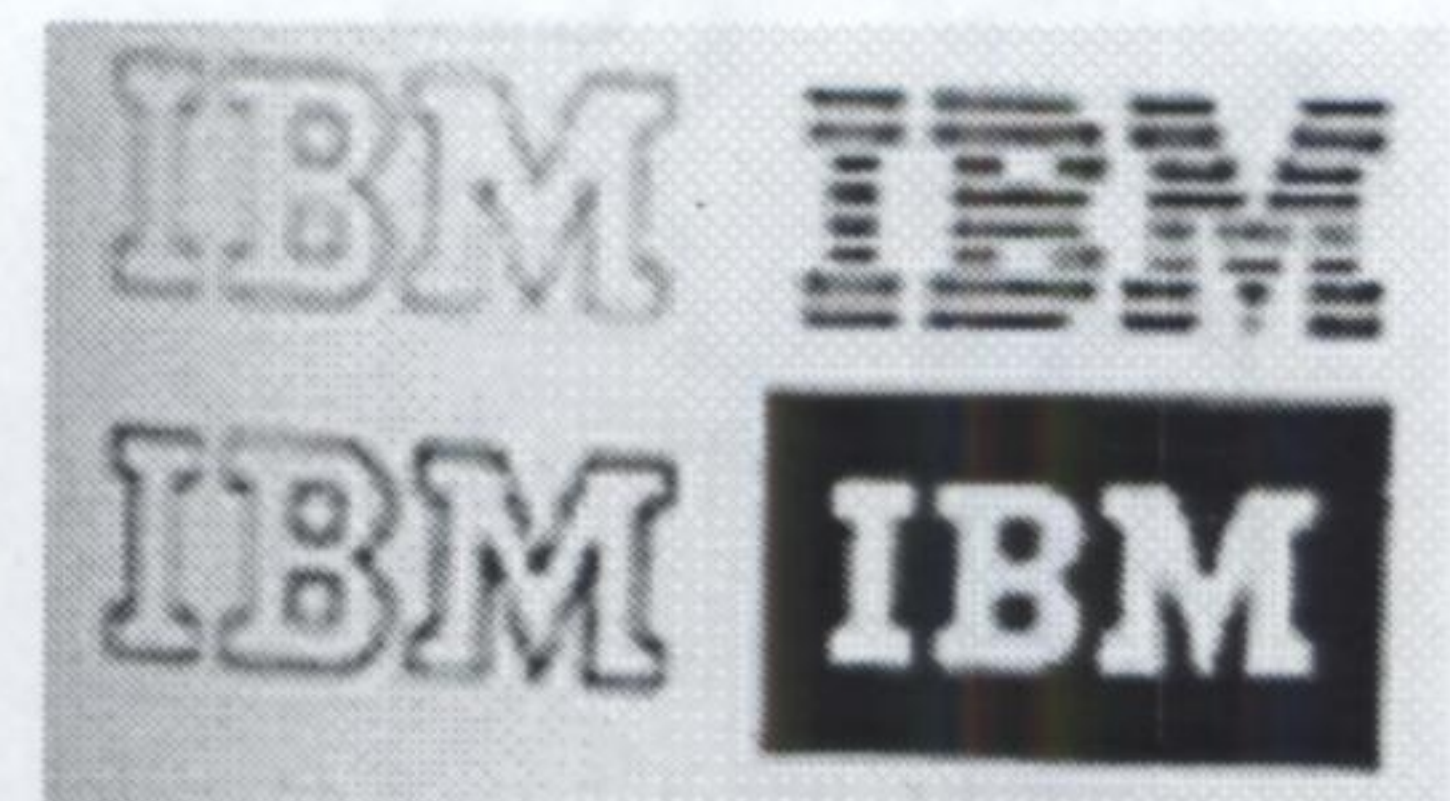


Figure 5.30 *IBM House Style Variations of 1956 logotype*
Paul Rand

5.4 CULTURE, ARCHITECTURE AND GRAPHICS

Architecture and Graphics are never isolated from one another, but have always remained integral representations characteristic of any culture; be it primitive or civilized. [3, 8] Since culture and thinking embrace every walk of a people's lives, it is no wonder even the symbols chosen to represent countries intensely draw from their cultural systems and contexts as in the words of Maurice Bourget, Speaker of the Senate: "*The flag is the symbol of the nation's unity, for it, beyond any doubt,*

represents all the citizens of Canada without distinction of race, language, belief or opinion".(Figure 5.31,32)



Figure 5.31: Australian Government Emblem
Kangaroo and Emu holding the Royal Crown



Figure 5.32 Canadian flag

William Morris and *Arts and Crafts* movement are responsible for the first book printed in 1891 at the Morris's *Kelmscott* press. The woodcut decorations and borders set in typefaces as per the specifications based on the Fifteenth Century printed letters were admired in continental Europe.(Figure 5.33) So too, the *Glasgow School* of designers maintained common design principles; sinuous contour of *Art Nouveau* and the verticality of *Avant Grade* as evident in their posters.(Figure 5.34)



Figure 5.33 *Poems by the way* book
page 1897, William Morris,
Kelmscott press

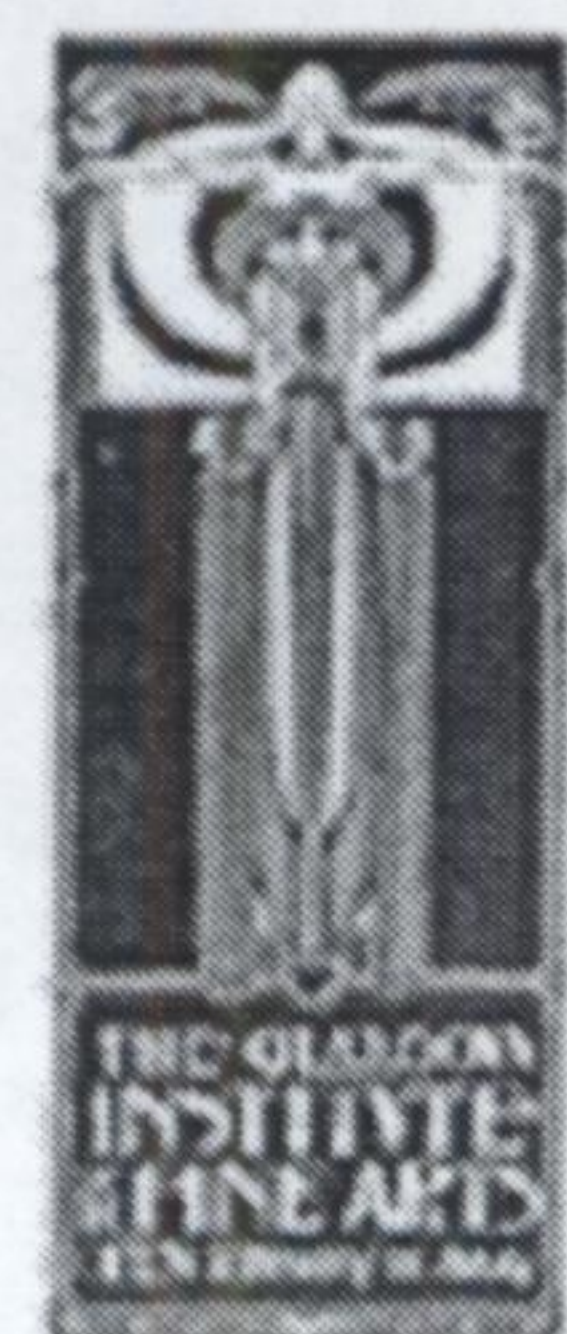


Figure 5.34 *The Glasgow Institute of fine Arts* poster 1894, Herbert McNair,
Mary Macdonald, Frances Macdonald

Gustav Klimt, a painter was commissioned in 1860 to design the built forms of new Vienna; the capital of Austro-Hungarian Empire built in Renaissance style, initiated a move different from the then prevailed 'historical style' by forming a

'Secession'; an association of artists. They employed a vertical format, empty wall like space with implication of a theatrical setting, extreme asymmetry and single weight of line. The 'even-line' unified the drawing with lettering and made it fit for graphic reproduction in tune with the 'theatrical attitude'. (Figure 5.35-37) The insistent sinuous contour of *Art Nouveau* has disappeared by 1902, and line printed in four colours as flat areas of the poster made patterns, rather than impressions of depth.



Figure 5.35 1st Secessionist Exhibition catalogue cover 1898. Gustav Klimt

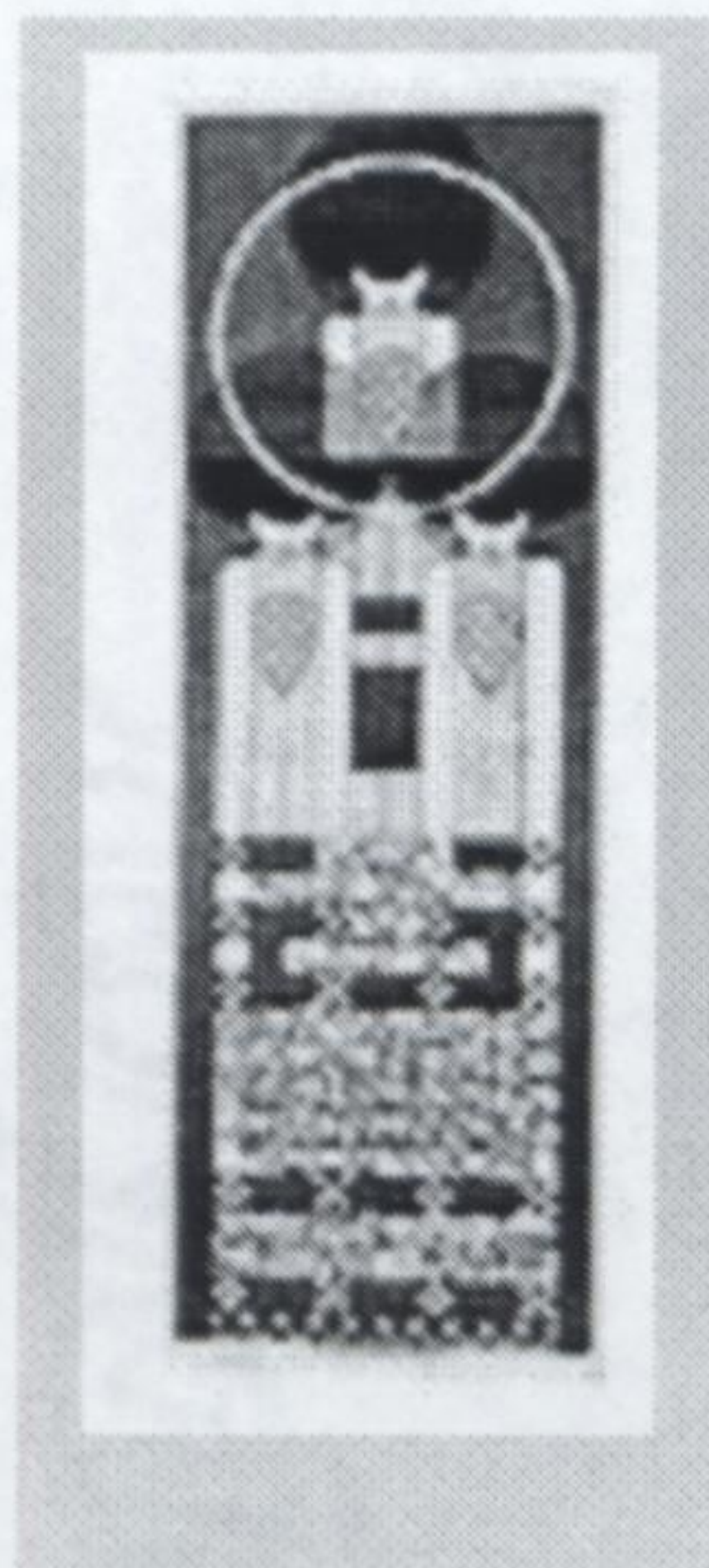


Figure 5.36 13th Secessionist Exhibition poster 1902. Koloman Moser



Figure 5.37 14th Vienna Secession Exhibition poster 1902. Alfred Roller

In Vienna, while the conventionalized forms of the letters of the alphabet were subject to stylizations in favor of decorative invention and resulting in low readability, Wagner put to work his principle; "*something unpractical cannot be beautiful*". The lettering of Auto Wagner resembles the Viennese graphic work incorporated in small square as repetitive pattern remained as obsession with the graphic designers of 'Wiener Werkstatte'; Vienna Workshops, which is a manufacturing and marketing enterprise for crafts. Historicizing designs is adopted by the radical architect Adolf Loos who chose the fifteenth century *Venetian* type deviating from the traditional

black-letter Gothic. Vienna's turn of the century designers absorbed lessons of the *Arts and Crafts* and in their eclecticism for new techniques, heralded the *Avant Grade* movements in designs that followed the First World War. The early expressionist works are based on the principle of '*interchangeability of figure and ground*' as evidenced in the works of Koloman Moser, by framing image with patterned border. Though Viennese designers broke the limits of the fashionable society and reached the very State, they remained essentially artists even many years prior to the establishment of Graphic Design as a profession. A pioneering move in this direction took place in Germany, through the works of Peter Behrens and Van de Velde who integrated art into daily life and whose works echoed the elongated format of the *Glasgow School*. Behrens designed his own typeface '*Behrens Schrift*' based on the Gothic letters and the stroke of the quill pen. Yet, in 1916 he arrived at a style stripped off historical references.

Bauhaus occupies a prominent place in the history of Twentieth Century culture, architecture, design, art and media. At a time when industrial society was in the grip of a crisis, Bauhaus stood singular in enquiring how the modernization process could be mastered by means of design. Since its inception in 1919, Walter Gropius tried to combine art with engineering and craftsmanship and innovation ran rampant through Bauhaus resulting in a multitude of advances affecting every aspects of life. Bauhaus rallied masters and students who sought to reverse the split between art and production by returning to crafts. Typography at Bauhaus is treated as an instrument for effecting communication. It is designed to communicate clearly and quickly and in comparison with prehistoric pictographs. Clarity is considered the

hallmark of the Bauhaus script. Unambiguous clarity and legibility in communication is never allowed to suffer for any aesthetic code adopted, since the individually precise intellectual attitude to the world gives a way to the changing collective precision and its amorphous forms. In 1923, Bauhaus turned its attention to industry Walter Gropius; its founder and first director. A major exhibition which opened in 1923 reflected the revised principle of art and technology and a new unity spanned the full spectrum of Bauhaus work. Its books and publications also displayed typical elements of Bauhaus Typography; *sans-serif*, over-size numerals, horizontal and vertical bars whose function is to emphasize, help organize or to decorate in an attempt to rationalize and standardize. Further, Bauhaus rationalism demanded the use of lower-case letters only, since it is most reasonable to signify a single sound by a single graphics.[3, 90] Strict geometric basis is adopted for all the design-attempts at Bauhaus to shun Renaissance and other Germanic traditions. Jan Tschichold, the chief propagandist of the New Typography, based it on the following elementary principles:

1. Typography is shaped by functional requirements.
2. Aim of typographic layout is communication since it is a graphic medium and it shall happen in the shortest, simplest and most penetrating form.
3. Since the typography is to serve its social ends, its ingredients need internal organization; 'ordered content' as well as 'external organization'; proper relationship among typographic materials.

The influence of *Dadaist's*; anti-establishment, anti-military, anti-art along with *Futurist* disdain for traditions and their preference for a more disciplined version of *Constructivism* to facilitate mechanization could be traced in the changing graphic

designs at Bauhaus. The school's first emblem; a mason's mark, spread-eagled figure carrying aloft a pyramid, is replaced in 1924 with a geometricized head which could be easily reproduced from printer's rules.(Figure 5.38,39)



Figure 5.38 *Bauhaus symbols*
Used during 1919-22

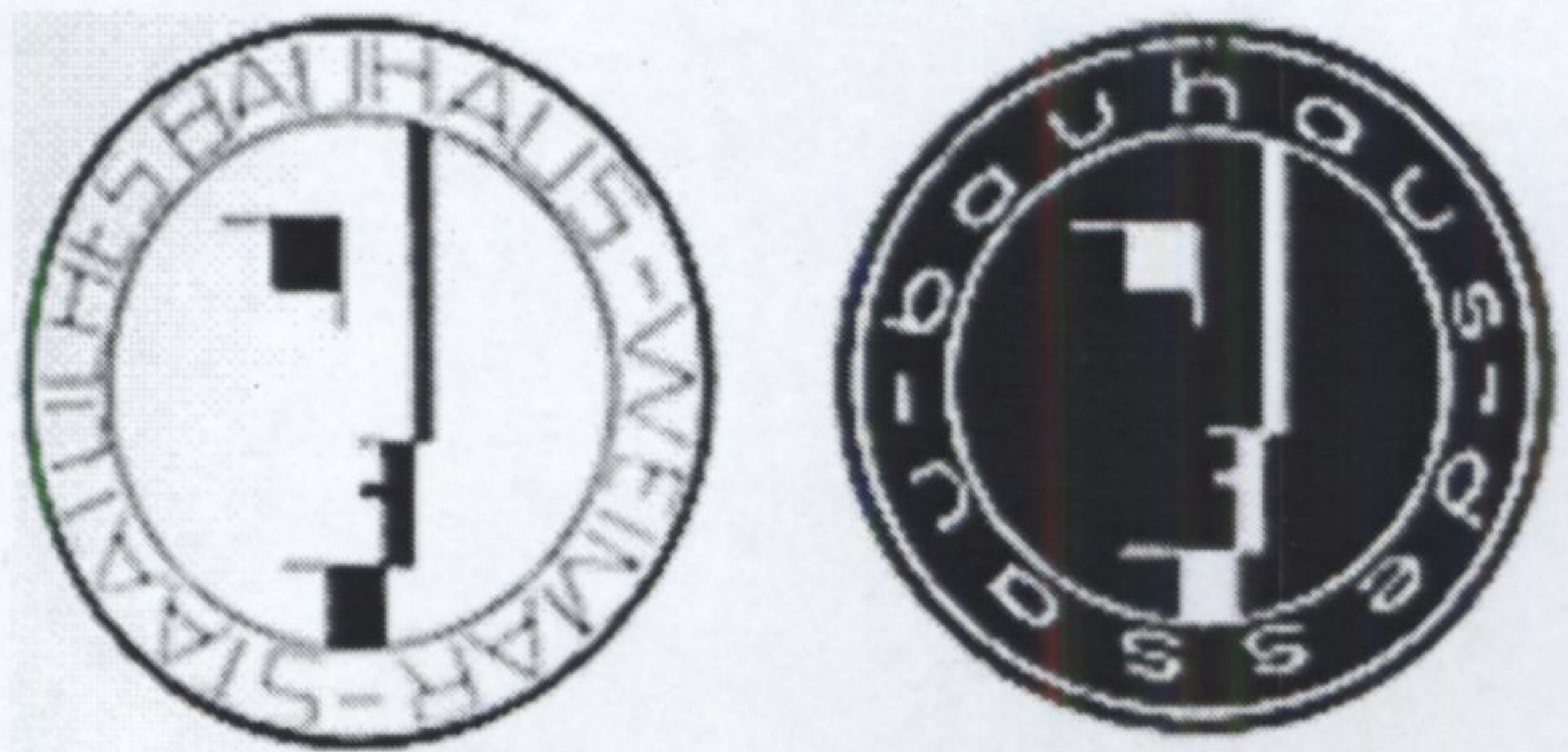


Figure 5.39 *Bauhaus symbols*,
Used during 1919-22 Oskar Schlemmer

Herbert Bayer brought similarity in all the Bauhaus works by way of standardization of paper sizes, red and black printing with heavy vertical and horizontal rules. Its principles echoed in Moholy-Nagy's dictum that typography shall be "*communication in its most intense form with absolute clarity*" and the principle of ranking words in sizes according to their importance in a message.(Figure 5.40) Further, Max Burchartz in 1924 explored the concept of '*message and receiver*' by analyzing the function of '*publicity*'; what makes it effective and how the viewer is involved. Functional expression is derived from organization of the 'raw material' and balancing of contrasts; opposition, tension and conflict. In his design for 'art of advertising', an exhibition catalogue cover a photographic image of hands with *Sans-Serif* lettering is combined as metaphor and information.(Figure 5.45) Through a dramatic arrangement of words and image, meaning is established against a dark background where the hands form a metaphor for attracting the public, which is given meaning by the word "*Werbung; publicity*", which it illustrates.(Figure 5.41)



Figure 5.40 *Besuchsanzeige post card*
Herbert Bayer 1925



Figure 5.41 *The art of advertising:*
Exhibition catalogue cover, 1931
Max Burchartz

In Netherlands, with the pronounced influence of Russia and Germany, Piet Zwart produced works where geometry pervaded. His own emblem is a combination of letter P; signifying Piet and a black square; a static form signifying the flat rectangular sheet in printed work. (Figure 5.42) So too, H. P. Berlarge, the designer of Amsterdam stock exchange, believed that geometry is not only useful in the creation of artistic form, but an absolute necessity. In Holland, De Stijl; *the style*, produced works with characteristic rectangularity exemplified in the abstract paintings of Piet Mondrian which consist of a grid of black lines on a white canvas with a few rectangles filled with primary colors or grey.

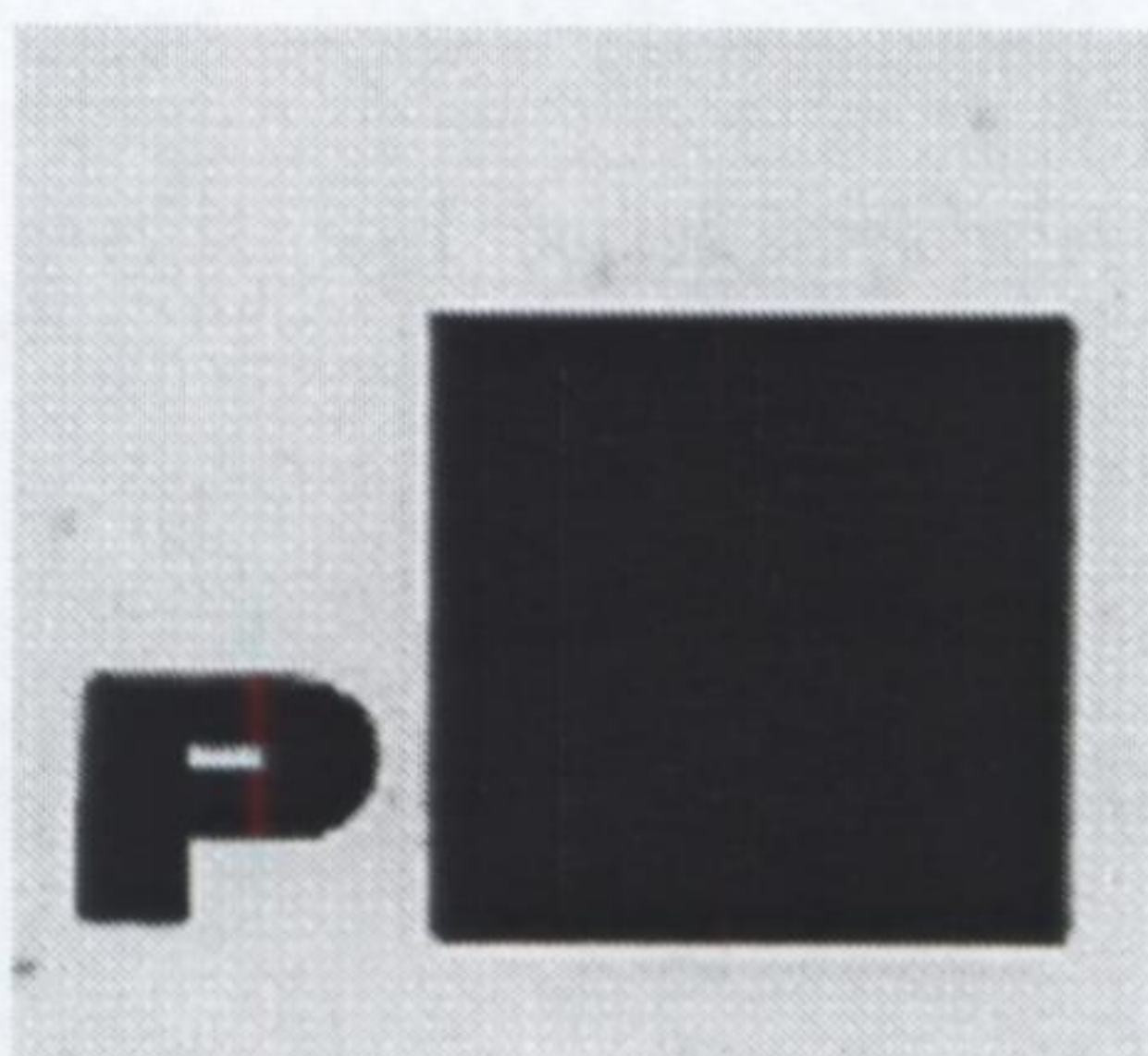


Figure 5.42 *Designer's personal symbol* Piet Zwart, 1924

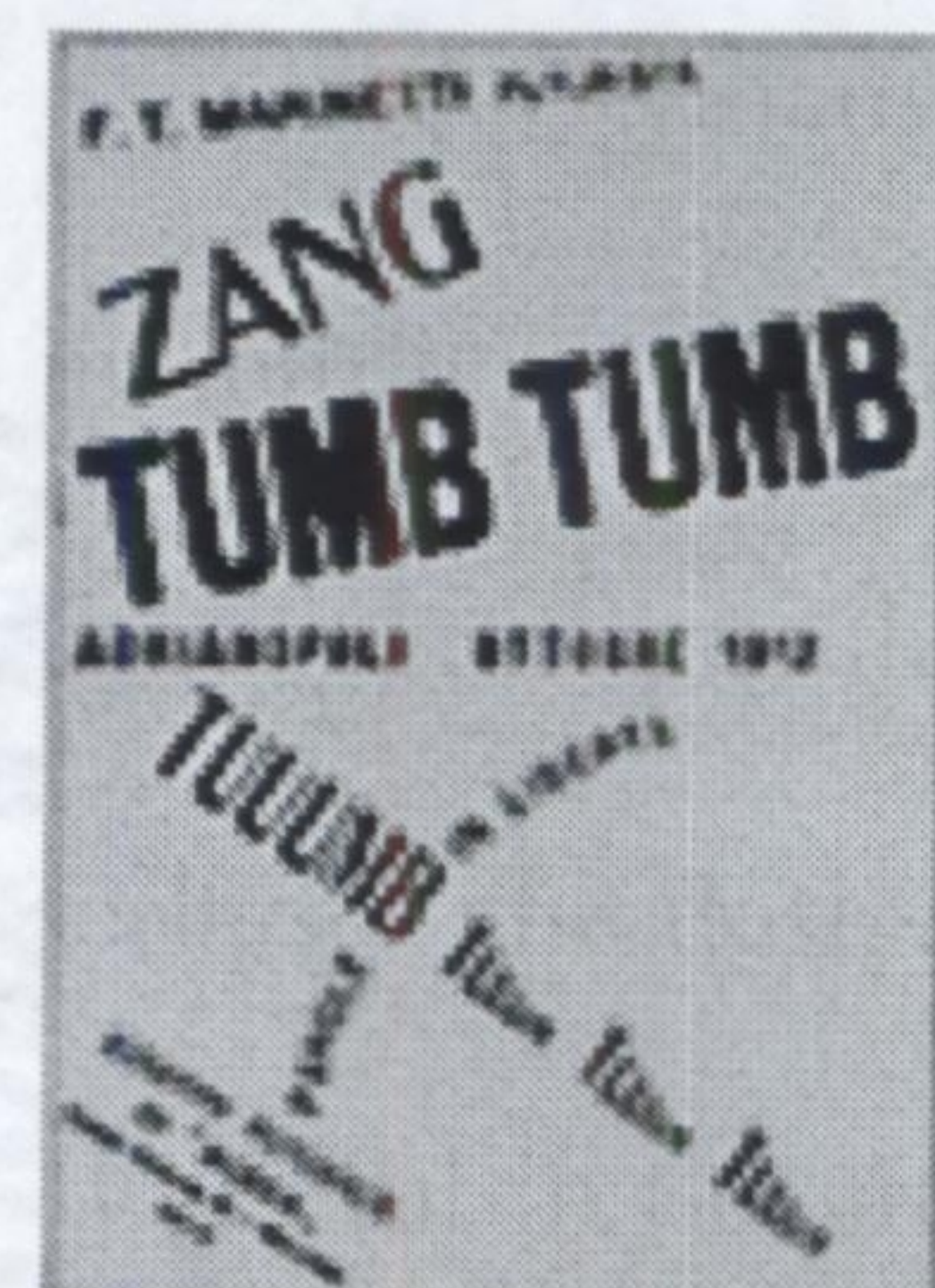


Figure 5.43 *Zang Thumb Thumb*
Book cover 1914, F.T. Marinetti

Though the foundations of the modern art were laid by *Avant-grade*, it also marked the inception of novel ways to look at alphabets and words in order to generate images. *Futurism*, lead by the poet Filippo Tommaso Marinetti who published the Futurist manifesto in Paris in 1909, broke away from the traditional symmetrical layout of the printed page and took for the message the glorifying aspects of modern life such as speed, motor cars, airplanes, war etc. The book of '*parole in liberta*', entitled *Zing Tumb Tumb*; the loudest sounds of battle, which he wrote to celebrate the battle of Tripoli, in which attempts were made to generate visual equivalences of sounds by way of shape and relative size of words.(Figure 5.43)

Marinetti proposed to confound the object with the image and suggested that letters that make up words are not merely alphabetic signs, but they acquire a different expressive character, if given different weights, shapes and appropriate position in a layout. Moreover, words and letters could be used as visual images almost in their own right, replacing pictures. Though there is a child-like element in Futurism, its simplicity is its strength. Futurism manifests conflicting tendencies by way of its aggressive modernism and monumental neo-classicism which made references to the ancient Roman Empire, with very low view points lending a heroic character to everything it represented. In the hectic atmosphere following the Russian revolution in 1917, especially with a semi-literate society, images and words became agents of revolution. Posters were used as loud speakers with its high-impact visual slogans and vivid political allegories. D. S Moor brought out graphic allegories that gained power in enlargement of haunting contrasts of 'then and now', 'enemies versus heroic allies', 'Imperialism against workers' struggles' to which a simple slogan was added. Many

of Victor Deni's and D. S Moor's works were in symbolic black and red, where red signifies revolutionary elements such as flags, workers' shirts and peasant blouses and black to signify '*solidity, capitalism, and priests*'. Moor created poster; 'Help', where a lone figure of a skeletal old man appealing for the victims of the 1920 famine.(Figure 5.44) Later, the drawings of the skeletal old man and the two wretched stalks of barley ceased to be illustrations, but a single graphic idea; an ideogram of hunger. So too, in Deni's graphically concise poster that integrates slogan and illustration; '*the third Communist International*', a red hand writes in red '*the Communist International*' on a black rectangle forcing the capitalist in top hat to cover below it.(Figure 5.45)



Figure 5.44 **Help**, Poster 1920
Dmitri Moor



Figure 5.45 **The third International**
Poster 1921, Viktor Deni

The Constructivists rejected the idea of art as belonging to the old bourgeois society and demolished the division between art and labour by introducing abstract forms; especially photographic images. Photomontage works of Gustav Klutis combined photographic and graphic elements along with explanatory statistics established that meanings of images could be understood without reading slogans or captions.(Figure 5.46,47) Though, words and figures make the meaning of the graphics more specific, their role is secondary to the larger metaphorical roles. The *Art*

Directors established in 1930 marked the beginnings of Graphic design. By 1958 they realized that ‘art’ connotation is unhelpful and the advancement of print technology needed an appropriate professional title like ‘visual engineering’ or ‘graphic design’.



Figure 5.46 **Development of Transport**
The Five-Year Plan, Poster 1929
Gustav Klutssis



Figure 5.47 **Man with a Movie Camera**
Film poster 1929
Vladimir and Gyorgy Stenberg

Lithography gave way to letterpress giving designer greater control over the production process of graphics. Paul Rand, a pioneer of the new advertising in which the spectator was active, not passive, advanced the need for the designer to invent a means of communication between the designer and the spectator, is also credited with the invention of Modern Movement systems such as *collage* and *photogram*. His works in black and white explored the scope of ‘positive and negative’ and a means to heighten tension between black and white by respective opposing areas.(Figure 5.48) Herbert Matter, on the other hand, heightened the effect of the image by increasing the tension within the image itself.[3, 90](Figure 5.49) Will Burtin, the art director of Fortune magazine from 1945 to 1949, promoted the use of manuals with clear diagrammatic illustrations where a mere recitation of facts is not sufficient. His heraldic gunnery manuals testify to the fact that ‘whenever all the elements of a design are recognized, studied and brought coherently together, the

result is hardly ever unpleasing to the eye, thanks to the beauty it achieves through a clear statement. The training time for aerial gunners using the gunnery manual was reduced exactly to half; from twelve weeks to six.



Figure 5.48 Catalogue Cover
20th century Art Collection
Paul Rand 1948



Figure 5.49 Knoll logotype
Herbert Matter, 1950

IBM's guide regarded the necessity for a corporate design programme, intended to enforce visual discipline throughout its organization by a set of comprehensive rules governing every aspect of production and products. Graphic signs, the way in which United States communicated its character with the world outside, is summarized by Herb Lubalin who pioneered the use of words as images:

"At the heart of American graphics is idea, the concept and all else; photography, typography, illustration, design is its handmaiden". [3]

Graphic Design established itself as a specialist profession by the mid 1960s with the establishment of American Institute of Graphic Arts; *AIGA*. The International Council of Graphic Design Associations; *ICOGRADA* met in 1964, in Zurich. Through the frank display of graphic methods and manipulation of space by the use of modern technical means to develop new forms, design remains a part of the economic

and cultural life of cities. Its growth is facilitated by the journals, especially of style in the US, as well as studies in communication theory and traffic signage. Britain used posters extensively in the post war period for commerce and educational propaganda in the fashioning of a new world. *Council of Industrial Design* was established in 1946 and design became a part of a programme of its economic and social reconstruction. Modernism in British commercial advertising was dominated by functional modernist Ashley Havinden, *Crawfords*, who held the view that, 'designers are *solvers of problems of communication*'. Hans Schleger designed a symbol for the *Mac* fisheries incorporating four geometrical fishes signifying its natural source; a powerful use of metaphor. So too, in the symbol for *Finmar*; importers of Scandinavian furniture, he designed the typeface in light, medium and bold version; a metaphoric identification with fir tree. Graphic design gradually became more established and the *Designers and Art Directors Association* was founded in 1963. Jan Tschichold introduced 'colour coding' for the first time at Penguin publishers and established standards for typography and refined its symbols for added dynamism.(Figure 5.50,51) Since 1930's these had used *Gill Bold type* and vertical bands of colour which identified books by category; orange for fiction, light blue for non-fiction, green for crime, yellow for miscellaneous, magenta for travel and grey for current affairs.[3]



Fig.5.50 Penguin symbol

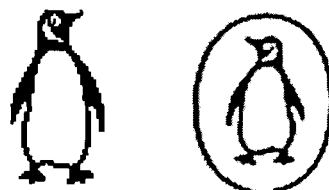


Fig 5.51 Penguin symbol
Redesign, 1947, Jan Tschichold

Graphic design had expanded during the 1960's and embraced the areas earlier dominated by craft traditions, television and video. However, it is Olympic Games that enhanced the role of graphic designers in public service since it depended heavily on graphic designs for its publicity, programmes and comprehensive sign systems.(Figure 5.52,53) A full-scale demonstration of the systematic approach to graphic design to solve communication problems was devised for the Munich Olympic Games in 1972 where every item of publicity and signs, designed by *Otl Aicher's* team was governed by geometrical grids. So too, the symbol for Leverkusen Municipality of Rhine town; a square tilted at 45 degrees, manifests the rigid control by the grid.(Figure 5.54)



Figure 5.52 Olympic Games symbol Masaru Katsumi

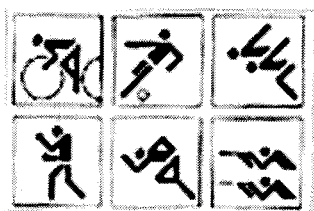


Figure 5.53 Olympic Games symbol Munich 1972

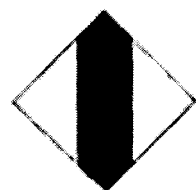


Figure 5.54 *Leverkusen* symbol Rolf Müller 1970

Canada, in 1969 became the first country that sought for more than a flag and chose a system for its graphic identity that made it adopt a symbol and a logotype in 1980. Graphic design became a part of business by 1970, in imparting recognizable images for companies as to how they wished to be seen and remembered. Nevertheless, the impact of modernism is quite pronounced in the making of value-free designs by stripping off all historical references, though it lead to a dry formalism and prompted designers world over to search for the lost soul as expressed in the words of impatience by Tadanori Yokoo similar to the cries of the people of Santa Fe:

“Modernist design, linked as it has become to modern industry, has made a contribution to our materialistic civilization. But, conversely, it is now trying to rid us of our souls”.

The advent of ideograms that produced an idea by locking-in words with image, is an impressive invention by Barney Bubbles in 1977.(Figure 5.55) The breaking of the approved graphic convention of modern movement; the suppression of depth is achieved by Gert Dumbar in his poster for ‘De Stijl’ exhibition of 1982 by introducing a natural perspective that opens towards the viewer in the lower third.



Figure 5.55 **Blockhead** - Ideogram
Rock band logotype, 1977 Barney
Bubbles

By the end of 1980s, graphic design as a style became a vital aspect of retail marketing and its over-emphasis manifested as a virus resulting numerous styles. In the contemporary world of mass communication many countries retains powerful national identities through the graphic styles of their airlines and rail roads where the rationality of grid and the use of problem solving techniques are successfully employed. User-oriented symbol making is pioneered by Jean Widmer, a Swiss graphic designer who initiated an analysis of the graphic needs of the visitors in the design of directional signs for the *Centre Georges Pompidou* in Paris. He derived a

symbol for the Centre from a side view of the building; a parallel for which could be found in the symbol for the Canadian national railways, showing the escalator serving its five floors; a diagram indicating the points at which directions were essential. It was split into three zones, *towards*: the visitors' possible starting points, and means of transport; *around*: Possible approaches and points of entry to the building and *in*: circulation within the Centre itself. Legible and familiar typewritten like lettering placed at eye level enhanced the readability. (Figure 5.56,57) Widmer is also credited with the design of signs to be read at speed, especially the road-side signs enlivening the otherwise featureless anonymity of the motorways, giving an idea of what lies beyond the margins of roads. (Figure 5.58)



Figure 5.56 Canadian National Railways Symbol, 1959, Allan Fleming



Figure 5.57 Centre Georges Pompidou Symbol, 1974, Jean Widmer

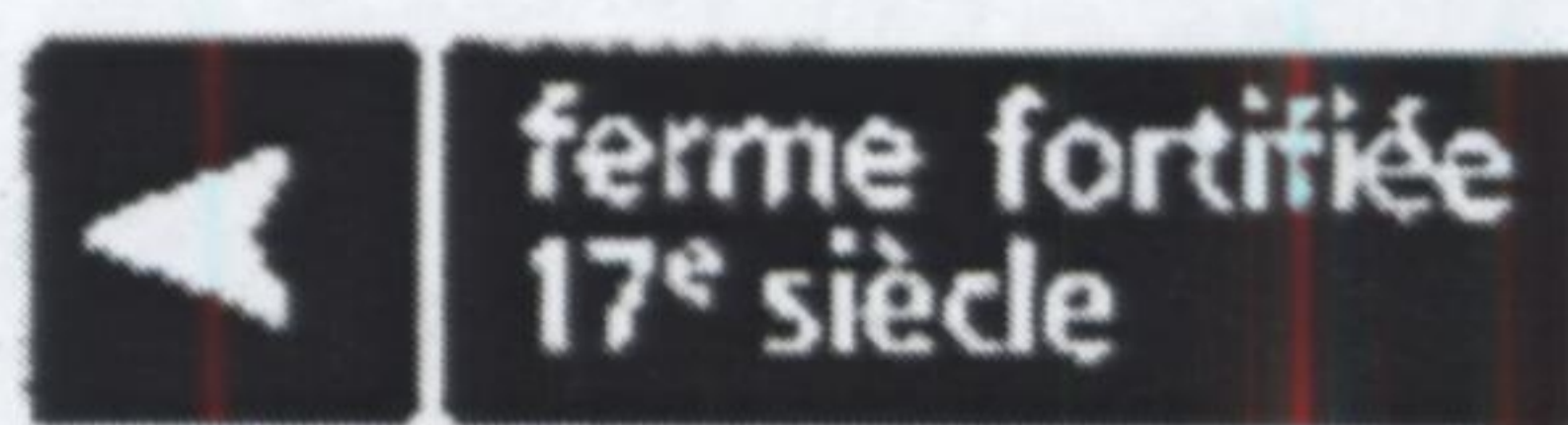


Figure 5.58 Road signs
Jean Widmer 1972



The contribution of the Italian designer, Mimmo Castellano is unique in the methodical solving of problem of communication for a group of heterogeneous

tourists. He conceived diagrammatic maps and devised sets of symbols derived from a list of two hundred fifty key words which represented concepts for which signs were essential. These were graded with the system of stars and divided into fifteen categories, such as communications and sporting facilities, to indicate their availability and location. Critical theory, especially of French structuralists and linguistics, marked its influence on graphic design with its introduction in its course at Cranbrook. In 1988, at Massachusetts Institute of Technology an ambitious project led by Muriel Cooper, to bring together various disciplines with graphic design was launched. It became an experimental bridge between computer and four hundred years of printing that looked forward to the expanding horizon of graphic design; into animation, video and digital media.

5.5 SYMBOLIC VALUE OF IMAGES

Photographs are used to reconstruct an event in proper sequence through select expositions, over its value as a record of moments in temporal context. Peter Knapp, a Swiss designer, generated the outline of forms with photographs taken against black or white backgrounds and used these in designs in complimenting or contrasting organizations.[3](Figure 5.59) A parallel to Knapp's method could be seen in Saul Bass's 1984 design of the trade mark for *Quaker Oats* where he used positive and negative characteristics and photographic techniques in symbol making.(Figure 5.60) However, geometrical images are the divinely ordered choice of certain cultures due to demands of their religions. Corporate companies too, prefer abstract geometrical forms thanks to their 'bias-free' nature. Rationalizing such symbols became a practice imparting corporate identity. The *Roussel-Uclaf* symbol by Raymond Loewy

composed of three identical parallelograms, arranged symmetrically within an equilateral triangle generated a similar triangle in its centre.(Figure 5.61) The symbol is incisive; balanced and open. Yet its nature does not represent any specific culture, but fosters a group identity.



Figure 5.59 **Elle**
Magazine double pages
Peter Knapp, 1960



Figure 5.60 **Quaker Oats**
Symbol 1970
Saul Bass



Figure 5.61 **Roussel-Uclaf**
Symbol, 1963
Raymond Loewy

The value of geometrical forms in signifying concepts is evident and studies conducted establish that even pragmatic societies relied on such forms and graphics in communicating their culture and values to generations. These themes include the cyclic, immutability and the dynamic.(Figure 5.62-66)

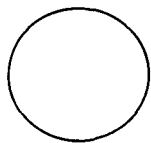


Figure 5.62 **Circle**
Static expression
implying
significance of its
centre

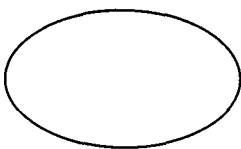


Figure 5.63 **Ellipse**
Dynamic expression
implying movement

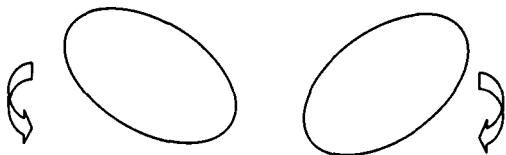


Figure 5.64 **Ellipse - Tilted**
Dynamic expression implying movement with
additional speed and directionality acquired by
tilting, in which case the clockwise movement
suggests even faster fall

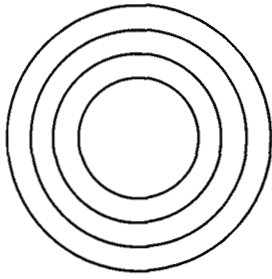


Figure 5.65 **Concentric Circles**
Signifying expanding ripples, its centre which defines the circles and anything that spreads out in harmony with the central authority

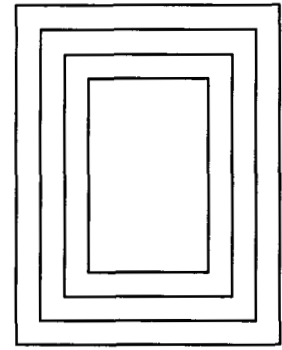
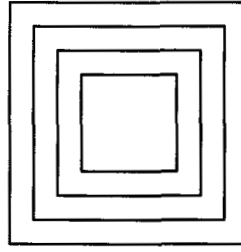


Figure 5.66 **Concentric Rectangles – Modern and dynamic**
Transformations of concentric circles; concentric squares more static in its nature are often the choice of traditional societies, whereas, concentric rectangles signify modernity and dynamism; yet both signify expanding ripples and their common centre.

The design school at Ulm in Germany made the pioneering attempt in 1951, in an effort to find a critical system and language to examine visual communication by borrowing from linguistics, advancing the idea of ‘visual rhetoric’ and employing semiotics in the analysis of designs.

5.6 DESIGNS FOR LOW-READABILITY

Anti-establishment attitude of various younger middle classes; better described as underground, sought alternative cultural and political stands which opposed the conventional society. Their graphics and communications joyfully accept the illegible quality of offset printing on cheap paper. Moreover, overprinting of text on coarse colour images ensures that such posters are never read by anyone over thirty. (Figure 5.67,68) Underground graphic productions employed photo-mechanical transfer which facilitates manipulation of images and gave designers direct control over the earlier stages of preparation of graphic work for printing.



Figure 5.67 Elle
Magazine double pages



Figure 5.68 Elle
Magazine double pages

Interestingly, it is students of *Ecole de Beaux-Arts*; *Atelier Populaire*, who advanced the economical production of posters. These are done in silk screens and the posters explored the simplicity of graphic means through manual lettering and brushed silhouettes. Thus, they questioned the complex apparatus of printed image made in the consumer society whose values they opposed. (Figure 5.69,70)



Figure 5.69 *Poster*
Paris, 1968



Figure 5.70 *Strike' Poster*
Berkeley, California, 1970

5.7 METAPHORS AND MEANING IN SYMBOLS

Capitalism gathered strength to transform cultures in the twentieth century whereas religion ruled every aspect of the primitive cultures. The position of religion

is occupied by Capitalism and symbols of consumerism in later centuries. Symbols of consumerism and style supported by industry and commerce dominates today's world. Freedom of choice offered by increasing globalization, advancements in technology and media generates a culture whose people are mesmerized by the power of images and enjoy what the product promises more than the product itself.[37] It is here, the power of metaphors to generate meaning is creatively used in communication. Though the emblem of *New Man* clothing company initially suggested the Wild West and closely associated with cowboy boots, later in 1969 it was modified to an electronic New Man Logo. Image in the initial case echoed the metaphor; wild nature, whereas the digital-grid metaphor and alien-style lettering signified modernity and capitalist culture with its alluring imageries.(Figure 5.71)

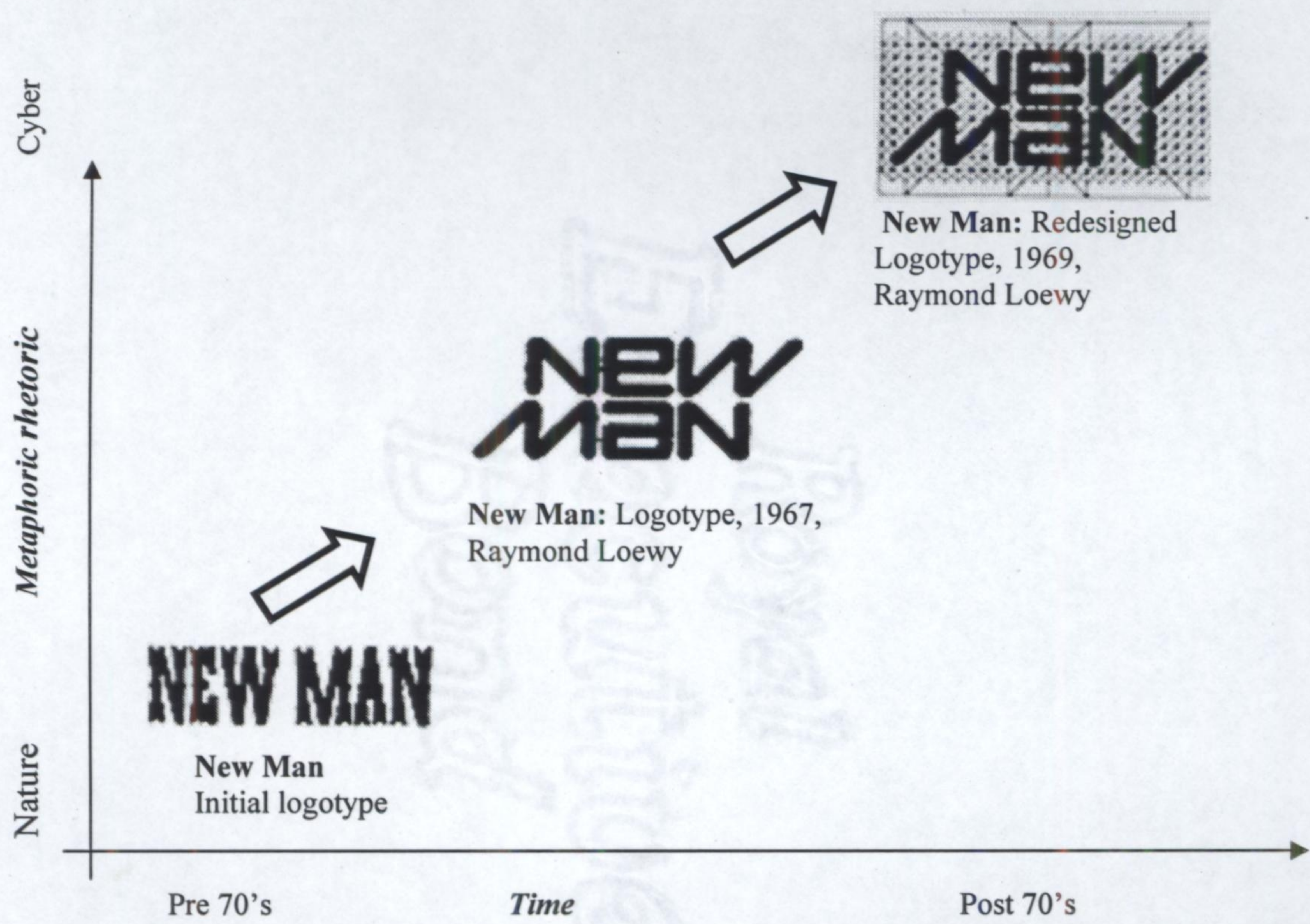
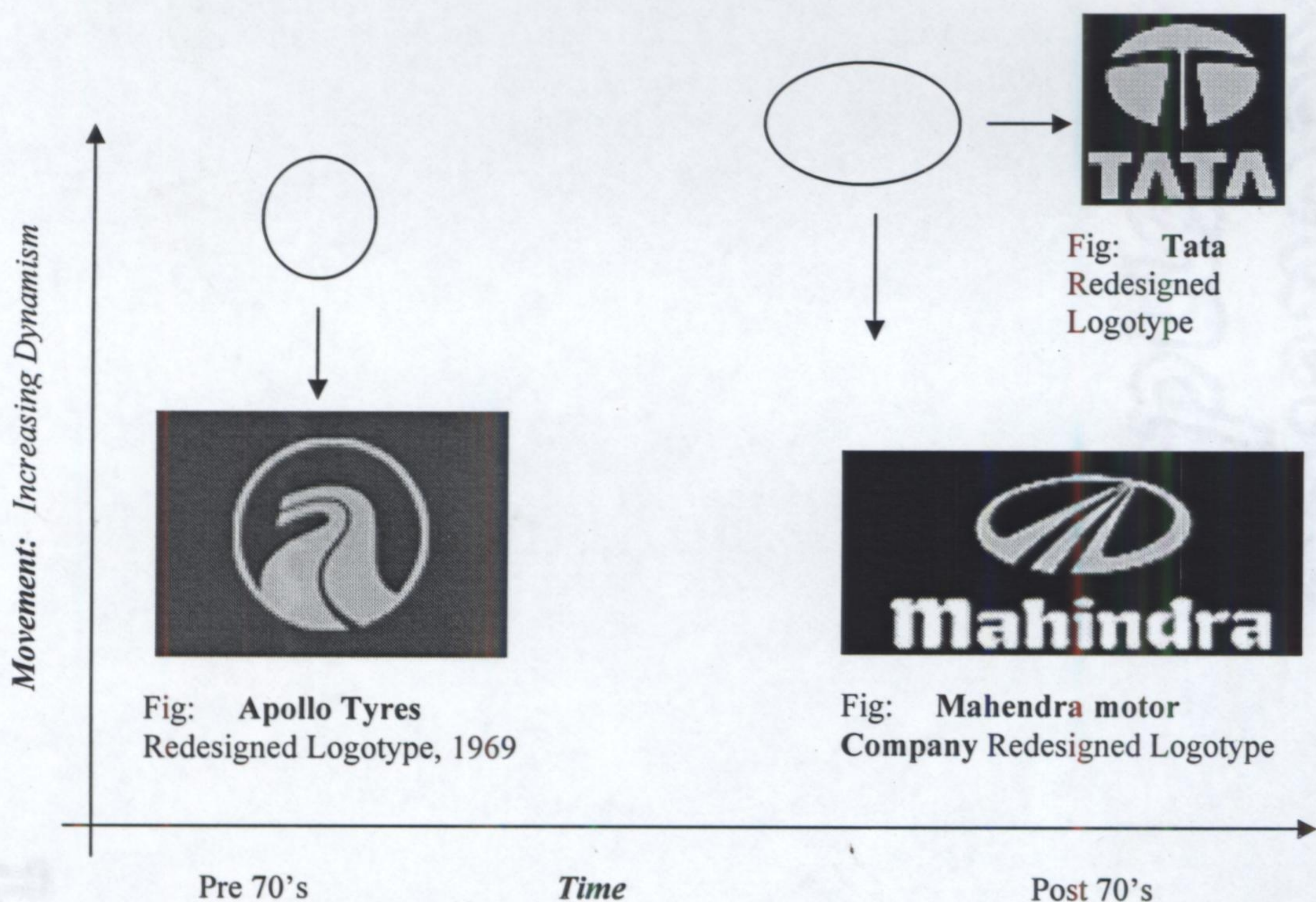


Figure 5.71 Case Study 01: Use of metaphors in the generation of effective symbols

In Case Study 02, the metaphor; road, signifies the myriad of travel experiences and effectively generates meaning in receptors. Moreover, the perspective in the ellipse imparts a sense of dynamism and speed which elevates recipients to more of an active plane.(Figure 5.72) Further, it is evidenced that all the companies chose to be signified by the road-metaphor, even at the cost of lost uniqueness, which establishes the preference for functional effectiveness in the choice of a symbol over its artistic values. Graphics, in such cases, is communicative and aesthetics is intrinsic in its performance efficacy.



The British designer, Hans Schleger's symbol for the Mac fisheries incorporating four geometrical fishes into the Scottish St. Andrew's cross, is another fine example for the powerful use of metaphor from the nature.(Figure 5.73) So too, he

transformed the typeface in light, medium and bold version; a *metaphoric identification with fir tree*, to generate the symbol for *Finmar*; importers of Scandinavian furniture.(Figure 5.74) In the 1968 poster by Tony Evora, 'Day of the Heroic Guerrilla', he chose the eloquent Christ-like image of *Che Guevara*; an embodiment of armed struggle and expanded it in concentric rectangular ripples over the map of South America, thus making it a precise graphic metaphor for the spread of revolution.(Figure 5.75,76)



Figure 5.73 Mac Fisheries
Symbol and Logotype, c.1953 Hans Schleger

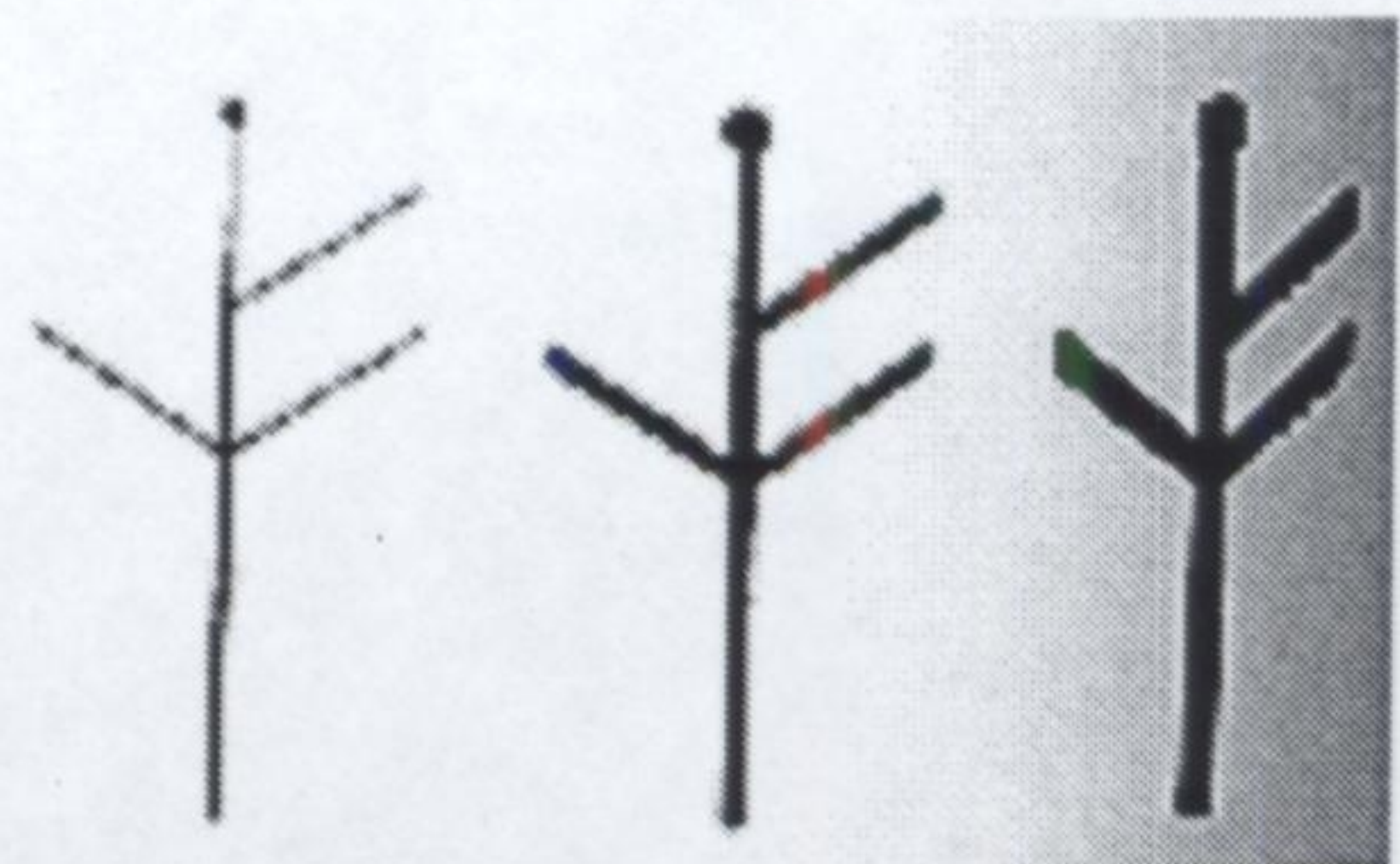


Figure 5.74 Finmar
Symbol, Hans Schleger



Figure 5.75 *Day of the Heroic Guerrilla*
Poster, Tony Evora 1968

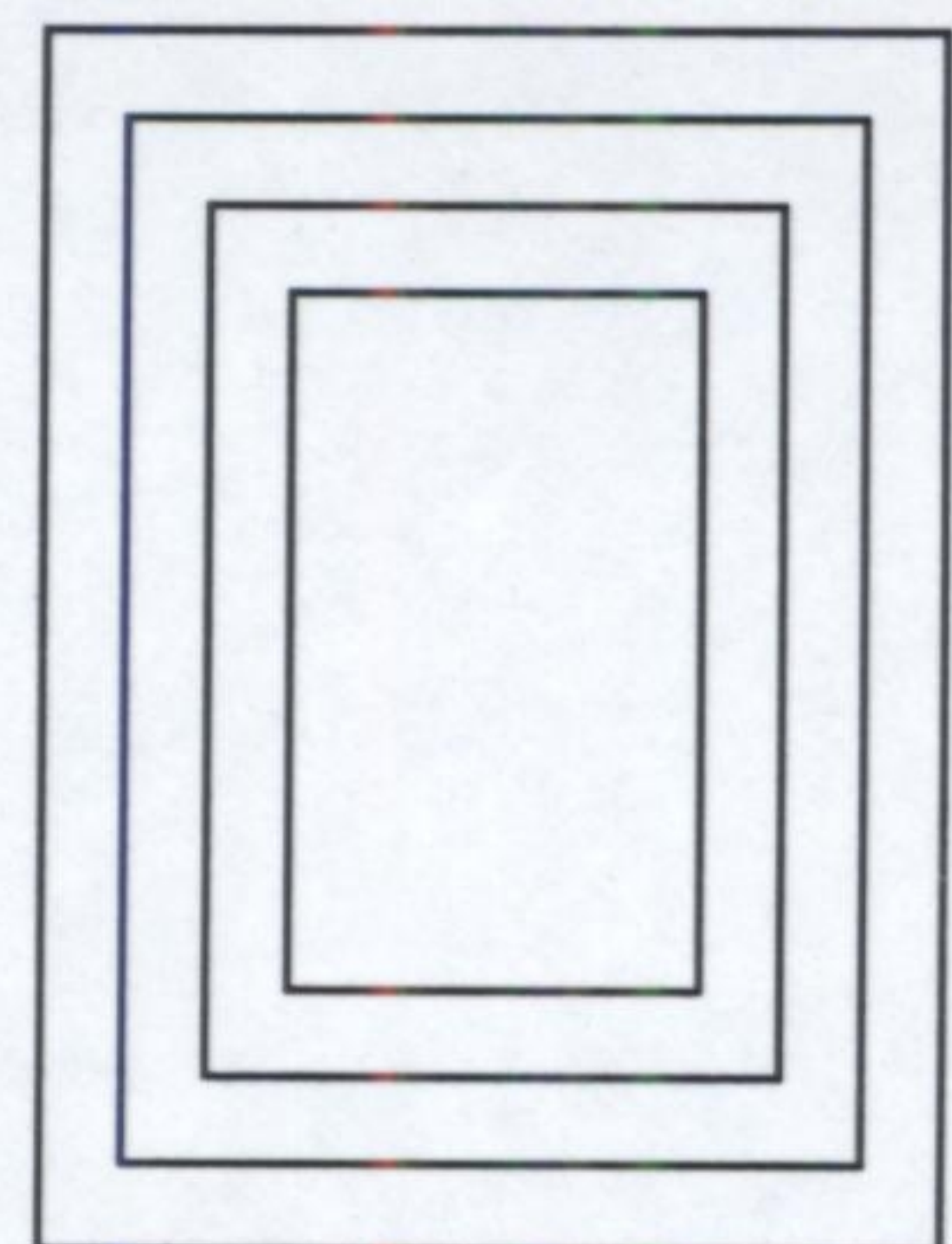


Figure 5.76 *Concentric Rectangles*
Transformation of concentric circles;
concentric rectangles signify modernity and
dynamism; yet both signify expanding ripples
and their common centre.

The study on the development of Graphic Design critically evaluates the major contributions of various movements and individual designers in the making of effective symbols and graphic tools like posters and manuals. Moreover, considerations for making symbols 'bias-free' for effective communication to heterogeneous receptors are established. A comparative evaluation of symbols against time establishes the influence of style and technology on graphic designs. Problems of higher education, especially architectural education, remain another vital area to be probed in the Sixth Chapter.

6.0 HIGHER EDUCATION: PROBLEMS AND PROSPECTS OF CLASSROOM TEACHING

Universities of around world, especially in the past centuries have enjoyed a very privileged position which is made evident by the shortage of information about their structure and activities. The lack of statistical information and data keeps the sociology of higher education still in infancy. Even the concerted efforts taken up by *International institute of Education* in Paris to offset this lacunae through their project entitled '*Planning the Development of Universities*', aimed to collect information about planning mechanisms and adaptive techniques have faced the non-availability of statistical information.[4] Such a situation poses serious constraints for the investigators as well as effective management of institutions. Various programs launched by the All India Council for Technical Education like the '*Early Faculty Induction Programme*' testifies to the non-availability of qualified teachers in Indian context. The situation demands an answer in terms of appropriate, creative methods of teaching and learning that springs forth from the right attitude to the changing trends, since the students of today are the teachers of tomorrow.

The higher education systems in developing countries labour under a number of disadvantages and with no backlog of experience to draw from. Coupled with it, there is growing difference in learning habits and expectation of students due to a steady rise in the number of women and children from working-class families entering higher education. Therefore, apart from the traditional academic motives for creating a new curriculum pattern, one must take note of the student's demands for relevance of any course which is equally important in the dynamics of today's higher education, thanks to the changing external pressures arising from the skilled manpower needs of a society and its varying employment patterns. It is no wonder even in premiere institutions of the Country, 50% or more of the architecture graduates turn to software and related jobs; a grave situation that requires immediate attention by way of appropriate curriculum and pedagogical tools in order to generate quality-architects who possess fundamental knowledge, essential skills and sensibility.[5, 6]

There is a sense of dissatisfaction prevailing in students in terms of lack of relevance, poor teaching, ill-prepared and delivered lectures which are coupled with the impersonality of large classes and the lack of *real contact* among students and faculty members. Mostly, these lead to reduced learner-involvement in classroom teaching and never culminate in learner-empowerment. The pursuit of knowledge and knowledge-communication shall be treated at par with one another and the learner has to be involved in the teaching-learning process. Learner involvement is facilitated through the 'communicational love' and 'respect for the developing person' which instills love and makes them humane not demonic which is characterized by intellectual arrogance.[4, 19]

“Those who are learned but do not possess love, they really become demonic. They will be characterized by intellectual arrogance, spiritual crassness and coldness of heart”.

Dr. S. Radhakrishnan [91]

It also remains a fact that the concepts and methods of university teaching are yet to be in line with contemporary knowledge of human learning and behavior, failing education of its primary role of societal empowerment along with helping the students to earn a living.[4, 91] Moreover, the differences in cultural and socio-economic backgrounds produce greater variations in learning than in the methods or conditions of instruction which demand effective learner oriented pedagogical tools and methods. Moreover, thanks to the knowledge explosion, the ability to find one's way to a specific item of information, to retrieve in usable form and apply it effectively to solve a specific problem is becoming more important. The shift in paradigm shall inevitably transform what is taught and how it is taught. Moreover, a balanced view of education shall foster imagination and refine emotions in addition to intellectual training, as opined by Dr. S. Radhakrishnan.[91] Therefore, the need of the hour is to develop some means to transmit the required skills to the student and opportunities to develop his learning capacity; to participate more in the learning process, and to judge his performance by criteria other than the ability to regurgitate information in a written examination. Moreover, it may be possible to develop a viable technology and tool for instructing the masses of the population to higher levels of knowledge and skill in education, as it passes through an inevitable phase of evolution. Interpretation of symbols facilitates interaction and creates the right attitude in learners in architecture for observation and graphical thinking that results in imageries. It is the learner-participation and inculcation of the right learning and

design attitudes in them that are kernel to the sustained learning and learner-empowerment. Symbolic thinking and pedagogic tools promise a great deal in the changing context of architectural education through its innate ability to involve the students in the teaching-learning process.[5]

6.1 FUNCTIONS OF TEACHING

Teaching, through all its interactive process shall result in the learner empowerment effecting the overall personality development of students. Both quality and quantity shall be ascribed equal importance in higher education. Functions of teaching thus, are broadly classified as:

- a. Information presenting
- b. Communicating objectives
- c. Structuring the field
- d. Explaining difficult concepts and problems
- e. Motivating the student
- f. Developing critical thinking
- g. Developing alternative frames or reference
- h. Changing attitudes
- i. Encouraging originality
- j. Developing self-evaluation
- k. Developing ability to solve problems

Of these functions, (b) and (c) and possibly (d) and (e) are capable of being met by independent study if appropriate learning materials are provided. Rests of the functions are met through teacher-student interactions, in classroom situation.

6.2 PROBLEMS OF CLASSROOM COMMUNICATION

It remains a vital question to be answered; whether to perform classroom teaching to impart 'knowledge that transforms' the student or simply 'to secure a pass in examination' in the process of securing a degree. While education shall find wider avenues for the expression of the learner's full personality, unfortunately the students are looked upon as mere raw stuff on which teachers impose their views. Instead of facilitating the spirit of enquiry and dedication to the pursuit of knowledge, the monstrous sin of pride makes teachers commit gross perversions in the nature of students.[91] It is established beyond doubt that the purpose of communication is to empower and transform the receptor which applies to classroom teaching also, in which case the role of the educator is to lead the student to his own personal discovery thereby, meaning is acquired and learning happened, rather than they end up in mugging up of statements that are mere grammatical constructs.[5, 19, 21, 92]

Empowerment of receptors is facilitated by the happening of a dialogue between students and the teacher. Such a dialogue never happens unless the learner speaks through his own questions and awareness. The role of feed back is kernel in an effective, two-way classroom communication in order to assess how far the communicator has remained relevant to the learners. Further, teaching shall promote active enquiry by the students into various kinds of primary and secondary sources which contribute to learning. So too, it remains to be another serious problem in the academic world that teachers inducted to teaching without any prior professional training, frequently remain in isolation; in class rooms. Even more surprising is that, questions relating to learning and its innermost workings tending not to be the most

urgent professional concern of teachers or their superiors.[92] Merely to teach can then even mean somehow, by an odd paradox, not to be noticed as a teacher.

6.2.1 Lack of General Awareness

Lack of general awareness drives students largely disoriented, even before they could start listening to the lecture and get interested in it. Though, a general introduction; mostly in specialist words, is given often to mark the commencement of a topic, specific efforts are yet to be made which could mark the beginning with high impact. This pronounced ‘gap’ in achieving classroom communication could be mitigated to a great extent with the use of appropriate graphic tools such as posters in an integrated effort to mark the beginning with a high-impact introduction that sets the students well-oriented with the subject of the lecture.

6.2.2 Subject Language and External Empirical World

The relationship between the subject language and the external empirical world is to be transmitted in the student’s own language. In order to converge with the external empirical world, teacher has to enter into the student’s *frame of reference* and match the subject language used in communication with their own.[19] So too, any ‘personal bias’ of students often pose a stumbling block in classroom communication. Since the potency and ambiguity of everyday language are really one and also due to its very plasticity, ordinary language needs continuously to be restricted, to be made meaningful by being replaced in empirical situations and in the absence of such empirical replacements, language seems to take a formalistic life of its own. The absence of empirical support for language then might be responsible for the fact that

the use of everyday language tends to exhibit empirical bias so that they will employ plastic, everyday expressions in terms of real life situations they know, rather than in terms of formal concepts of the subject.[92] Though, in higher education, the specialist's knowledge which remains formalistic could be supported with empirical knowledge through extensive fieldwork, in the actual programme of the course there exist a wide gap. Getting out of the classroom to confront the real physical world will alter the relation between the learner and what he learns and would generate real-world empirical support for the abstract conceptual language. Instead, the physical world is oddly ignored in classrooms, especially through lectures that draw students from observation. Moreover, use of language as concept itself poses obstacle to student's genuine involvement in learning through their everyday language.

Attempts to return to the real empirical world does not free learning from its formalistic impasse, since the belief that 'subject knowledge is expressed through minimal grammars' often dominates the move from classroom to nature in an attempt to 'objectify' knowledge; the process of making knowledge an object through knowing, and coming to know, with its possession. So too, the practical difficulty in putting up models for concepts, especially when it is relational as in the case of architecture requires alternatives. The constitutive involvement of students is stressed since 'objective reality as a collective phenomena external to the body has to be subjectively realized before it has any meaning'. [21, 80, 93] Though, the objectivistic view of knowledge is particularly disposed to production of appropriate language of the subject, the objectivistic habits shall not lead to an exclusive language with minimal grammar since such an effort tends to view the language as an object

requiring overemphasis which undermines the message to be communicated.[19] Yet, if a conception of knowledge opposed to objectivistic views is to be entertained at all, it needs to confront any claim that an intellectual capacity resides in a language *per se*, considered apart from its use. But, studies prove that even the precise language used in mathematical activities has frequently been a compromise between what is mathematically correct and what conforms to normal English usage.[94] One cannot attribute meaning to a word if to him; there is no meaning for that word. The comprehensive learning by the learner as a 'maker of meanings', is achieved thanks to comprehension which is a matter of sampling surface structure; visual information of written language, in order to test predictions and resolve uncertainty about underlying meaning.[95] The listener does not extract meaning from the surface structure where there is no meaning till he supplies meaning by himself. Even 'brevity' shall therefore, not to be achieved at the expense of clarity, for it will hinder learning especially in the case of Architecture where a constant return to empirical world facilitates learning.

6.2.3 Problem of Jargons

A close group gets established through the use of specialist words, but it would also mean the elimination of others who are not familiar with such words and it prevents the language from being a natural vehicle for learning. Though, towards the final semesters; when the students get more professional in nature, the use of jargons would facilitate communication and foster the formation of the professional we-group, the use of specialist words during initial semesters might drive students disinterested due to 'lack of common' understanding, and might instill in them a kind

of *sang-froid* as resistance. Later, such students certainly evince a detachment from the class works. Hence, they are denied access to knowledge and prevented from sharing their own by those very practices which are intended to facilitate learning! Though, their disavowal might be expressed in humour and are not merely protecting themselves, they often find it genuinely funny since sometimes they do not have a clue of what is going on in the class, in spite of copying of notes. In most cases, the resulting closure is the manifestation of a lack of relation between the 'knowledge in architecture' and their 'own learning'. [92] In order to draw the attention of the student by generating interest in the communication, the educator shall avoid all specialist language but, prefer to use words that are familiar to the students and from their empirical world. Otherwise, students would feel disinterested and detached manifesting resistance that marks the very end of communication.

It is difficult to emphasize teaching, rather than look at knowledge or a student in isolation, especially when it comes to their encounters with academic knowledge. [96] A close relation between practicing in own life and theorizing conduces communication and learning. This relation between the 'learning and the learner' or 'own learning and knowledge' could be better established with the use of effective graphics in teaching. Moreover, graphics facilitate abstract thinking and enables one to construct own personal model of concepts that exist as a set of language forms. [20, 29] The constructive features of a language which establish a new signification in a linguistic apparatus constructed with old signs are embodied in the degree of correspondence between what is said, written and the constituted forms. [97] The absence of constitutive involvement contributed especially by a lack

of empirical understanding by students through their own everyday language would compel them to draw on empirical realities they know which would make their negotiations with language profoundly formalistic. Language is not knowledge neither it has knowledge preexisting as conceived in objectivistic thinking. But it has to perform as a natural medium of communication in the process of subjective realization where knowledge is awakened and realized. In such a process symbols act as 'generative and sustaining agents' of active dialogues, facilitating learning through joint partnership among teachers and the students.

6.2.4 Problem of limited referents

Empirical world provides the required feedback to restore any break in communication, resulting from lack of 'fit' in the relationship of the abstract with the empirical. If there is no continuous return to the empirical world in terms of students' own language, the potential flaw in classroom dialogue will stay hidden. Moreover, it leads to over-dependence on language at the expense of the message to be communicated. The danger of relying on a limited range of referents is that the recipient is likely to generalize from insufficient evidence and to assimilate non-essential and essential features of the object of discussion. Graphics, being relatively platform independent, is effective in mitigating the communication problems that could crop up in situations where there is a lack of 'expressive fit' with purpose and meanings. Similarly, teaching binary opposites is effective in making students understand key terms of a subject since the understanding of binary opposites facilitates formation of meaning in oneself.[31, 55]

6.3 LEARNER ORIENTED TEACHING

Any shift in teaching with a concern for learning does not accept the communication–learning fallacy which assumes that information transmitted to the student is always learned. Though this was an accepted basis of all discussions on teaching methods, later researches proved it lop-sided with ways of transmission of information to students without exploring closely what was learned, by whom, at what speed or for what purpose. Understandably, this lead to a passive attitude towards student response as the student is seen in a dependant situation, relying on the information thrown at him; whether through electronic media or ‘chalk and talk’.

Learning, on the other hand, is an interactive two-way process in which the role and experience of student are vital components. Here students contribute and also receive remaining active partners in teaching since their perception of what is happening and assessment of its value are as important as the perception of their teachers.[4, 98] Learner oriented teaching considers what experience will motivate students and enable them to learn, through what ways knowledge can be best structured for a given learner or group of learners, what sequences or modes will present the material most efficiently, what should be the nature and pacing of rewards or penalties and how students can gradually be moved from a reliance on extrinsic rewards to those which are intrinsic.[99] (Figure 6.1)

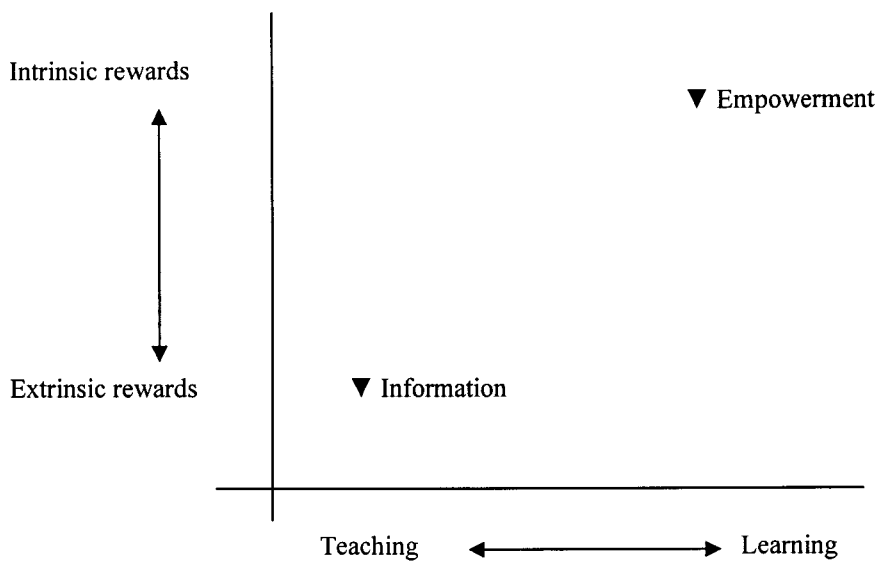


Figure 6.1 Teaching – *Learning*; *information to empowerment*

Learner-based system leads away from the conventional problems of teaching to much wider issues; to a theory of instruction that seeks to take account of the fact that a curriculum reflects not only the nature of the knowledge but also the nature of the knower and the knowledge-getting process where the line between the subject matter and the method vanishes off. Such a system facilitates the dynamic participation of learners that makes possible the transfer of knowledge resulting in learner-empowerment.[4, 7] The process of knowing with learner-orientation requires a positive change in the roles and interrelationships among teachers and students. Here the teacher himself becomes a learner because he learns more about teaching and the learner begins to assume greater responsibility for his own progress which in turn changes the ecology of the teaching institution by redefining its primary role in terms of learning.

6.4 METHODS OF TEACHING

The prevalence of overgeneralizations that exist in the studies on methods of teaching makes any such attempt less effective. These methods are normally classified into four, five or six categories on the basis of the size of the learner group and the presence or absence of the media.[4] Comparison of these methods has two basic assumptions as 'the variation between categories is much more important than the variation within categories' and 'there is no significant relationship between how one teaches and what he teaches'. The question of cost also influences the decision on effectiveness of any method. However, the dimensions that are decisive in the description and classification of teaching methods are the composition of the group, characteristics of its members, modes of interaction between members of the group, nature of the material resources available, modes of use of these resources and the time factors; *preparation time, contact time and follow-up time*.

6.4.1 Monologues to Dialogues

A constitutive involvement in the lesson seems to be established in a class when the learners are 'informal and witty' in their response; a positive learning situation for receptor-empowerment. Impertinence is normally unambiguous and an overt threat though it can be disguised as humour that is often ambiguous and a potential threat demanding extra care, be allowed for discussion to retain all its seriousness. Occasional questioning by an instructor in a class that is essentially monologic is treated as intrusive, as the random questioning only seeks to elicit the '*distribution efficiency*' of the subject language for which the teacher has custody. Despite the ease and informality, monologic nature creeps in if the communicator

maintains an objectivistic approach to the content. Such pedagogical practices with an underlying monologic relationship designate the teacher as a repository and the learner as an empty vessel. Moreover, a monologic class does not foster the art of asking questions which form the source of all knowledge, since questions that issue from some pressing, vital aspect of the learner's present situation often seems peculiarly revealing.

Permitting students to work on their own and to devise their own projects seem to have reversed the monologic relation from a content controlled by the teacher to a content controlled by the student. The better position that could be assumed lies somewhere between the objectivistic view which reduces the consciousness to being a reflection of the world and the idealist position which reduces the world to being a construction of the subject.[100] A dialogic learning begins when the expressions of interest of learners are articulated as questions that are revealing. Therefore, a dialogic relation treats even the personally important questions as constitutive of content. In such situations the exposure of an uncertainty that might have been self-censored gives release not just to the learner but also to the teacher, allowing him to speak directly in response to the demands of that uncertainty so that the statements he then makes are purposeful. The learners' release from uncertainty thus becomes the teacher's release from the intellectual structures he normally inhabits. The effect is of renewal of human and intellectual contact, a restoration of the power of both the teacher and the learner to speak back and forth perhaps, like friends talking together, not only to answer with truth, but to use only what the one who is questioned admits he knows, unlike the objectivistic structures that use only what someone else

knows.[4, 101] This means the necessity for a different set of pedagogical tools that foster dialogic relationships through communication and intensified learner-interest in the subject content which elevates the status of teacher from 'repository' to 'facilitator who has something to contribute' in an active dialogue. Yet, when students ask questions it is often seen by others as merely revealing a lack of knowledge and this detrimental social interpretation of meaning of questions imply that crucial questions may be censored and go unasked. But, for a dialogic relationship to prevail in a class, the teacher has to know what ideas and questions a learner has, how provisional or developed they are, how urgent, genuinely personal or quietly speculative or the like. A dialogic relation, thus, clearly depends on knowing the learner and their minds in a humane way and continuing to draw from such knowledge. Dialogue, as a species of conversation, clearly not gains from assessor posture on the part of the teacher and it seems as if it is finally the coercive etiquette of subject languages and their minimal grammars that keep the teacher and the learner from speaking openly about things that are in their minds.[92] Such a case reiterates the value of the illustrative, yet symbolic pedagogical tool for communication in sustaining classroom dialogue effecting learner empowerment.

6.4.2 The Learner Group

It is established through studies that student-centered discussions are superior to teacher-centered discussions in terms of communication efficacy, motivation, attitude change and conceptual learning which suggests that the 'mode of interaction' is a critical factor and the 'size of the group' sets the limits on possible modes of interaction.[4] Depending on the type of class the group normally consists of two; one

or no teacher and any number of students. Though, teacher-less situations are commonly found where small or large number of students work with the help of media. Learning also takes place in informal or planned meetings by students themselves.(Table 6.1) A student’s peers often represent the least recognized and most important of all resources available to him. Possible modes of interaction in the case with ‘only one teacher’ are limited by the size of the group though situations in which there are more than one teacher present, are quite common in architectural education, in which class, *design discussions* are included. In such discussions, more than one teacher having differing backgrounds and views participate and contribute. In every case, the distinguishable factors affecting teacher behavior include the knowledge he brings to the situation, the extent and nature of his teaching experience, personality factors and teaching skills. So too, students with differing characteristics, even if in a group with relatively homogeneous cognitive dimensions, require teaching methods that suit their differing personalities and learning styles.[102]

Table 6.1 *Classification by way of size of group with one teacher*

Number of students per group	Type of group
1 to 3	Tutorial
4 to 14	Discussion
15 to 32	Class
Over 32	Audience

6.4.3 Group discussions

Small groups frequently demonstrate a tendency to build up hypothesis, handle evidence to come to insights, construct their own questions and are largely capable of reflexive awareness of their own thinking.[103] In this process they use language to express interest, enquire, compare or theorize with, rather than using

language to get through the tasks without overall purposefulness, questioning and hypothetical orientation that are kernel in making a subject inductive.(Table 6.2)

Table 6.2 Type of Group; Description and characteristics

Group	Description	Characteristics	Recommendations
Tutorial	Smallest group for personal level interactions and learning.	Offers greatest flexibility in interaction between student and teacher. Feed back relating to standards of judgment become evident.	Appropriate to develop originality and problem solving ability in students. Avoid monopolizing a conversation by the teacher. Best suited to evaluate over-all performance and skills of a student and further guidance.
Discussion	Group of less than fourteen students interacting with one another. Group-centered layout for the class, preferably in oval circular shape.	Enhanced inter personal interaction. Students criticize one another resulting in <i>peer criticism</i> , rather than the teacher. Social skills become evident. Teachers tend to treat the discussion group as a class for they are used to that mode of teaching. Teacher-dominance will have detrimental effect.	Appropriate to encourage critical thinking, originality and to develop alternate frame of reference and to change attitudes. Teacher shall assume the role of a facilitator. Facilitate 'listening one another', by students and choose 'not to dominate' the students.
Class	Group of 15 to 32 students. Too large for students to question one another. Teacher-centered layout for the class preferably in rectangular shape.	Interaction is increased due to the lowered group size. Quite complicated interactions results in undivided class.	Split the class to smaller subgroups for effective participation. Supply handouts to facilitate information transfer and communication of objectives.

Audience	Group of more than 32 students. Too large for a teacher to maintain effective contact by any means other than lecturing and its size relatively is unimportant. No questioning of teacher and students on regular basis. Teacher-centered layout for the class preferably in fan shape.	Interaction is most constricted. Effectively teacher-less most of the time. Typical lecture situation with one-way communication and no eye-contact with students.	Teaching skills and dramatization are at premium.
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6.5 MATERIAL RESOURCES FOR TEACHING AND LEARNING

6.5.1 Lecture Notes - The Text

Though, lecture notes given in a class, be it dictated or as ‘hand-out’ are assumed to be of immense help to the students since it is a ‘reference to’ and a ‘record of the discussions’ of the subject. In reality students, especially in their initial years feel that these referential materials are intermittently comprehensible. This is especially true with referential texts due to its inherent referential function which implies something of *separation, impersonality and lack of warmth* and results in lowered teacher- student relationship built up otherwise, through an effective talk about the subject.[104] Often, such a text would develop a paradoxical situation where the text’s focus on content made it all the more difficult for questions to arise as to how the students handle its content. Moreover, since the text encapsulates bits of subject content and remains exclusively referential, it has an inherent need to be humanized; that it must somehow involve and reflect students’ everyday language. It simultaneously manifests a conflict between the ‘ruling orthodoxy of objectivistic assumptions and formalistic practices’ and the moments of dissent that attempts to

break its hold.[3] Material resources for teaching-learning process could be classified based on communication efficacy, into structured resources, unstructured resources and structuring resources.[4] While structured materials are used for communicating a body of content and unstructured materials is used for presentation of information; scholarly treatise is used for theory presenting. Whereas, structuring materials are used for information structuring. A multimedia-based, programmed instruction material might serve the purposes of some or all of the above material resources.

Table 6.3 Categorization of teaching-learning material resources

		Materials selected by		
		Learner	Teacher	Producer
Material controlled by	Learner	Project mode	Assignment mode	Learning package mode
	Teacher	<i>Independent Course that seeks the guidance of the teacher.</i>	Teacher presentation mode	Mediated teaching mode

On the basis of ‘who selects’ and ‘who controls’, the materials used in a teaching-learning are categorized into five modes as given in Table 6.3. The structured materials are most effective if the objectives of the course are knowledge, comprehension and application over a limited range of examples. Programmed learning resources give good evidence for this. In higher education, in the absence of structured materials, if time and cost does not permit the development of another; maximum preference may be given to structuring materials. The use of structuring materials such as statement of objectives, conceptual maps and graded assignments unless made detached and thought out in terms of student experience; tend to impart planned agenda to lectures rather than acting as important aids to independent study.

However, the use of unstructured materials are recommended if the objective of the course is for the application of principles and techniques to new kinds of examples and intellectual skills such as analysis, synthesis, evaluation or problem-solving since it is important for the student to generate his own structure.

A carefully planned destructuring with highly structured first-year courses and relatively unstructured final-year courses would be most appropriate to achieve the objective of ‘learning how to learn’ which could be catalyzed by the prudent use of structuring materials. Thus, it could be found that in all phases of teaching-learning, use of conceptual maps depicting relations with the field, appropriate symbols and graphics are of immense use in effecting communication and interaction as illustrated below.(Figure 6.2)

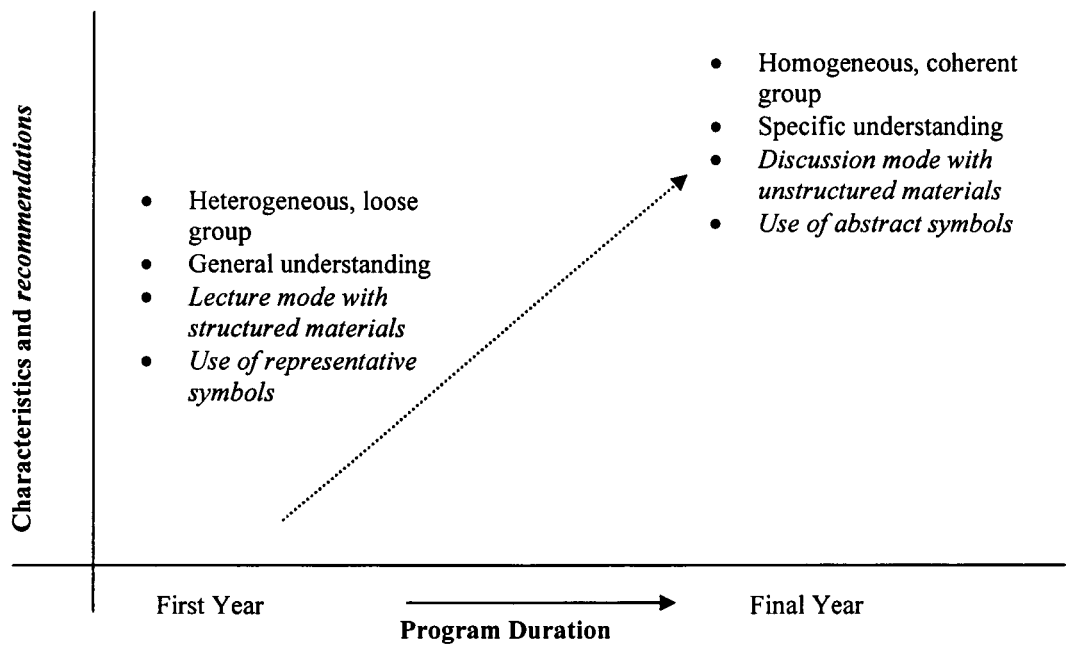


Figure 6.2 *Characteristics - program duration relationships*

6.6 TIME FACTOR IN TEACHING-LEARNING PROCESS

Teacher's explanation is usually couched in a language which is time-conscious as students' speech is often interpreted more for its temporal features. It is also relevant that judgments about 'spending too much time on one thing' suggest that such things have an intrinsic temporal value. This hyper-awareness of time is partly induced due to the teacher's feeling of being trapped by forty-five to fifty five minutes deadline.[21] Closure has a temporal aspect in that the teacher's view of what happened is shaped by considerations relating explicitly to time. Further, handling of time towards the end of a lecture tends especially to be crucial when teacher treat lessons as grammatically constructed for it is important to tell all these to get the message across. Therefore, tangential discussions are often treated as gossips or digressions having low value in regard to learning. Thus, teachers fail to develop 'openness of eye' and lack proper observation of what students really need for their minds are clouded by the significance of their subject materials.

Closure refers to the way in which students are denied access and use of their own capacities; their language and things they already know.[92] It might be brought in, if the receptor's response is left 'not fully grasped' lest ignored and their known vocabulary or the empirical world to which they are familiar, which is quite likely with the objectification of language. Questioning the subject taught, sustains a dialogic relationship between pupil's consciousnesses and the subject knowledge for there can hardly be any knowledge without knowing. So too, ignoring an item of knowledge brought forward by the student, instead of focusing on it, at the right time does not amount to learning for deferral never accompanies any enlightenment. When

tasks are timed, time itself is turned in to a commodity rather than context and the real orientation will be to that commodity; time, leaving the task-orientation wasteful and lacking in urgency. This would rather develop into a tension between the temporal demands of the course and the temporal horizons of students struggling to understand; a tension that seems to manifest more often in initial years.

The “*sensed duration of tasks*” as summarized by Fraisse, “*decreases as the tasks are less broken up*” and “*the more unity a task has, the less time it seems to take*”, for partial changes are no longer in the foreground of our attention. Further, he also relates “*absorption in the elements of tasks to a diminished sense of overall purpose: instead of considering each element of the task itself one can concentrate on its purpose*”.[105] Sustained presence of signification of the subject of a lecture throughout its period is preferred over the break up of the lecture into its sub-tasks, for the presence of subtasks in the foreground of attention is likely to diminish the possibility of the students ‘grasping the essential point’ of what they are doing. Graphical tools like posters could effectively perform this task of sustained significance facilitating learning. Any lengthened sensed duration of overall task would complicate communication due to the generated tension between sensed duration of overall task and the sense of its purpose that is implicit in the ‘temporal horizon’ of the teacher.[92]

Time lies at the point of intersection of conflicting interests which also forces teachers to be over-conscious of time, manifesting blind-eye to the needs of students. Teachers spend time in contact with students and in preparation which can be divided

into *time spent for immediate preparation* each time a course is taken and *time spent in long-term preparation* which need not be repeated until they so wishes to revise that part of the course.[4] When the long-term preparation is pursued systematically, it results in a course development. While it is almost meaningless for the student to consider time factors at teaching mode level, it may be beneficial to consider the student-time at the course level; both in terms of ‘total time he spends’ and of ‘his allocation of time’ to different learning activities.

The studies of the problems of classroom communications and the urgent need for a shift in paradigm of the pedagogy establish that symbolic communication is vital for learner empowerment. Since symbols have inherent power to generate and sustain interaction amongst the participants in classrooms, their use through appropriate tools of communication is most desired in learner-oriented teaching where the teacher himself becomes a learner because he learns more about teaching and the learner begins to assume greater responsibility for his own progress, changing the ecology of the teaching institution by redefining its primary role in terms of learning. Further, communication through symbols and criteria for enhancing their communicational efficiency are elucidated in Chapter Seven.

7.0 COMMUNICATION THROUGH SYMBOLS: STUDY AND ANALYSIS

Semiology or semiotics is the scholarly term for the science of signs and symbols. Symbol is defined as something that stands for or represents or denotes something else especially a material object representing something immaterial or abstract.[2, 16, 27] It is a thing regarded by general consent as naturally typing, representing or recalling something by possession of analogous qualities or by association in fact or thought. These could be objects, activities, relationships, events, gestures or spatial units in ritual context where they are involved in social processes as factors in social action and positive forces in an activity field. They represent in physical form, something that is non existent and are the best possible expressions of a relatively unknown fact.[16, 31, 71] Symbols have their significant contexts, external forms with observable characteristics and interpretations offered by both specialists and laymen. They produce actions and the dominant symbol has a tendency to be the focus of communication and the resulting interaction. Symbols condense things and actions in a single formation and the dominant ones function to interconnect and polarize meaning.[16] Symbols are used in communication prior to speech and the *symbolic* is indeed human; yet considered primitive; that which is

characteristic of the basic human nature. Symbols have already evolved to the point of universal acceptance in such areas as music, mathematics and many other branches of science. In the contemporary context, the developments in symbolic communication trace its roots to the developments in the swift transportation systems which demanded almost instant communication to the high-speed travelers. These swiftly integrating solutions to traffic problem solving has induced the invention of a wide variety of novel symbolic forms. The same is the case with television animation, which tends to generalize conceptual modeling. Functional graphic symbols stand for written characters or marks used to represent something; letter, figure, or sign conventionally signifying specific objects, processes etc. Such graphical symbols are older than words and found in every culture, however primitive they are. Owing to the multiplicity of definitions for symbols and their associated meanings; for the purpose of this research symbol is defined as a signifying graphic equivalent of the signified.

While these definitions uphold the basic purposes of symbols; in architecture, symbols mean a lot more. Symbols could be used to communicate things at one end, also be effective in communicating abstractions, emotions, feelings or even beliefs and philosophies on its extreme. Graphical Symbols that are an advanced version of sketches, figures, forms, color or any combination of these is also simple enough to facilitate easy perception and comprehension. These are further highly representative of the item discussed and they induce vivid visual images in the minds of receptors. In a sense, symbols represent effectively any item being described; especially with layers of embedded meanings. The communicational efficiency of such symbols depends on how universal or platform-independent they are as in the *Roussel-Uclaf* symbol by

Raymond Loewy; composed of three identical parallelograms, arranged symmetrically within an equilateral triangle generating a similar triangle in the centre which is incisive, balanced, and open. Yet, its nature does not represent any particular specialization but fosters the group identity and extends it beyond the confines of the pharmaceutical industry. Through the developments in science and technology, the visual language tends to bring its communication means closer to universal use and comprehension by increasing its communicational efficiency.

7.1 ADVANTAGES OF SYMBOLS

Symbols are quicker in the dissemination of meaning in communication as they are easily perceived and comprehended. They are generally platform-independent; more peoples understand what they communicate as evidenced in the case of Olympic symbols. Moreover, they are small enough to be accommodated at places where written instructions would be too small to be legible or even not possible. Symbols being abstract, require involvement and interpretation by its receptors thereby it causes the well cherished learner participation resulting in their empowerment.

7.2 TYPES OF SYMBOLS

Though there exist numerous types of ambiguous classification among various spheres of graphic application, symbols are broadly classified into two; representational and abstract or arbitrary.

7.2.1 Representational Symbols

Representational symbols, otherwise known as figurative symbols present fairly accurate and simplified pictures of objects or action.[2, 106] Silhouette of an airplane to indicate airstrip or animal sign to indicate animal crossing on the road are examples of representational symbols. The most visually pleasing symbol systems tend to be those concerned with a single classification of recognizable images, such as sporting events and animals.[3, 25]

7.2.2 Abstract Symbols

Abstract symbols, otherwise known as nonfigurative symbols reduce essential elements of a message to graphic terms. These may once have been representational but have become simplified by repeated design efforts, in its complexity over a period of time to what they now are; only as symbolic indications. Nonfigurative images contain no reference to perceived objects. They are devoid of subject matter and may be called pure shapes or forms arising directly out of designer's imagination. Two basic nonfigurative classifications may be noted: *Geometric* and *Amorphic*, along with these, other combinations of the two also exist.[106] Certain religions have design traditions that offer a rich compendium of nonfigurative designs and motifs since there exists religious prohibitions against portraying human or animal figures. Most cultures combine the figurative and nonfigurative images. The nonfigurative motif induces free flights of imagination, unhampered by subject demands in its receptors. Abstract symbols are basically invented and hence need to be learned by the receptors. Mathematical and zodiac signs are fine examples of abstract symbols.

7.3 CRITERIA FOR SYMBOLS FOR ENHANCED COMMUNICATION EFFICIENCY

Any symbol intended for communication to a heterogeneous receptor group shall be in its simplest form, maintaining the closest signification and resemblance to the signified. Such a symbol meant for communication to heterogeneous receptors loses its communicational efficiency if it gets complex in its form, deviating from its basic shape; the most reducible form, or in other essential characteristics. Reduction of complexity in form shall be achieved by way of using basic shapes, lowered textural effects, shades and shadows or color, avoidance of bias and use of standardization.

Most designers tend to make a graphic symbol complex by ascribing it an ornamental function. Though making a symbol ornamental would amount to its value addition, in many respects it would bring down its value especially as a communicative tool. Stripping the symbols off any ornamental function which they might assume would result in those that are primarily communicative and inherently aesthetic. A second way by which the symbol loses its communicative efficiency is making it sculptural even by manipulating its scale or proportion. Any attempt to make sculpture out of symbols by way of altered size or scale would result in reduced communicational efficiency. Size and scale of symbols shall be appropriate to the purpose for which it is used and not simply a matter of aesthetic concern since it ceases to be meaningful if it turns impractical in accordance with Wagner's principle.[3] Thirdly, the materiality of a symbol facilitates right thinking for it induces cues specific to each material emanating from the texture, colour or the like.

The meaning ascribed to a symbol could be affected by the materiality of its making. Just as the materiality could be used to evoke appropriate meaning, if used otherwise, it might evoke wrong meanings. Fourthly, Elimination of any potential bias by way of form characteristics, cultural specificity or color association, is essential for enhancing communicational efficiency of symbols. Abstraction is brought into symbols by way of geometrical forms and transforming amorphous shapes through digital technologies. Such efforts facilitate efficient storage, retrieval and manipulation of images. Fifthly, standardization of symbols improves communicational efficiency through enhanced readability and acceptance, especially in dealing with heterogeneous receptors. Use of grids, standard formats including size of image facilitates standardization of symbols.

Therefore:

$$\text{Communicative Efficiency of Symbol} \propto \frac{1}{\text{Complexity of Symbol}}$$

Or

$$\text{Communicative Efficiency of Symbol} \propto \text{Simplicity of Symbol}$$

Simplicity of any symbol means the form to its most reducible one and expressed geometrically so as to enable use of computer and other means of mechanical production.[3, 90] *A symbol in its reduced basic form retains only its communicative function and no other including ornamental function; yet, remains aesthetic.* Outline is the simplest representation of an object in two dimensions. A

solid outline; a silhouette, or its negative and the flat background shape, are the primary elements of graphic design.(Figure 7.1,2) The Japanese woodblock print best demonstrates the effect of outline, background and silhouette. Reversing lines or letters out of a dark area or overprinting dark on light are two main sources of graphic variety.(Figure 7.3) Outlining of an image could be done using appropriate graphic software, with ease and precision. Though a symbol could be made more meaningful by way of alternative colour, modified proportions or any other chosen aspect, when the intended receptor group is homogeneous; these could only reduce its communicative value to a heterogeneous receptor group.



Figure 7.1
'Rowntree's Elect Cocoa'
Poster 1895
Beggarstaffs

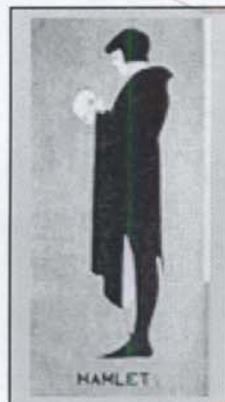


Figure 7.2
Hamlet-Poster design
1894 Beggarstaffs



Figure 7.3 *'Federazione Italiana Inks'* 1899-1900
Marcello Dudovich

Complexity of a symbol is ascribed due to its shift from the basic communicative function to more of ornamental function. Though, using symbols for ornamental function is appreciated; as in the case of *Wiener Werkstatte* with the repetitive use of squares as an ornamental motif almost indiscriminately, it shall remain communicative first and foremost.

7.3.1 Criteria: from form to symbol

1. Is the form signifying the signified, with respect to predominating characteristics?
2. Is the form the reducible basic?
3. Is the form geometrically expressed?
4. Are the materiality; texture, grain and colours, signify the signified, with respect to the predominating characteristics?

The rule for learning; *from the known to the unknown*, could very well be applied for the fixing up of criteria for choice of symbol type for effective classroom communication which is '*less homogeneous the receptor group is more the use of representational symbols*'. Gradually; as the receptor group becomes more familiar in terms of language and develops shared knowledge, the use of abstract symbols could be effective. Such a selective approach to choice of symbols facilitates learning in the most natural way.

7.4 STUDY AND ANALYSIS

Extensive surveys are conducted among students of B. Arch programs in various Indian schools of Architecture, in order to bring out the problems existing in classroom communication among students and teachers, in architectural studies. The results of these studies are tabulated and presented below.

7.4.1 Survey 01

Aim: The survey is intended to assess the problems of communication in teaching Architecture to a body of students with varying,

heterogeneous background. The term *Architecture* encompasses Architectural Design, Theory of Architecture, History of Architecture and other Design subjects. The sample selected for the study is a group of B. Arch students from different schools of Architecture in India. These students have undergone various phases of training in Architecture and are familiar with the terminology and the communicational problems in architectural education. A sample questionnaire is given in *Appendix 05*.

Number of students interviewed = 200

Results of Survey 01:

1) *Have you had any problem of understanding lectures in Architecture?*

Yes = 99 / 200, (50%)

The very high percentage is establishes the urgency of the situation existing in classroom communication. Further, it requires the use of appropriate tools for classroom communication which would result in learner empowerment.

2) *Do you clearly understand the terms used in Architecture?*

Yes; 60% or more, terms understood clearly = 99 / 200, (50%)

3.a) Means by which students verify 'what they understood' is 'what is meant'

It is interesting to note that only 28%, of students resorted to *peer-verification* or *teacher-consultation* for clarification of doubts. The very poor percentage is indicative of lowered interpersonal interaction and learner empowerment in classrooms teaching. Other means to enhance communication as recorded in the survey are: concentrating to the possible extent, discussion with professionals, consulting reference texts and other resources including libraries and personal observation and studies.

3.b) Reason for lack of communication as recorded by the students are:

Lack of clarity and legibility of explanation, Use of jargons, Incomprehensibility, lack of familiarity with terms, Lack of illustrations and sketches, lack of relevant examples and relation with empirical world.

4) Suggestions for improving classroom teaching of Architecture are:

Slide shows, Symbol assisted lectures, Informal and interactive classes, Participatory classes and discussions, Use of simple language and illustrations, Use of visual and graphical aids.

5) Problem of communication in Mathematics / Engineering subjects?

Students registered problems in classroom communication even in Mathematics and other engineering subjects that use symbolic language to the tune of 33% which is comparatively much lower. The better communication is despite the fact that the language used in mathematical activities has frequently been a compromise between what is mathematically correct and what conforms to normal English usage.[94]

6) Further, 97% of the students agreed that the use of graphics and symbols would improve classroom communication. Thus, the higher communicational value of symbols would enhance classroom communication in other relational subjects also, once put to use.

7) Nature of terms used in architectural communication:

While 77% of students agreed that the terms in architectural communication are subjective, 84% opined that the terms are relational in nature. The relational and subjective nature of terms, calls for a symbolic tool that makes the communication even more interactive.

8) Use of symbols and posters with symbols representing terms:

93% of the students agreed that symbols and posters with symbols having proven communicative power would be of definite advantage in improving classroom communication, especially in architectural education. Further, individually oriented, informal and participatory classes where the teacher constantly encourage the learners to make their own discovery and use of familiar language and vocabulary which is of the learners would enhance learner empowerment.

7.4.2 Survey 02

Aim: Exhaustive questionnaire surveys are conducted among students of B. Arch in various Indian schools of architecture to find out the problems of communication in design discussions in studios. Moreover, the students were asked to write down all words which they found difficult to understand in the course of the Programme in an effort to generate a list of words to be used for symbol making.

Number of students surveyed = 211

Students surveyed registered much lower; 34%, communicational problems in design discussions in studios. Better communication recorded in this case is solely attributed to the personalized nature of discussions in design studios. Moreover, the design studios with larger student-staff ratio provides for better interaction, especially through sketches and illustrations. Results of the study indicate that in spite of the positive situation that prevails in design studio a wide gap in communication exists. This gap could be bridged only through increased levels of interaction and better understanding that springs from a common vocabulary; communicated by words

assisted by symbols. The students are further asked to write down words that they found difficult to understand in an effort to create a list of terms. The list of words thus obtained at random is further refined to eliminate repetitions and the final list, ‘*List of words*’ is generated.(Table 7.1) The list thus generated is used for developing symbols which they signify.

Table 7.1 Raw List of Words

1	Additive
2	Aesthetic
3	Analogous
4	Anthropometric
5	Arcade
6	Architecture
7	Articulation
8	Balance
9	Blocking
10	Buttress
11	Canopy
12	Chromatic
13	Compliment
14	Composition
15	Concept
16	Contour
17	Contrast
18	Deconstruction
19	Dialogue
20	Dome
21	Ekistics
22	Ergonomics

23	Ergonomics
24	Façade
25	Formal
26	Gradual
27	Grain
28	Harmony
29	Hierarchy
30	Hue
31	Humane
32	Identity
33	Illumination
34	Informal
35	Interlacing
36	Legibility
37	Light well
38	Massing
39	Minimalism
40	Monotonous
41	Monotony
42	Negative
43	Order

44	Ordering
45	Organic
46	Orientation
47	Pattern
48	Perspective
49	Picturesque
50	Proportion
51	Proximity
52	Resilient
53	Response
54	Rhythm
55	Rhythmic
56	Robust
57	Rough Texture
58	Roughness
59	Scale
60	Sequence
61	Shade
62	Shadow
63	Smoothness
64	Space
65	Spatial

66	Sustainable
67	Symbolism
68	Tactile
69	Tangible
70	Textural Variation
71	Texture
72	Threshold
73	Tint
74	Tone
75	Transition
76	Transparency
77	Undulating
78	Unity
79	Urbanization
80	Vernacular
81	View
82	Vista
83	Visual Roughness
84	Visual Tension

7.4.3 Survey 03

Further, a survey was conducted among a group of sixteen professional architects to elicit their approach and goal in designing built forms. Questions were also targeted to identify an effective teaching method to impart design skills in architecture. Results of the same are given below:

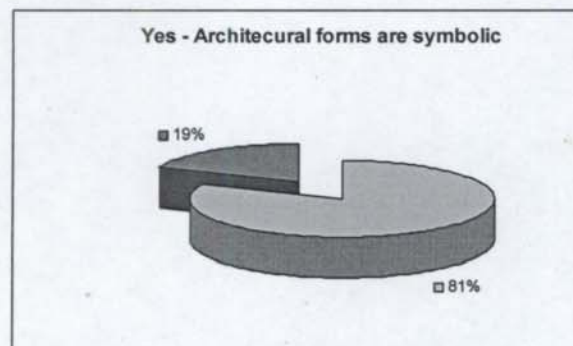


Figure 7.4 Survey Results - Professionals

All the professional architects expressed that architecture is a form of communication and 81% agreed that it always remained symbolic.(Figure 7.4) Over and above the functional and performance requirements, architectural forms manifested the culture with its values and symbols of the people to whom it belonged. The symbolism in architecture could be seen in its form, style, character and even in its entirety. Therefore, architectural forms are silent yet eloquent declaration of the culture and the times to which it belonged.[46]

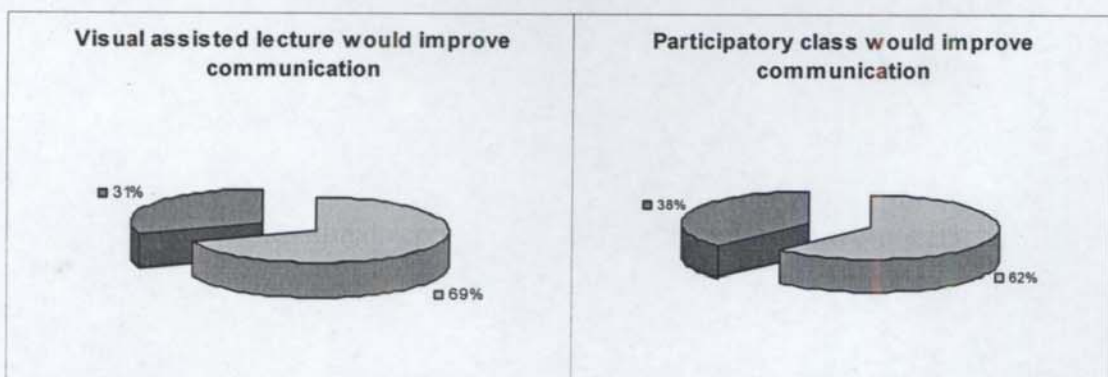


Figure 7.5 Survey Results - Professionals

While 69% expressed the view that “*Visual assisted lecture*” would improve the classroom communication and 62% were of the opinion that the design classes should be “*Participatory*” in nature in order to improve communication.(Figure 7.5) Participatory classes would improve communication because of the relational nature of the messages involved.

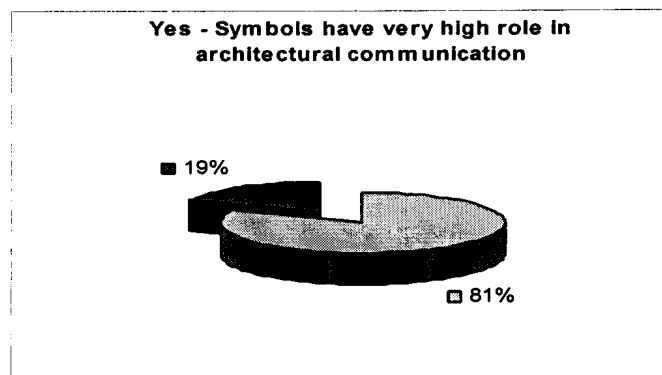


Figure 7.6 Survey Results - Professionals

81% of the professional architects opined that since architecture is largely “*spatial communication*”, symbols have a very high role in architectural communication.(Figure 7.6) To understand and transmit the knowledge of architecture, therefore, the teacher of architecture shall know its embodied symbols and symbolism. The studies also establishes that the sources of symbols could be Nature with its myriad of forms, culture with its values and traditions, existing architecture; be it heritage or contemporary, art forms and even abstract geometric forms. Moreover, *Nature* is as a potential source for symbols that has the lowest levels bias. All other sources like culture or an even abstract form possesses higher levels of bias. Therefore, a natural source is identified as a dependable source for symbols that have higher impact and communicational value, especially in communicating to heterogeneous receptors.

8.0 DEVELOPMENT OF GRAPHIC EQUIVALENTS

Graphic equivalents; symbols, for the words in the identified '*List of Words*' in architecture has to be representational and simple enough to facilitate understanding by the students, especially in communicating to those who are in the initial years. Words are chosen at random from the developed '*List of Words*' that consist of words suggested by the students surveyed which are used for the development of appropriate graphic equivalents. Thus, the word 'texture' is selected at random, for further study and development of its appropriate graphic equivalent.

Considering the heterogeneous nature of the student group in the initial years and their familiarity with the nature and the elements of nature which remains more or less consistent over the different regions of the land, an object from the nature is selected as the source object. Nature also provides a dependable source of objects that could be used in the development of graphic equivalents with least bias, which also enhance the 'fit' in the relationship of the taught abstracts with the observed empirical world. Therefore, the nature and natural elements that surround and dominate the context of receptors are identified in accordance with the studies earlier conducted, for selecting potential elements that would be useful in the generation of graphic equivalents.

Texture by definition describes the quality of any surface. The textural quality is broadly classified into rough texture and smooth texture. Texture conveys notions regarding the nature and characteristics of the material, its tactile performance and resulting architectural quality. In addition to physical textures there are visual textures too. Visual textures are often found in the context of landscapes where specific characteristics of soft materials like plants generate apparent smooth or rough visual appearance. Factors that contribute to the visual textural quality in landscape are the size and shape of leaves and foliage, the habits of the plant and the percentage exposition of twigs or other hard elements in the foliage.

8.1 SYMBOL FOR ROUGH TEXTURE – THE PROCESS

An appropriate symbol type has to be developed to signify effectively ‘rough texture’. Considering the receptor group that consists of relatively fresher-students belonging to first and second years having lower levels of exposure to Architecture, *Representational symbol* type is chosen. The representational symbols are simple enough to evoke vivid signification by the form similarity, especially in the predominating nature. They are also the reducible basic forms which facilitate easy understanding. Mostly, representational symbols are obtainable from the form outlines or the silhouettes generated from digital images of selected natural objects as elucidated in the methodology developed.(Table 8.1)

8.2 METHODOLOGY FOR DEVELOPMENT OF SYMBOLS

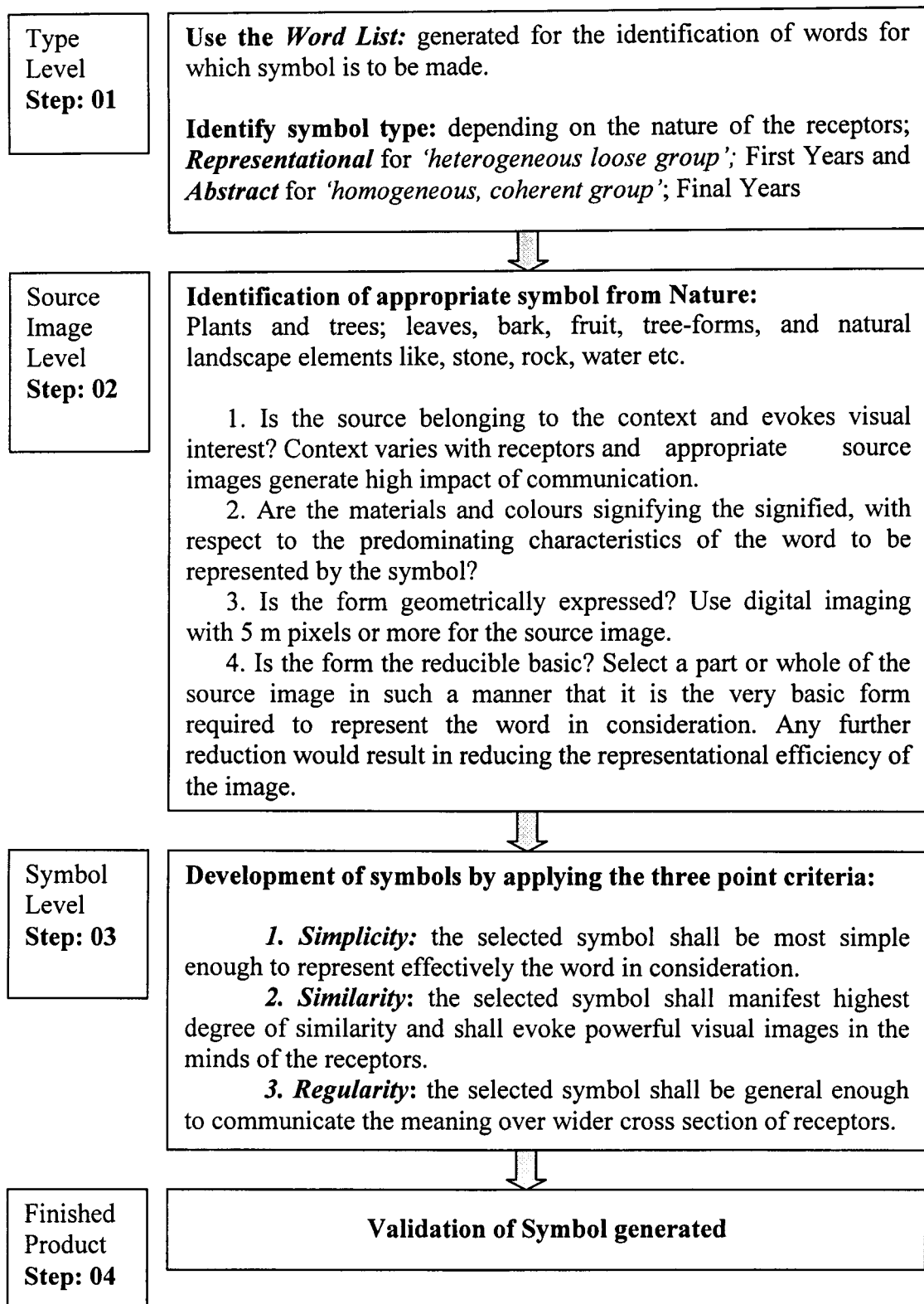


Table 8.1 Methodology for the development of symbols

8.2.1 Criteria for the objects to perform as source objects for Symbols

Objects from nature are chosen to evoke vivid image of roughness in texture. Since *Representational symbol* type has a direct representational quality, it requires a source that signifies fairly accurately the word in question for easy understanding by the students. The source object shall possess the characteristics and the same characteristics have to be consistently maintained even in its details. While choosing natural objects, those *belonging to the immediate surroundings* are given preference. Secondly, *objects that evoke higher level of interest* are given preference due to their higher chances of being registered in the minds of the users. Thirdly, that object which dominates *the visual environment* is selected for such elements create higher level of familiarity.

8.3 DEVELOPMENT OF SYMBOL FOR ROUGH TEXTURE

Though appropriate symbols could be drawn manually and reproduced mechanically, a better and more efficient method is to make use of the enormous potential of digital photography, image editing software and digital printing.(Table 8.2) The digital images and data could be stored and retrieved easily and efficiently. Moreover, if properly catalogued, these symbols could be used in generating one's own teaching and learning resources in architectural education by teachers and students alike. The object chosen to represent rough texture is '*Jack fruit*', which is a fruit that generates great visual interest.(Figure 8.1) Digital image of the source object is captured using *Nikon Cool Pix 5800* digital camera. The digital image is further simplified by the use of image editing software "*Adobe Photoshop*" to generate the symbol.

Example 1: Development of Symbol for Rough Texture – Application

Type Level Step: 01	ROUGH TEXTURE: An appropriate symbol type has to be identified to effectively represent rough texture. Considering the receptor group that consists of relatively fresher having less exposure to Architecture, <i>Representational symbol</i> type is chosen. This symbol type has more direct representational quality and therefore presents fairly accurate image of <i>Rough Texture</i>.
Source Image Level Step: 02	Identification of appropriate symbol from Nature: 1. Is the source belonging to the context and evokes visual interest? Yes. The object chosen to represent rough texture is dried coconut shell in inverted layout which belongs to the <i>immediate context</i>. 2. Are the materials and colours signifying the signified, with respect to the predominating characteristics of the word to be represented by the symbol? Yes. The dried coconut shells project a <i>very rough textural quality</i>. 3. Is the form geometrically expressed? Yes. Image is taken with Nikon Cool Pix 5800. The digital image is <i>geometrical</i> and it offers possibility for image editing. 4. Is the form the reducible basic? Yes. Reduction is achieved by the use of “<i>Adobe Photoshop</i>” in order to generate the image that is <i>reducible to the basic</i>.
Symbol Level Step: 03	Development of symbols by applying the three point criteria: 1. Simplicity: selected symbol shall be simple enough to represent effectively the word in consideration. Therefore, a part of the image is carefully chosen so as to represent textural quality effectively. 2. Similarity: selected symbol shall manifest highest degree of similarity evoking powerful visual images in the minds of the receptors. The simplified part image generated is made <i>black and white</i> to reduce complexity and any possible color - association. 3. Regularity: selected symbol shall be general enough to communicate the meaning to heterogeneous receptors. Further, the abstract quality of the image enables the receptor to perceive the characteristics of roughness rather than the actual object.
Finished Product Step: 04	Validation of Symbol generated: symbol for texture is validated through a survey conducted among 160 students and teachers.

Table 8.2 Methodology for the development of symbol for rough texture

The simplified graphic equivalent is further reduced to 'black and white' in order to reduce complexity. Simplification of image to 'black and white' mode avoids any possible color association or bias and enhances communication efficiency. Abstraction is induced in the image by appropriate selection of a part rather than the full image. It is important to ensure 'good fit' in the part selected, if communication is to happen through effective signification. Further, the abstract quality of the 'image in part' that is the graphical equivalent that enables receptors to perceive the characteristics of roughness rather than the actual object.(Figure 8.1.1)

The same procedure is adopted for generating symbols for *Contrast, Balance, Gradual, Harmony, Shade, Dialogue, Arcade, Tactile and Visual Roughness*, using the identified source objects.(Figure 8.2-10) An additional Eleven more symbols are developed for radial, picturesque, contour, tangible, transition, rough texture, analogous, transformation, aesthetic, resilient and hue which are included in Annexure 02.

Example 01: Rough Texture

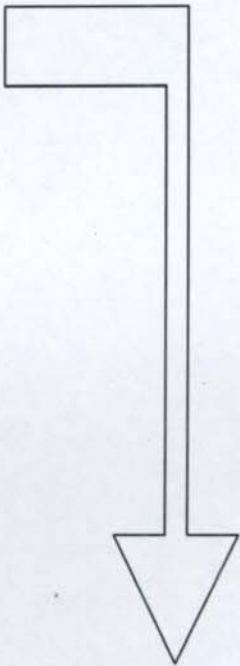


Figure 8.1
Source figure for Rough Texture

Object: 01

Rough Texture

*Jackfruit with its typical
rough and spiky surface texture*



Symbol Generated: 01
*Simplified yet abstract; imparting strong
textural images*

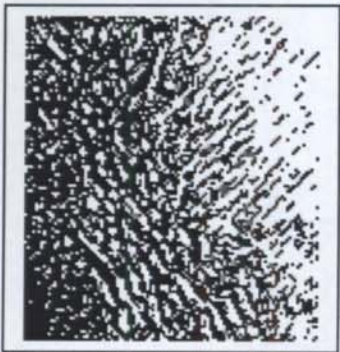


Figure 8.1.1
Symbol for Rough Texture

Example 02: Contrast

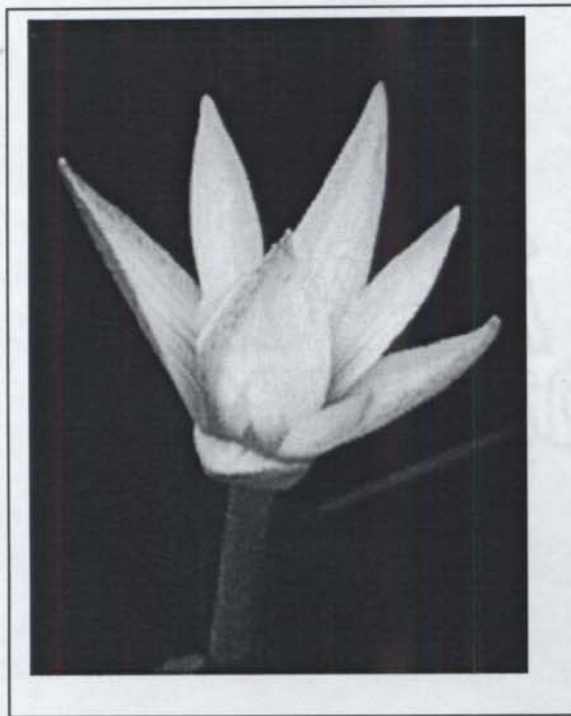
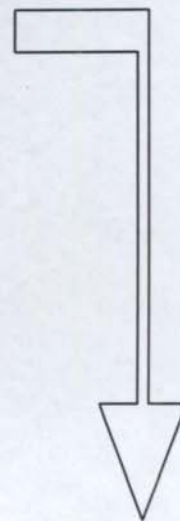


Figure 8.2 Source for Contrast

Object: 02

Contrast

Lotus flower; in contrast to its context by way of form, color and character



Symbol Generated: 02

Contrast: In the visual arts, the juxtaposition of different forms, colours, etc., to heighten the total effect



Figure 8.2.1
Symbol for Contrast

Example 03: Balance

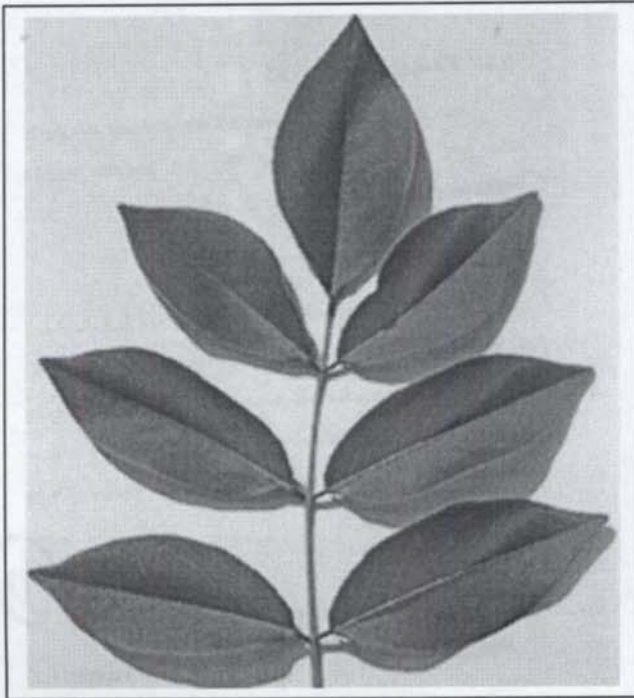


Figure 8.3 Source for Balance

Object: 03

Balance

Konna leaf



Symbol Generated: 03

*Simplified yet abstract, imparting strong
image of natural balance*



Figure 8.3.1
Symbol for Balance

Example 04: Gradual

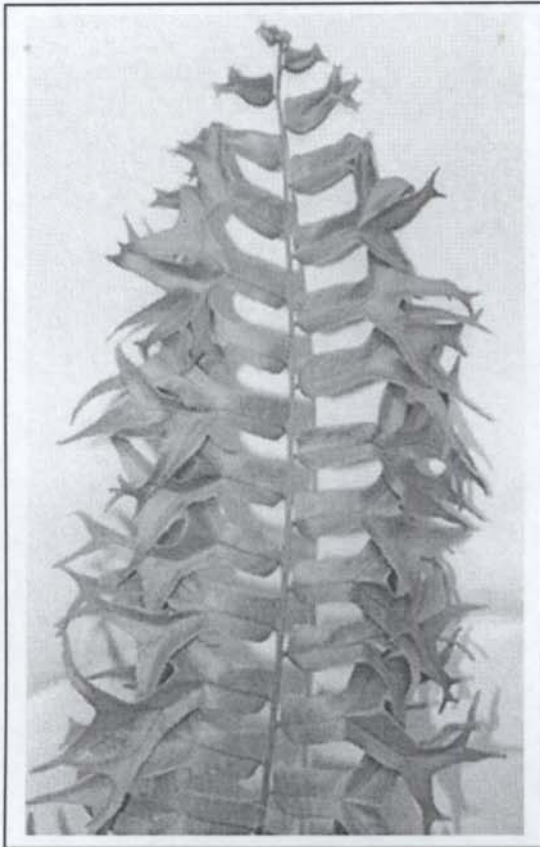


Figure 8.4 Source for Gradual

Object: 04

Gradual

Fern leaf: being gradually transformed from one to another



Symbol Generated: 04

Gradual: The action of taking place slowly and progressively; in degrees, indicating change. Gradual has implied direction; up or down, towards or away etc.



Figure 8.4.1
Symbol for Gradual

Example 05: Harmony

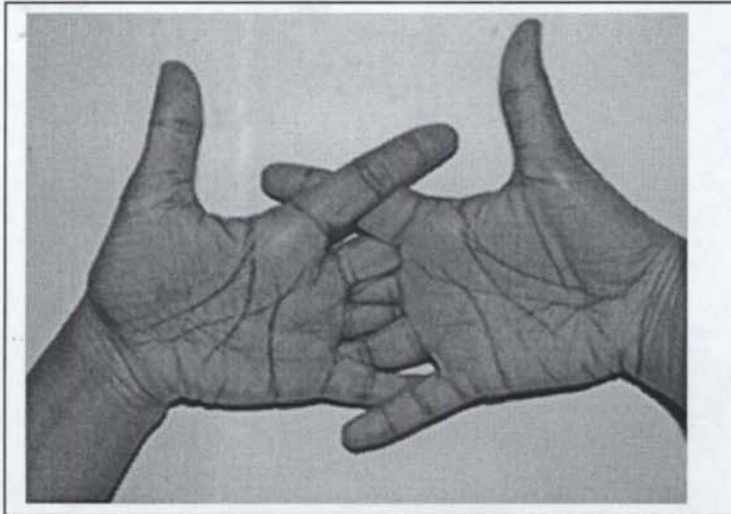


Figure 8.5 Source for **Harmony**

Object: 05

Harmony

*Hands that are joined
in harmony with one
another*



Symbol Generated: 05

*Harmony: Combination of elements so as to
form a consistent and orderly whole.*

Figure 8.5.1
Symbol for Harmony

Example 06: Shade

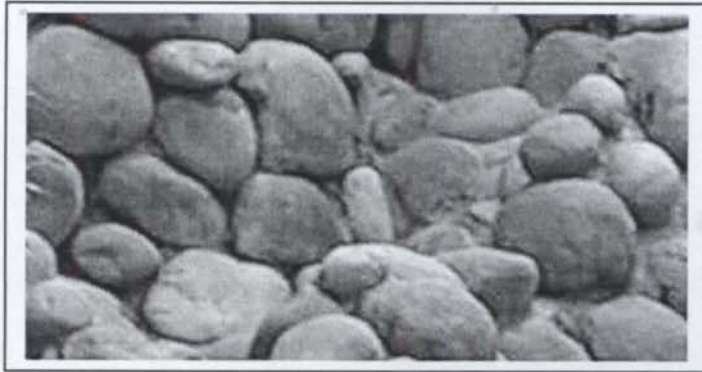


Figure 8.6 Source figure for *Shade*

Object: 06

Shade

Cobbles set in landscape



Symbol Generated: 06

*Partial or comparative darkness caused by
shelter from direct light*

Figure 8.6.1 Symbol for *Shade*

Example 07: Dialogue

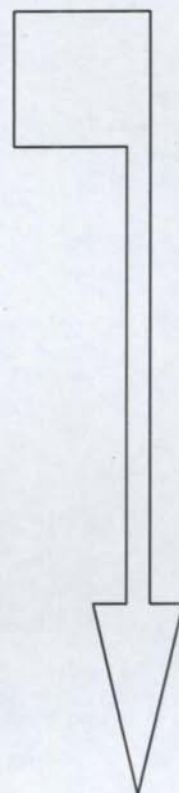


Figure 8.7 Source figure for Dialogue

Object: 07

Dialogue

*Trunk of a tree in dialogue with
shrub...*



Symbol Generated: 07

*Verbal interchange of thought; a
discussion, empowering one another*



Figure 8.7.1
Symbol for Dialogue

Example 08: Arcade

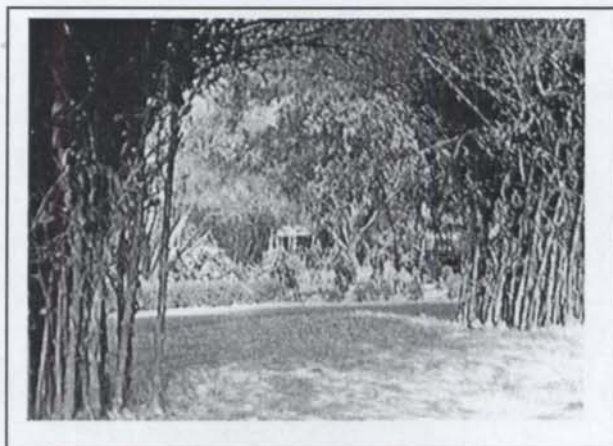


Figure 8.8 Source for Arcade

Object: 08

Arcade

Arcaded growth of bamboo



Symbol Generated: 08

Arcade: A passage arched over by a series of arches

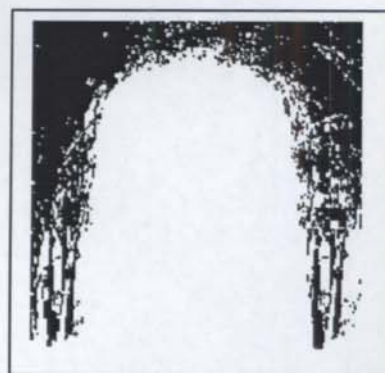


Figure 8.8.1
Symbol for Arcade

Example 09: Tactile



Figure 8.9 Source figure for Tactile

Object: 09

Tactile

Bark of an interesting tree.



Symbol Generated: 09

Tactile: Pertaining to touch; characterized by roughness or smoothness and having the quality of being interesting to the touch.

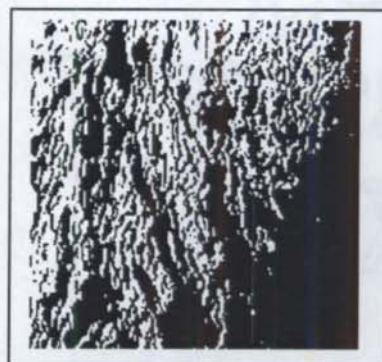


Figure 8.9.1
Symbol Tactile

Example 10: Visual Roughness

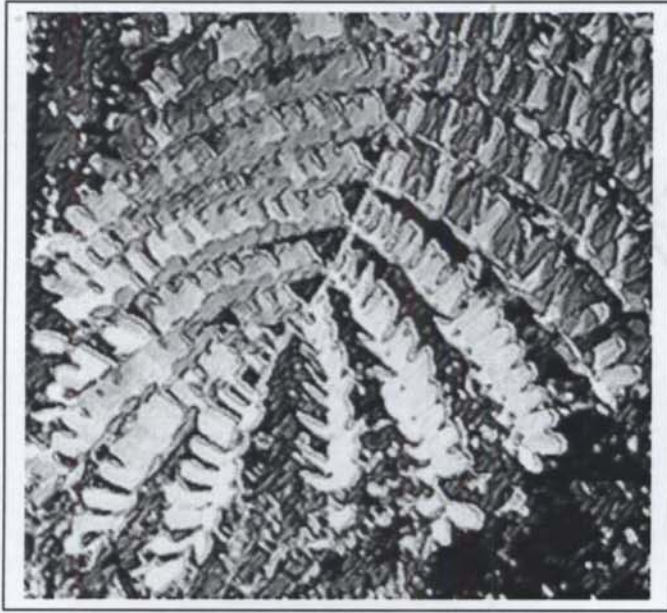
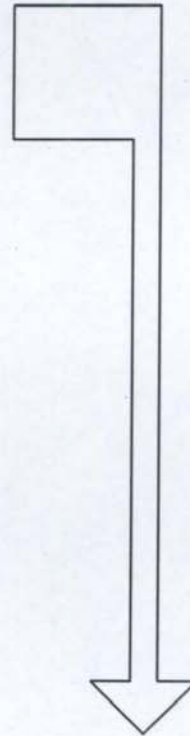


Figure 8.10 Source figure for Visual Roughness

Object: 10

Visual Roughness

A compound leaf of *Peltophorum inermi* is chosen to represent visual roughness



Symbol Generated: 10

Visual Roughness:

Imparting strong textural images characterized by roughness or smoothness which pertain to the faculty of vision



Figure 8.10.1
Symbol for Visual Roughness

8.4 VALIDATION OF SYMBOLS DEVELOPED

Extensive questionnaire surveys were conducted among students and teachers of B. Arch in various schools of architecture in India on ten symbols selected at random.(Annexure 04.C) Response of the surveyed regarding the communicational efficiency of the symbols developed were obtained through a questionnaire containing the symbols in terms of percentages varying from 50 to 100. While a rating of 100% indicates perfect signification, below 50% indicates no communication by the symbols for the words which they are intended to signify. Any rating 60% - 70% is *acceptable*; rating of 70% - 80% is *very good* and rating of 80% and above is considered *excellent* in terms of communication.

The consolidated total average results of the survey are given in Table: 8.3. Zone wise results are in good agreement with the total average.(Table 8.4,5) Suggestions for further improvement of communicational efficiency of the symbols are also gathered from the surveyed. The consolidated statement of the suggestions obtained is given in Table: 8.6 for further refinement of the symbols developed.(Annexure 01.C)

The analysis of the responses establishes a score of 72% and above for all the symbols developed which confirms a rating; '*very good*', for all the developed symbols. Moreover, four symbols out of the ten scored '*excellent*' in terms of communicational efficiency, validating the methodology and symbols developed through this research. However, suggestions for improvement of communicational efficiency are also evolved for future refinement of symbols.

Generally, lack of 'excellent image quality' in terms of simplicity of image, clear edges, normal vertical axis, and well-balanced disposition of elements of image with 'no biases' are found to be the reasons which contribute to the lowering of efficiency of communication of symbols. Choice for '*natural source*' for symbol and enhancement of 'image quality' of the symbols increase the efficiency of communication of symbols.

Table 8.3 Comprehensive statement of responses on the symbols developed - Survey 04

Sl. No.	Symbol	Total Score	Average (%)	Teachers MES		S2 B. Arch, MES		IIT-B		CET - Total		NITC - Total		Teachers ICHH 2005	
1	Balance	12717	79%	580	83%	1200	75%	1160	73%	5760	79%	2410	78%	1600	84%
2	Contrast	12717	79%	510	73%	1240	78%	1140	71%	5860	80%	2390	77%	1570	83%
3	Gradual	11707	72%	470	67%	1090	68%	1050	66%	5490	75%	2340	75%	1260	66%
4	Harmony	11877	73%	500	71%	1340	84%	990	62%	5560	76%	2260	73%	1220	64%
5	Shade	12927	80%	510	73%	1220	76%	1180	74%	6140	84%	2520	81%	1350	71%
6	Dialogue	12177	75%	490	70%	1030	64%	1210	76%	5800	79%	2360	76%	1280	67%
7	Arcade	12907	80%	460	66%	1280	80%	1330	83%	5940	81%	2500	81%	1390	73%
8	Tactile	13798	85%	570	81%	1310	82%	1350	84%	6350	87%	2650	85%	1560	82%
9	Rough Texture	13728	85%	550	79%	1430	89%	1320	83%	6320	87%	2650	85%	1450	76%
10	Visual Roughness	12657	78%	450	64%	1150	72%	1280	80%	5880	81%	2500	81%	1390	73%
Total Score		16200		700		1600		1600		7300		3100		1900	

Table 8.4 Zone wise responses on the symbols (Kerala State) – Survey 04

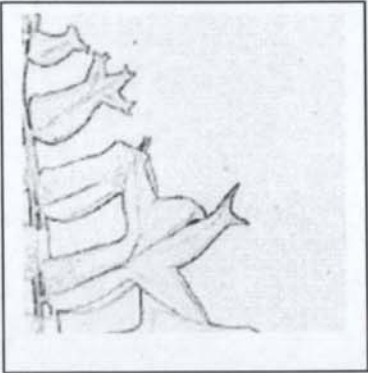
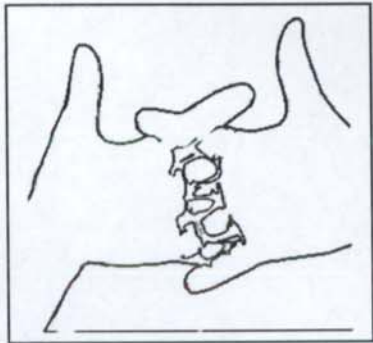
Sl. No.	Symbol	Total Score	Average (%)	Teachers MES		S2 B. Arch, MES		CET - Total	
1	Balance	7540	79%	580	83%	1200	75%	5760	79%
2	Contrast	7610	79%	510	73%	1240	78%	5860	80%
3	Gradual	7050	73%	470	67%	1090	68%	5490	75%
4	Harmony	7400	77%	500	71%	1340	84%	5560	76%
5	Shade	7870	82%	510	73%	1220	76%	6140	84%
6	Dialogue	7320	76%	490	70%	1030	64%	5800	79%
7	Arcade	7680	80%	460	66%	1280	80%	5940	81%
8	Tactile	8230	86%	570	81%	1310	82%	6350	87%
9	Rough Texture	8300	86%	550	79%	1430	89%	6320	87%
10	Visual Roughness	7480	78%	450	64%	1150	72%	5880	81%
Total Score		9600	100%	700		1600		7300	

Table 8.5 Zone wise responses on the symbols (All India) – Survey 04

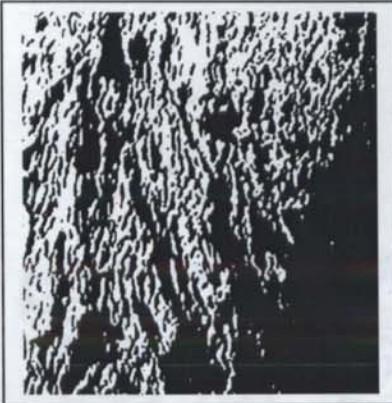
Sl. No.	Symbol	Total Score	Average (%)	IIT-B		NITC - Total		Teachers ICHH 2005	
1	Balance	5170	78%	1160	73%	2410	5170	1600	84%
2	Contrast	5100	77%	1140	71%	2390	5100	1570	83%
3	Gradual	4650	70%	1050	66%	2340	4650	1260	66%
4	Harmony	4470	68%	990	62%	2260	4470	1220	64%
5	Shade	5050	77%	1180	74%	2520	5050	1350	71%
6	Dialogue	4850	73%	1210	76%	2360	4850	1280	67%
7	Arcade	5220	79%	1330	83%	2500	5220	1390	73%
8	Tactile	5560	84%	1350	84%	2650	5560	1560	82%
9	Rough Texture	5420	82%	1320	83%	2650	5420	1450	76%
10	Visual Roughness	5170	78%	1280	80%	2500	5170	1390	73%
Total Score		6600	100%	1600		3100		1900	

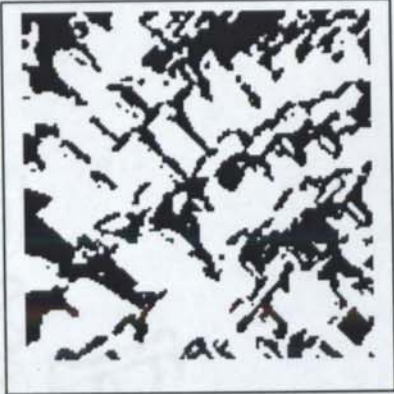
Table 8.6 Results and Discussion of responses on the symbols – Survey 04

Sl. No	Symbol	Response by the surveyed	Suggestions for improvement
01	BALANCE 	Vertical axis of the image to be made normal to the horizontal. Acceptable as the 'simplest and most reduced' form as symbol. Perfectly balanced disposition of elements of the form required	Symmetrical disposition of elements of the image about normal axis.
02	CONTRAST 	Improve quality of image Provide a full square around the form for enhanced clarity. Equalize black and white areas in the form Contrast in shape and colour add to the communicational efficiency of the symbol.	Symmetrical disposition of elements of form and layering of meaning through multiple means.

03	GRADUAL 	Improve quality of image Stop with just three basic elements rather than four for simplification of the form Since 'gradual' suggests a change an indication of the direction of change preferred. Clearer changes of size of the elements at different stages preferred	Simplify image further with three elements Image quality to be improved Signification of 'gradual' to be given preference over the directionality, even at the choice of an alternate form
04	HARMONY 	Another natural form preferred since 'hands joined' has cultural bias. Eg. A landscape with mountains and rivers. Enhance interlocking by way of thumbs places at closer proximity. Improve quality of image	Natural source enhances communicational efficiency and eliminates possible 'biases.

05	SHADE 	Once the presence of light is assumed, the form signifies shadow also. Include one more grade of shade Make the elements of form even bigger for easy perception	Include one more grade of shade to make the variation clearer.
06	DIALOGUE 	Improve quality of image. ‘Dialogue’ has a natural association with speech and human beings. Natural image improves the communicational efficiency, even in the difficult situation.	An even simpler, natural form might improve the communicational efficiency in a situation where there is a strong association with other words or actions.

07	ARCADE 	Improve quality of image. Increase the number of arches. Simple enough for effective signification	Improve the image quality with three numbers of arches clearly shown in the form.
08	TACTILE 	Strongly represents the rough tactile quality of a surface. The source; 'Bark of the Tree' is quite evident	Strong tactile signification is evoked by the fissured and highly rough bark of tree. Right matching of the dominant property of the source with the signified always imparts higher communicational efficiency.

09	ROUGH TEXTURE 	Very high communicational efficiency thanks to the spiky textural quality of the source object. Assuming the presence of light enhances the signification.	Strong signification of 'rough texture' is evoked by the spiky surface of jack fruit. Right matching of the dominant property of the source with the signified always imparts higher communicational efficiency.
10	VISUAL ROUGHNESS 	Improve quality of image Presence of unevenly distributed, sharper elements of form suggested.	Improved image quality with sharper elements of form will enhance the communicational efficiency

8.5 DEVELOPMENT OF PEDAGOGICAL TOOL FROM POSTERS

A sustained presence of signification of the subject of talk throughout the lecture in the foreground of attention is likely to enhance the possibility of students *grasping the essential point* and *understanding of the subject*, as evidenced in the Survey 01 conducted among the students of B. Arch programme in architectural schools of India.[3, 92] Posters as graphical tools would effectively perform this task of sustained significance facilitating learner empowerment. Further, poster as a single sheet, unfolded and printed only on one side is the simplest medium for graphic communication that has very high impact. It exemplifies its essential elements; *alphabet and image*, and works well together as a means of graphic reproduction in deciphering meaning. Poster has very high communicational efficiency especially when it acquires the characteristics of an *object poster* combining high impact image and relevant text as in the case of war posters. Over and above its basic functions, posters when used as pedagogical tools require a way of classification and coding for its efficient production, storage, retrieval and use.

Class room dimensions normally generate intimate viewing distances of 60mm to 120mm especially from the considerations of viewing efficiency. Therefore, standard A3 size of paper measuring 420mm x 297mm is found appropriate and economical for the making of posters used for classroom communication. Relatively larger area; 2.5 times that of the area occupied by the symbol, is apportioned for the background, in order to generate deeper impact and increased communicational efficiency resulting from layering of meaning. The area apportioned for the background is given a treatment of an identified colour that effectively symbolizes the

context, thereby facilitating guided communication. This is achieved primarily by way of appropriate colours that effects good fit with the theme of the poster, its intended function including aesthetic function.

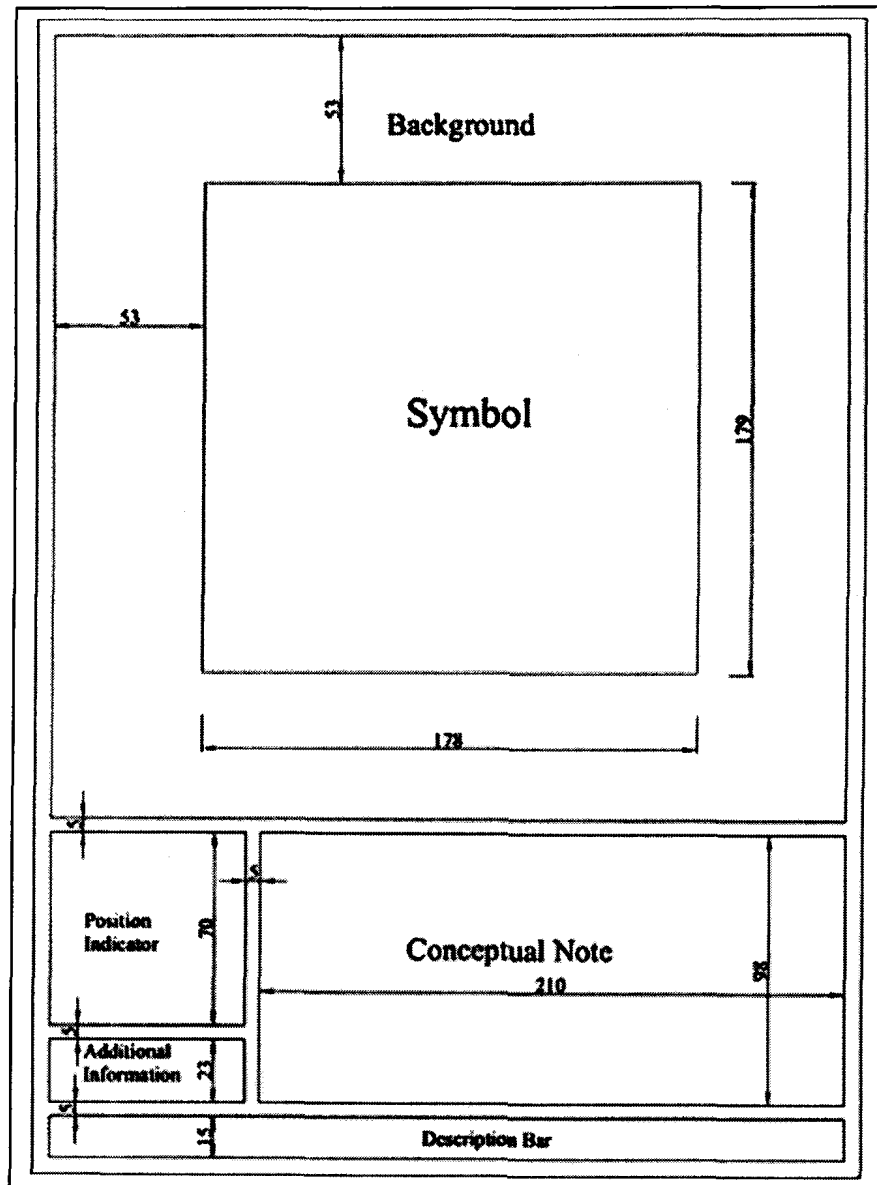


Fig 8.11 *Layout of standardized Poster*

The *position indicator* comprises of a square symbolizing the 'design space' which is relevant in the discussion. The position of indicator generated from a part of

the symbol, when positioned in relation to the square frame, locates the place where the application of the item discussed occurs like right wall, left wall, floor and ceiling. The rectangular indicator with identical appearance of the symbol facilitates easy signification of the element; the signified, thereby imparts coherence. Increased visual interest is achieved in the poster through selective repetition of the symbol in a lighter shade appearing in an appropriate position, by imparting visual dynamism.

Additional information indicator is a rectangular space that is treated with an appropriate color to generate interest in the area of discussion. Declaration of the source of the symbol in order to impart quicker understanding of the characteristics of the word signified is incorporated here.

The *description bar* serves the dual purposes of generating *unity in the poster* and also to contain the *coding of the poster, its symbol and other relevant, descriptions*. Once classified and effectively integrated; any communicator could use these in a customized way, in order to generate wider scope for its application. Production of posters made more or less 'designer-independent' by systematic standardization that facilitates layering of meaning and guided revelation of the intended meaning in its viewers. Further, it could be made user interactive by linking it to a data bank of symbols and the respective position indicators so that teachers could generate their own customized posters for classroom use. Twenty standardized posters are generated using the symbols developed through this research. Out of these, ten posters which use validated symbols are included in the body of the report.(Figure 8.12-21) The rest Ten posters are given in Annexure 03.

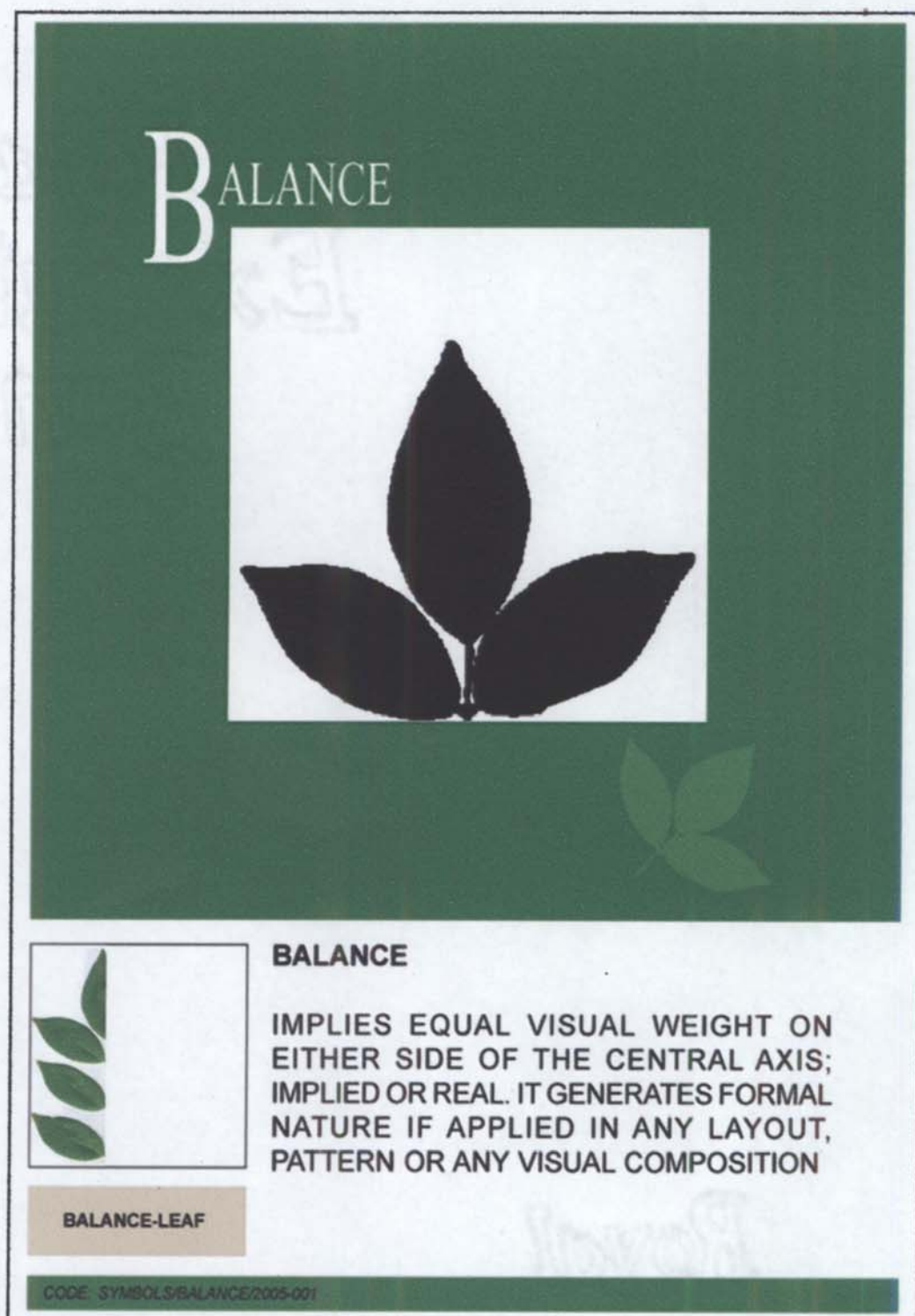


Fig 8.12 Poster 01: Balance

Posters 02: CONTRAST



Fig 8.13 Poster 02: Contrast

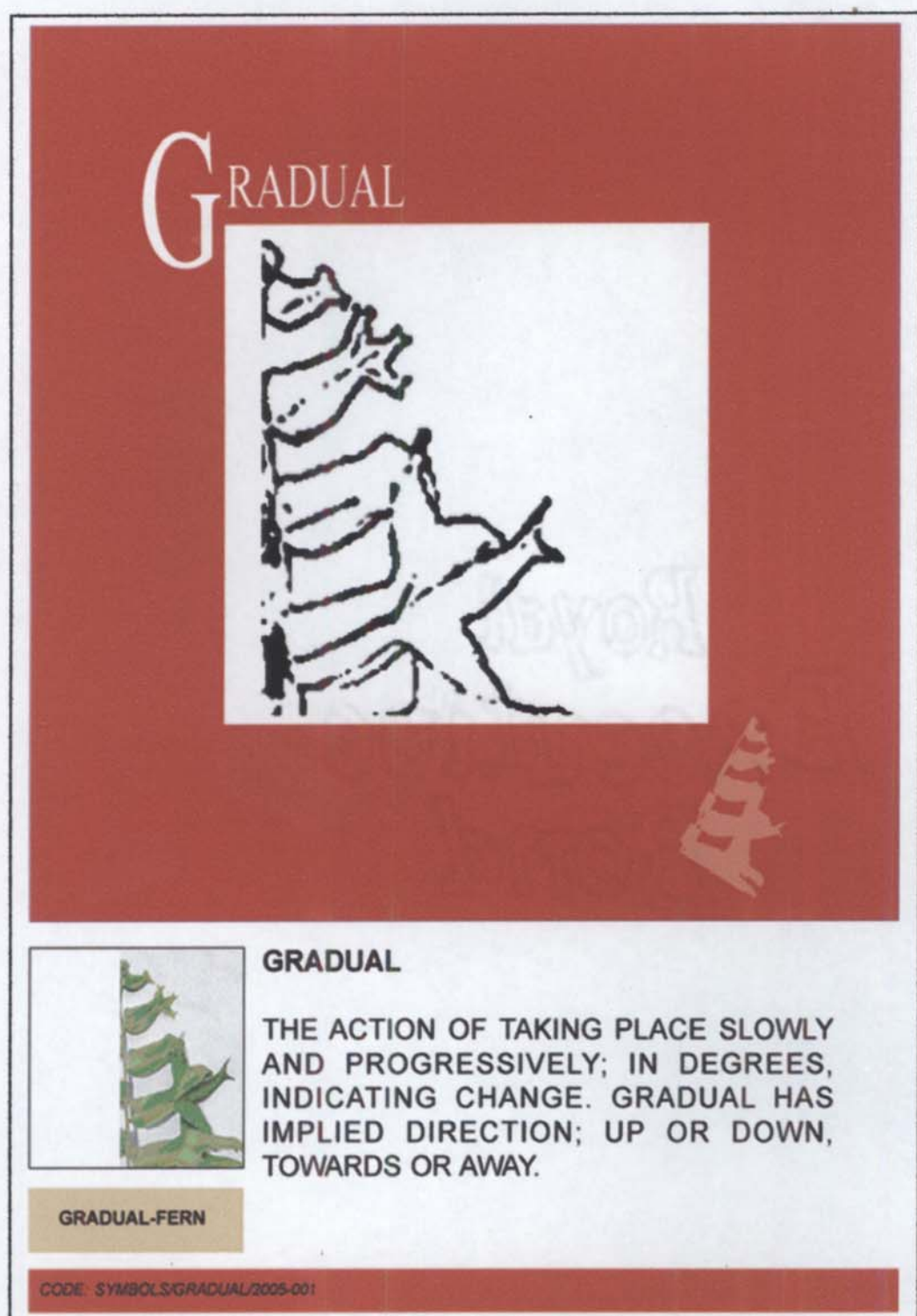


Fig 8.14 Poster 03: Gradual

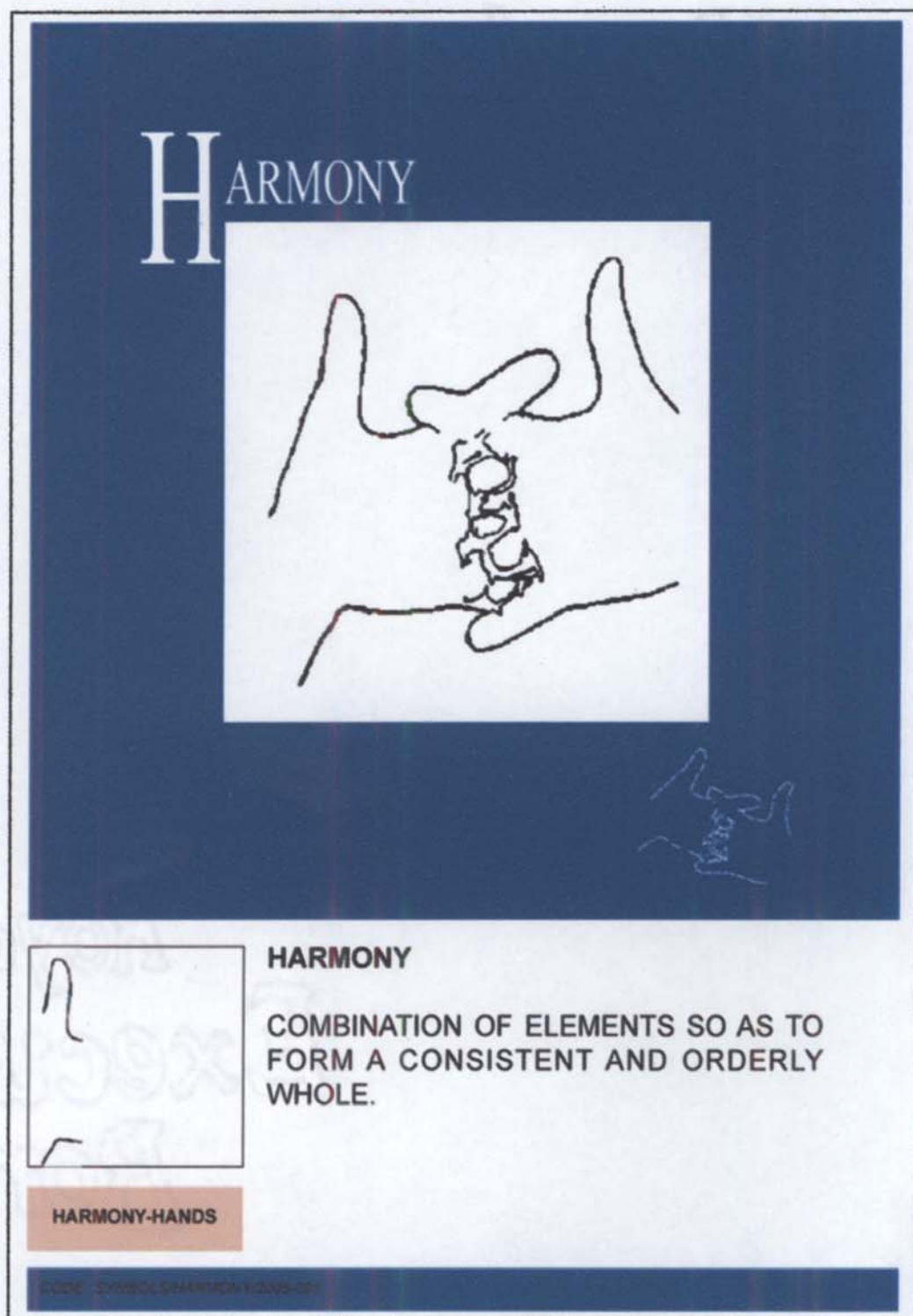


Fig 8.15 Poster 04: Harmony

Posters 05: SHADE

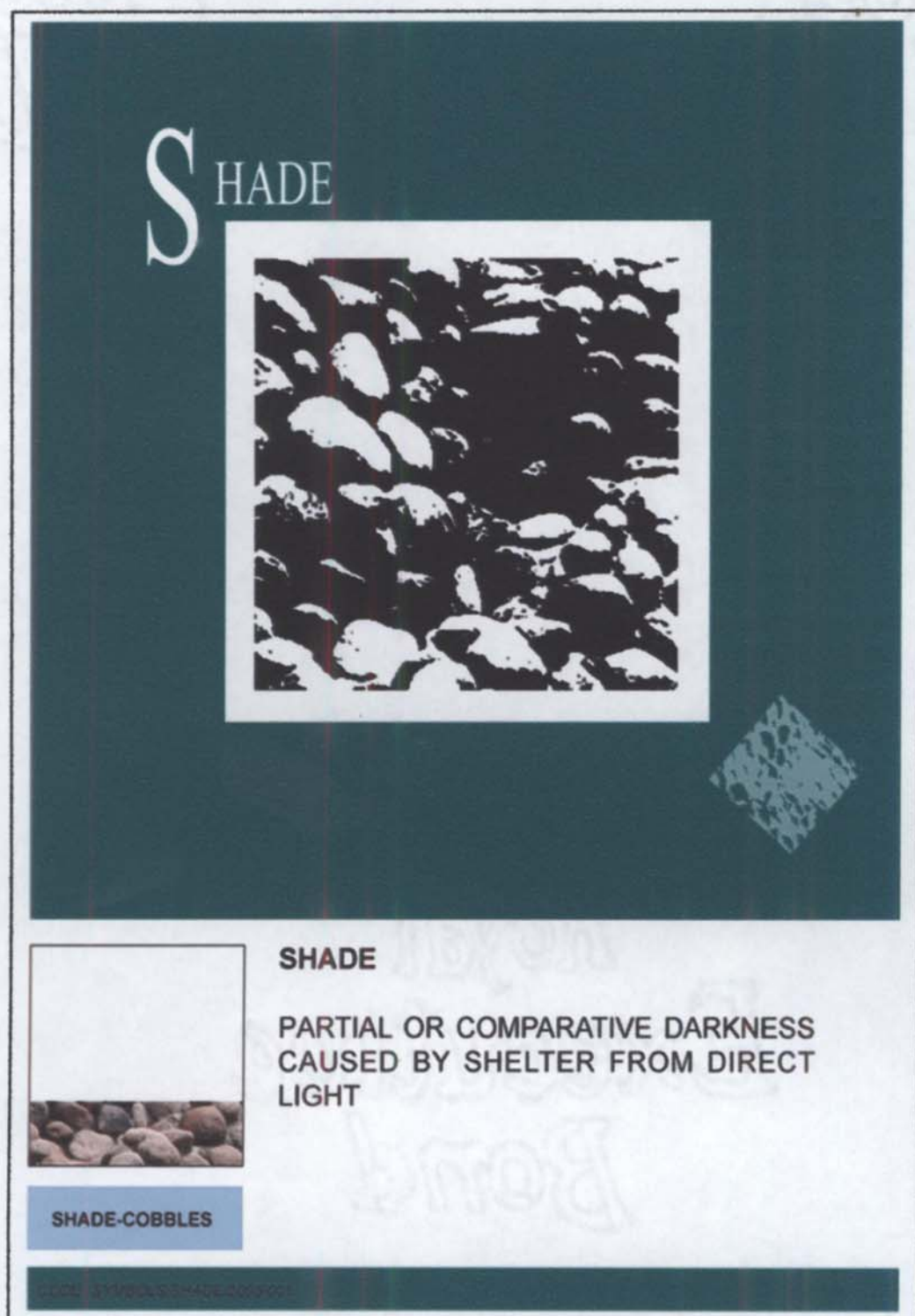


Fig 8.16 Poster 05: Shade

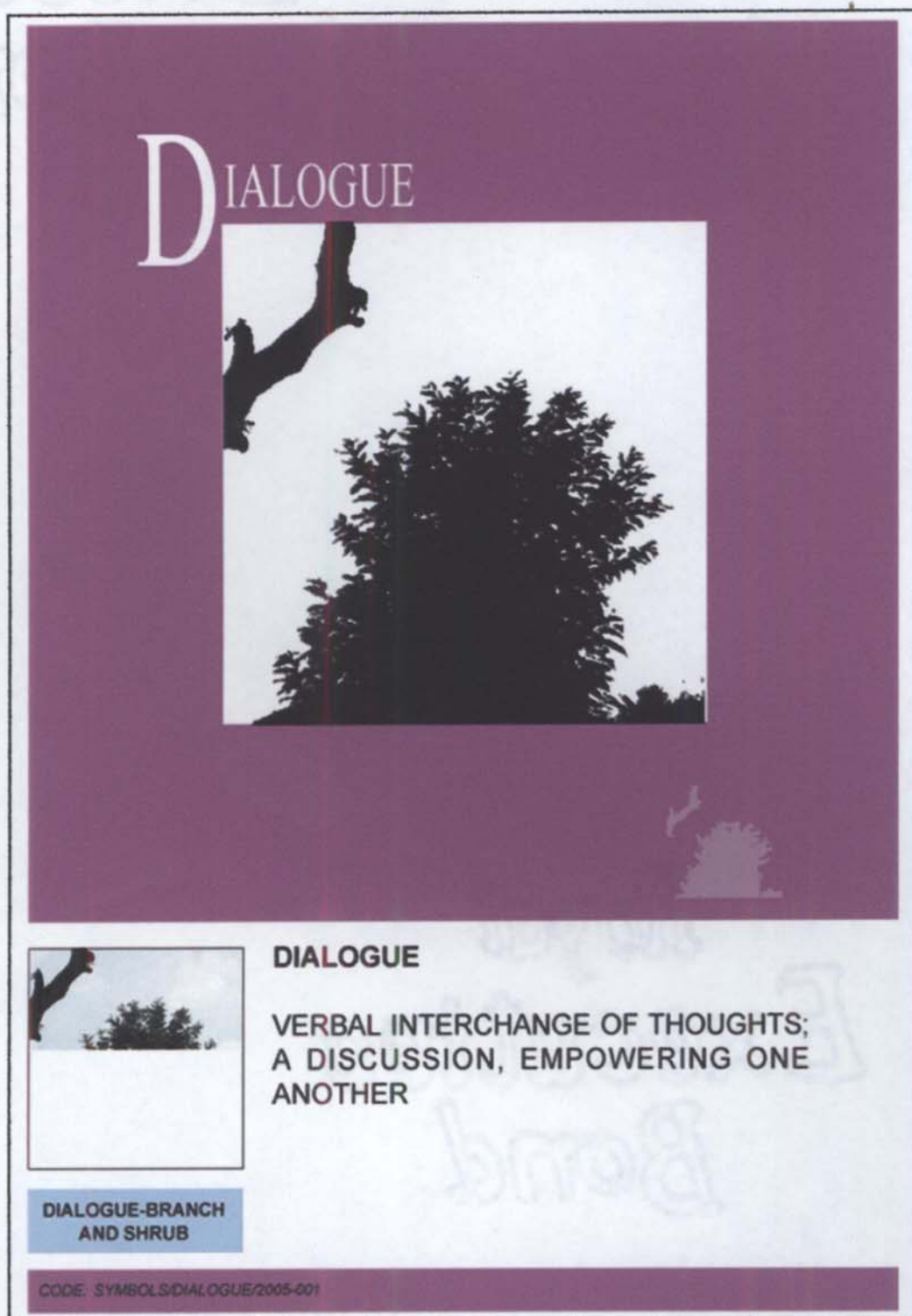


Fig 8.17 Poster 06: Dialogue

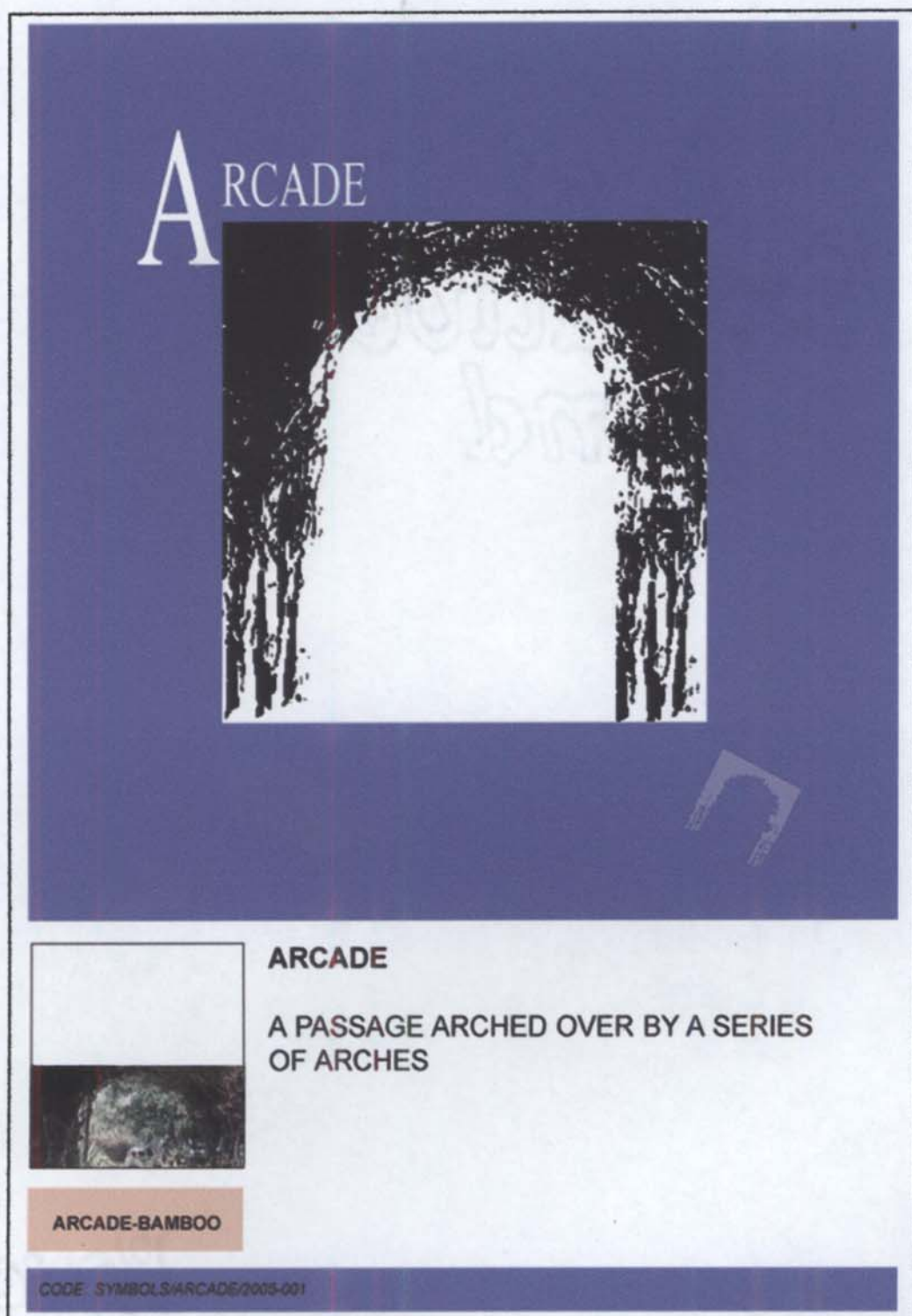


Fig 8.18 Poster 07: Arcade

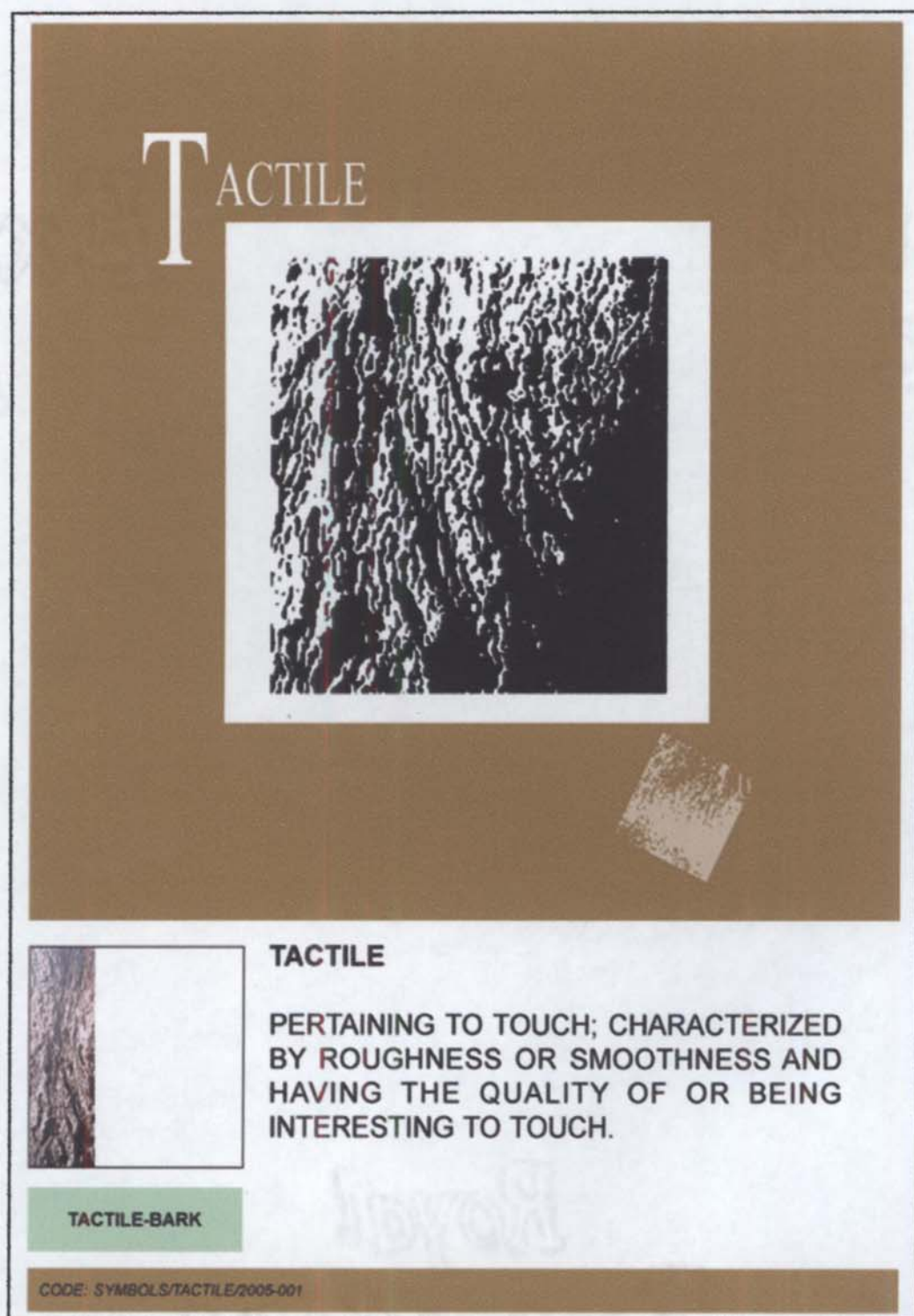


Fig 8.19 Poster 08: Tactile

Posters 09: ROUGH TEXTURE

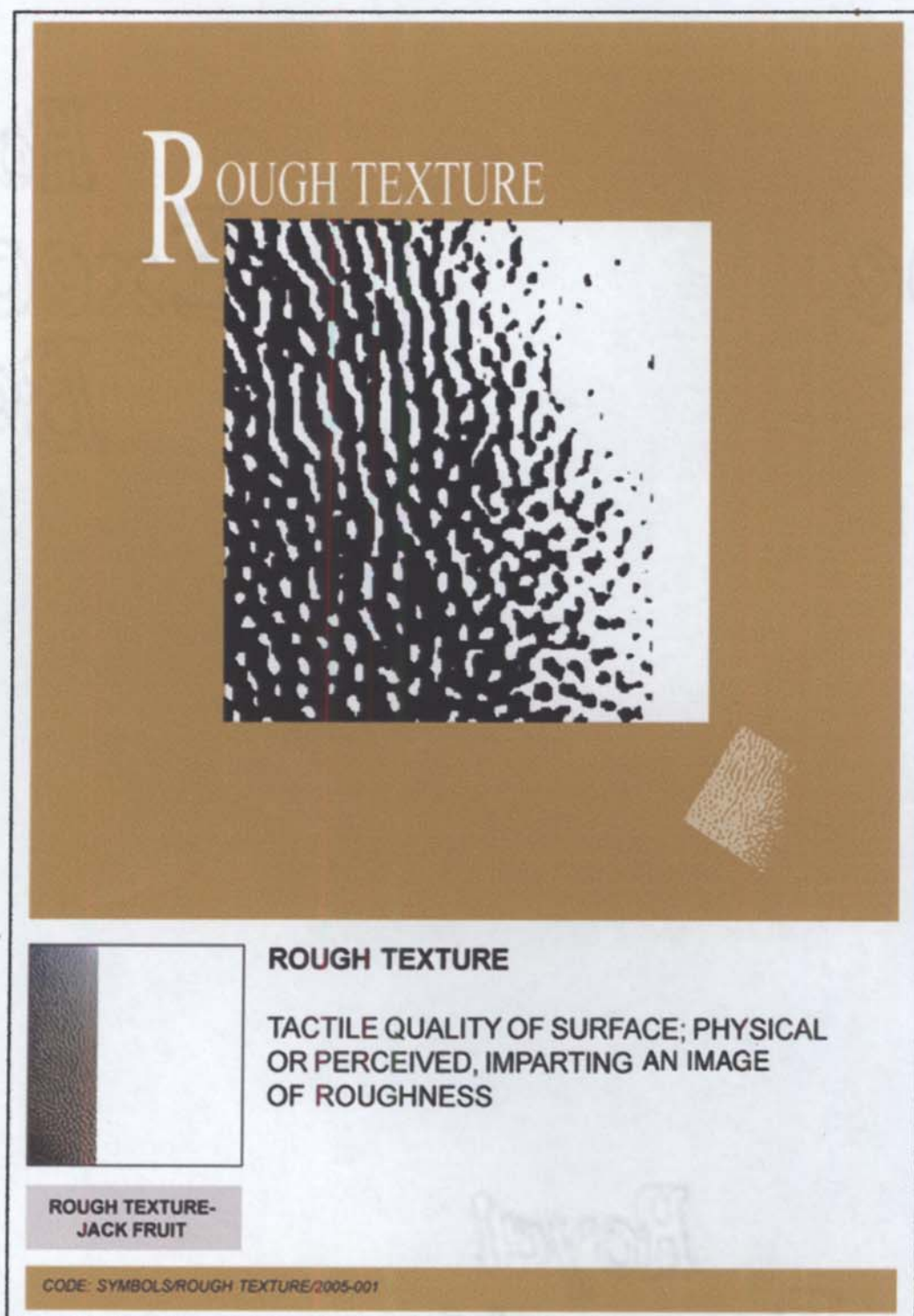


Fig 8.20 Poster 09: Rough Texture

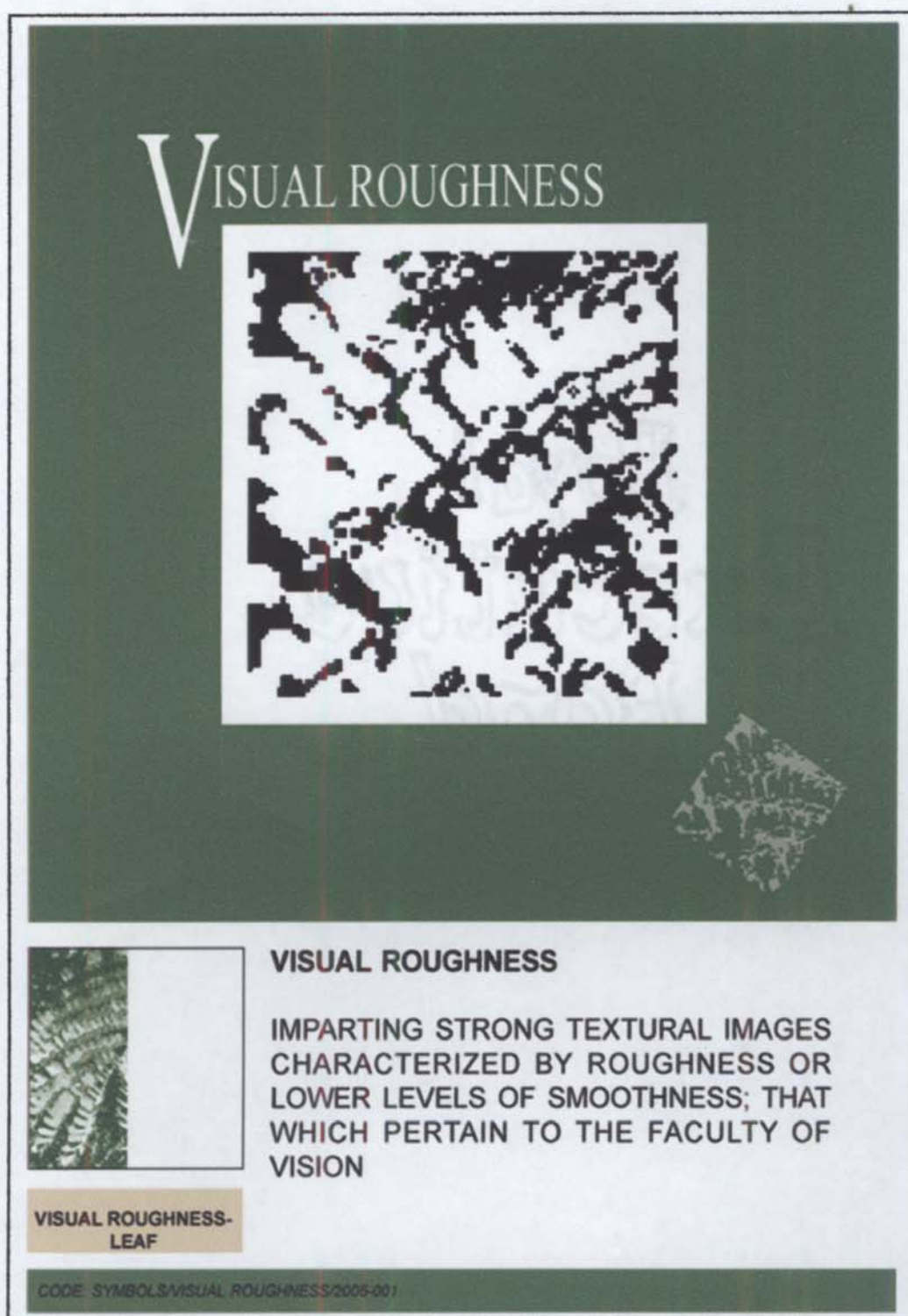


Fig 8.21 Poster 10: Visual Roughness

9.0 ORIGINALITY OF THE RESEARCH

Nature with its myriad of manifestations is never identified earlier as a dependable source for objects used in the development of symbols. Images used earlier, in symbols were geometric or abstract and they had to change with times since they depended on the culture of its times for meaning. On the contrary, images chosen directly from nature are proposed in this research. Even where photographs were used in the production of symbols the final image is the interpretation of the designer, not directly obtained from the source object, whereas, nature is relatively free of ‘cultural biases’. Therefore, digital photographic images from nature proposed to serve as source objects in the making images relatively ‘free of designer input’. There exists no methodology to generate neither standard symbols nor guidelines to enhance their efficiency of communication. A methodology for generation of standard symbols with high impact is proposed through this research. Though poster has proved to be extremely successful in communication, it was never used as a tool of communication in teaching. Moreover, a standardized format facilitating customization by any communicator is never attempted. Object poster with standardized format for easy customization is proposed in this research.

9.1 APPLICATION

The symbols developed through the research are of excellent value of communication over wider sections of people amounting to heterogeneity. These symbols could therefore be of positive use in all communications especially in architectural communications. They could be applied in a range of communicative situations, right from simple images to images combined with lecture notes in handouts to symbols and other elements of design bringing out meaning through effective layering; in the form of posters or other products of Graphic design. The enhanced choice could be provided in such posters in regard to symbols for effecting communication in other areas of higher education. Since the symbols are having excellent value of communication, these could be effectively put to use in Internet education. Moreover, appropriate posters could make sustained signification of the lectures for students who subscribe to Internet learning from far-off places. Further, these symbols could create a novel type of icons in interface designs that holds the key for Internet communication in future years.

9.2 FURTHER SCOPE

Freedom of choice of high value symbols would be of definite advantage in the making of posters or any other Graphic design products which use symbols. Though, Twenty one symbols are developed through the research, there remains a bigger task of developing a '*Data Bank of Symbols*' consisting of numerous validated symbols which could be used in a variety of communicational situations. These symbols could be classified and stored in appropriate digital format for effective retrieval and modification. Further, design of posters could be made user-interactive

which facilitates customization by communicators. It is hoped that future researches in the direction would enable communicators in effecting learner empowerment.

9.3 CONCLUSION

Communication; people to people and nation to nation, is kernel to understanding. It would be presumptuous to imply that standardized graphic symbols will result in perfect intercommunication, yet it is very important for man to communicate to one another without barriers of geographical location, language, culture or the like. Once people could communicate meaningfully, it would further the higher goals of communication.

There exists enormous potential in Architecture to communicate what we want to communicate symbolically, without any barriers for empowering the students. Training in architecture through educational processes shall facilitate observation, reflective thinking and reinterpretation in terms of graphics in the pursuit of generation of meaningful architecture. Once the design is made symbolic, it enlivens the form with meaning that would further higher goals of spatial communication.

A methodology is developed for generating symbols through this research. It is simple enough to generate symbols with high efficiency of communication. Nature with its myriad manifestations is identified to be a dependable source of relatively 'bias-free' symbols. The development of symbols is made more or less designer-independent with the use of digital imaging and appropriate image editing software.

A set of twenty-one symbols are also generated to represent randomly selected words from the identified '*List of Words*' generated through an exhaustive survey. The generated symbols are validated through an extensive survey conducted among students of architecture. These symbols are judged to be equivalent to the words which they signify with an over all minimum score of 72%. Further, a designer-independent, standardized poster as a graphic tool for communication is developed. Twenty such posters are developed for classroom communication.

The symbolic pedagogical tools would enable any worthy communicator in general and the teacher of architecture in particular, to decipher messages in a platform-independent manner. Moreover, the use of the developed symbols and posters would facilitate better student-teacher interaction and communication that would empower students and teachers in higher education to decipher messages in a platform-independent manner, especially in architecture. In conclusion, the developed symbols and symbolic tools through this research would further the goals of teaching, learner empowerment and facilitate Net-enabled education in the days to come.

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**A INDIVIDUAL RESULTS - VALIDATION OF RESPONSES
ON THE SYMBOLS DEVELOPED: SURVEY 01**

Table 1.2 Statement of Responses (College of Engineering, Trivandrum) - Survey 01

Qn. No	Question	CET - F4		CET - F3		CET - S4		CET - S1S2	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	9	50.0%	4	40.0%	16	55.2%	13	40.6%
3 a	Means of verification of lectures? - Consult teacher	2	11.1%	0	0.0%	6	20.7%	6	18.8%
3 b	Consult peers	0	0.0%	0	0.0%	2	6.9%	1	3.1%
3 c	Other means	16	88.9%	10	100.0%	21	72.4%	25	78.1%
4 and 6	Does illustration, Symbol assisted lectures helps?	18	100.0%	10	100.0%	28	96.6%	32	100.0%
5	Problem in understanding Math / Engg lectures?	7	38.9%	3	30.0%	11	37.9%	7	21.9%
7 a	Nature of terms used in architecture - Subjective?	15	83.3%	10	100.0%	21	72.4%	25	78.1%
7 b	Nature of terms used in architecture - Relational?	14	77.8%	7	70.0%	27	93.1%	27	84.4%
8	Do Symbols and posters with symbols would improve classroom communication?	17	94.4%	10	100.0%	29	100.0%	31	96.9%
	No. of respondents	18		10		29		32	

Table 1.3 Statement of Responses (*College of Engineering, Trichur*) - Survey 01

Qn. No	Question	COE - F4 TRICHUR		COE - F5 TRICHUR	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	11	57.9%	8	53.3%
3 a	Means of verification of lectures? - Consult teacher	6	31.6%	2	13.3%
3 b	Consult peers	1	5.3%	1	6.7%
3c	Other means	12	63.2%	12	80.0%
4 and 6	Does illustration, Symbol assisted lectures helps?	19	100.0%	14	93.3%
5	Problem in understanding Math / Engg lectures?	6	31.6%	6	40.0%
7	Nature of terms used in architecture - Subjective?	9	47.4%	10	66.7%
7b	Nature of terms used in architecture - Relational?	13	68.4%	9	60.0%
8	Do Symbols and posters with symbols would improve classroom communication?	14	73.7%	13	86.7%
	No. of respondents	19		15	

Table 1.5 Statement of Responses (NIT Calicut) - Survey 01

Qn. No	Question	NITC - S10		NITC - S6		NITC - FIRST THESES	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	9	50.0%	7	50.0%	6	75.0%
3 a	Means of verification of lectures? - Consult teacher	5	27.8%	2	14.3%	4	50.0%
3 b	Consult peers	1	5.6%	1	7.1%	4	50.0%
3 c	Other means	12	66.7%	11	78.6%	3	37.5%
4 and 6	Does illustration, Symbol assisted lectures helps?	16	88.9%	12	85.7%	8	100.0%
5	Problem in understanding Math / Engg lectures?	5	33.3%	6	42.9%	3	37.5%
7	Nature of terms used in architecture - Subjective?	15	83.3%	8	57.1%	8	100.0%
7b	Nature of terms used in architecture - Relational?	16	88.9%	14	100.0%	6	75.0%
8	Do Symbols and posters with symbols would improve classroom communication?	18	100.0%	13	92.9%	8	100.0%
	No. of respondents	18		14		8	

Table 1.3 Statement of Responses (MES College of Engineering) - Survey 01

Qn. No	Question	MES - S1S2, Kuttippuram	
		Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	11	45.8%
3 a	Means of verification of lectures? - Consult teacher	9	37.5%
3 b	Consult peers	0	0.0%
3c	Other means	15	62.5%
4 and 6	Does illustration, Symbol assisted lectures helps?	24	100.0%
5	Problem in understanding Math / Engg lectures?	8	33.3%
7	Nature of terms used in architecture - Subjective?	20	83.3%
7b	Nature of terms used in architecture - Relational?	22	91.7%
8	Do Symbols and posters with symbols would improve classroom communication?	20	83.3%
	No. of respondents	24	

Table 1.5 Statement of Responses (RIZVI-Bombay) - Survey 01

Qn. No	Question	RIZVI - S3, Bombay	
		Yes	Problem of communication Exists
1 and 2	Problem in understanding Classroom lectures?	5	38.5%
3 a	Means of verification of lectures? - Consult teacher	2	15.4%
3 b	Consult peers	1	7.7%
3 c	Other means	10	76.9%
4 and 6	Does illustration, Symbol assisted lectures helps?	13	100.0%
5	Problem in understanding Math / Engg lectures?	3	23.1%
7	Nature of terms used in architecture - Subjective?	12	92.3%
7b	Nature of terms used in architecture - Relational?	13	100.0%
8	Do Symbols and posters with symbols would improve classroom communication?	13	100.0%
	No. of respondents	13	

**B INDIVIDUAL RESULTS - VALIDATION OF RESPONSES
ON THE SYMBOLS DEVELOPED: SURVEY 02**

Table1.7 Statement of Responses (College of Engineering, Trivandrum) - Survey 02

Qn. No	Question	CET - F4		CET - F3		CET - S4		CET - S1S2	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	7	38.9%	3	30.0%	12	41.4%	10	31.3%
	No. of respondents	18		10		29		32	

Table1.8 Statement of Responses (College of Engineering, Trichur) – Survey 02

Qn. No	Question	COE - F4 TRICHUR		COE - F5 TRICHUR	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	9	47.4%	5	33.3%
	No. of respondents	19		15	

Table 1.10 Statement of Responses (NIT Calicut) – Survey 02

Qn. No	Question	NITC - S10		NITC - S6		NITC - S4 B. Arch	
		Yes	Problem of communication Exists	Yes	Problem of communication Exists	Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	7	38.9%	4	28.6%	2	11%
	No. of respondents	18		14		19	

Table1.8 Statement of Responses (MES - Kuttippuram) – Survey 02

Qn. No	Question	MES - S1S2	
		Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	8	33.3%
	No. of respondents	24	

Table 1.10 Statement of Responses (*RIZVI, Bombay*) – Survey 02

Qn. No	Question	RIZVI - S3	
		Yes	Problem of communication Exists
1 and 2	Problem in understanding design discussions	3	23.1%
	No. of respondents	13	

**C. INDIVIDUAL RESULTS - VALIDATION OF RESPONSES
ON THE SYMBOLS DEVELOPED: SURVEY 04**

Response of Students on symbols developed:

Visual Design, IIT-Bombay

		Number of responses for indicate percentage:							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	1600	
1	Balance	2	5	1	1	3	2	2	1160	72.5%
2	Contrast		4	5	1	2	3	1	1140	71.3%
3	Gradual		3	2	3	3	3	2	1050	65.6%
4	Harmony	1	3	1		2	6	3	990	61.9%
5	Shade	3	4	1	1	3	3	1	1180	73.8%
6	Dialogue	2	5	3	2		2	2	1210	75.6%
7	Arcade	6	3	2	1	3	1		1330	83.1%
8	Tactile	6	4	1	1	4			1350	84.4%
9	Rough Texture	4	6	2	1		3		1320	82.5%
10	Visual Roughness	2	5	5		3	1		1280	80.0%

No. of Respondents: 16

Response of Teachers on symbols developed:

Teacher-Architects, MES School of Architecture, Kuttipuram

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	700	
1	Balance	1	3	1	1	1			580	82.9%
2	Contrast	1	1		3	1	1		510	72.9%
3	Gradual		1	1	2	1	2		470	67.1%
4	Harmony	1	1	1	1	1	2		500	71.4%
5	Shade		2	3			1	1	510	72.9%
6	Dialogue		2	2			3		490	70.0%
7	Arcade		1	1	1	2	2		460	65.7%
8	Tactile	1	2	2	1	1			570	81.4%
9	Rough Texture	1	2	2		1	1		550	78.6%
10	Visual Roughness			1	2	3	1		450	64.3%

No. of Respondents: 7

Response of S2 B. Arch Students on symbols developed:

MES School of Architecture, Kuttipuram

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	1600	
1	Balance	1	2	7	1	4	1		1200	75.0%
2	Contrast	2	4	2	6	1		1	1240	77.5%
3	Gradual		2	4	2	5	3		1090	68.1%
4	Harmony	4	2	4	4	1	2		1340	83.8%
5	Shade		5	3	6	1	1		1220	76.3%
6	Dialogue		2	2	4	2	5	1	1030	64.4%
7	Arcade	1	7	3	2	2	1		1280	80.0%
8	Tactile	5	4	4	1	1			1310	81.9%
9	Rough Texture	2	6	8			1		1430	89.4%
10	Visual Roughness	1	3	3	4	1	4		1150	71.9%

No. of Respondents: 16

Response of Students of F3 – B. Arch on symbols developed:

College of Engineering, Trivandrum

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	900	
1	Balance	2	3	3		1			770	85.6%
2	Contrast	3	3	2	1				800	88.9%
3	Gradual	2	3	2	1	1			760	84.4%
4	Harmony	2	3	3		1			770	85.6%
5	Shade		4	4		1			740	82.2%
6	Dialogue	1	5		1	2			740	82.2%
7	Arcade	6	1	1	1				840	93.3%
8	Tactile	5		2		2			780	86.7%
9	Rough Texture	2	6			1			800	88.9%
10	Visual Roughness	1	4	3		1			760	84.4%

No. of Respondents: 9

Response of Students of F4 B. Arch on symbols developed:
College of Engineering, Trivandrum

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	1800	
1	Balance	3	7	3	2	1	2		1470	81.7%
2	Contrast	4	6	4	3		1		1520	84.4%
3	Gradual	1	11	1	1	1	3		1450	80.6%
4	Harmony	1	7	4	2	2	2		1410	78.3%
5	Shade	3	8	2	4	1			1520	84.4%
6	Dialogue	1	6	6	2	2	1		1430	79.4%
7	Arcade	2	7	4	2	2	1		1460	81.1%
8	Tactile	6	6	2	1	2	1		1540	85.6%
9	Rough Texture	5	7	4	1		1		1570	87.2%
10	Visual Roughness		8	2	4	4			1400	77.8%

No. of Respondents: 18

Response of Students of S4 B. Arch on symbols developed:
College of Engineering, Trivandrum

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	2900	
1	Balance	4	6	7	6	3	3		2250	77.6%
2	Contrast	1	9	7	4	3	4	1	2170	74.8%
3	Gradual	2	4	4	8	6	4	1	2040	70.3%
4	Harmony	1	8	5	5	5	4	1	2110	72.8%
5	Shade	2	12	9	3	1	3		2420	83.4%
6	Dialogue	1	8	11	5	3	0		2230	76.9%
7	Arcade	5	6	3	13	1	1		2300	79.3%
8	Tactile	8	12	3	2	1	2	1	2460	84.8%
9	Rough Texture	7	9	7	4	2			2470	85.2%
10	Visual Roughness	1	12	10		4	2		2320	80.0%

No. of Respondents: 29

Response of Students of S1-S2 on symbols developed:

College of Engineering, Trivandrum

Sl. No.	Symbol	Number of responses for							Total Score	Average Score
		100	90	80	70	60	50	40		
1	Balance		5	4	4	3		1	1270	74.7%
2	Contrast		7	6	2	2			1370	80.6%
3	Gradual		5	3	4	2	3		1240	72.9%
4	Harmony	2	2	6		6	1		1270	74.7%
5	Shade	5	5	3	3	1			1460	85.9%
6	Dialogue		8	7	1		1		1400	82.4%
7	Arcade	3	6		2	6			1340	78.8%
8	Tactile	7	9			1			1570	92.4%
9	Rough Texture	6	4	3	4				1480	87.1%
10	Visual Roughness	1	6	8	1		1		1400	82.4%

No. of Respondents: 17

Response of Students of S6 on symbols developed:

National Institute of Technology- Calicut

Sl. No.	Symbol	Number of responses for							Total Score	Average Score
		100	90	80	70	60	50	40		
1	Balance	1	2	6	1	2	2		1050	75.0%
2	Contrast	4	3	2	3	2			1160	82.9%
3	Gradual		5	4	3	2			1100	78.6%
4	Harmony	2	3	4	4		1		1120	80.0%
5	Shade	3	3	5	1	1	1		1150	82.1%
6	Dialogue	1	3	4	5	1			1100	78.6%
7	Arcade	2	6	3	3				1190	85.0%
8	Tactile	6	4	1	3				1250	89.3%
9	Rough Texture	3	8	2		1			1240	88.6%
10	Visual Roughness	2	7	3	1	1			1200	85.7%

No. of Respondents: 14

Response of Students of *S10 B. Arch* on symbols developed:

National Institute of Technology- Calicut

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	1700	
1	Balance		8	5	2		2		1360	80.0%
2	Contrast	2	4	3	1	2	4	1	1230	72.4%
3	Gradual	1	2	5	4	3	2		1240	72.9%
4	Harmony	1	3	2	2	3	5	1	1140	67.1%
5	Shade	3	5	5		2	2		1370	80.6%
6	Dialogue	1	4	6		2	4		1260	74.1%
7	Arcade	3	3	3	4	2	2		1310	77.1%
8	Tactile	2	8	3	1	2	1		1400	82.4%
9	Rough Texture	2	4	9	1	1			1410	82.9%
10	Visual Roughness		8	3	1	2	3		1300	76.5%

No. of Respondents: 17

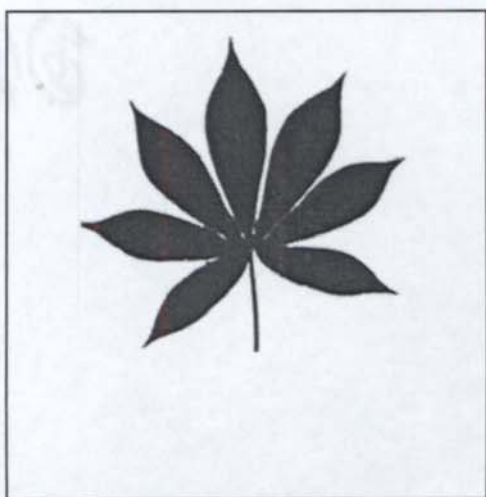
Response of delegates; *Teacher-Architects* on symbols developed:

ICHH 2005 – Rizvi College of Architecture, Mumbai

		Number of responses for							Total Score	Average Score
Sl. No.	Symbol	100	90	80	70	60	50	40	1900	
1	Balance	4	6	5	3		1		1600	84.2%
2	Contrast	4	4	4	4	2	1	1	1570	82.6%
3	Gradual	3		2	4	4	4	2	1260	66.3%
4	Harmony	2	2	3		3	6	3	1220	64.2%
5	Shade	3	4	1	5	2	2	1	1350	71.1%
6	Dialogue	2	1	2	2	6	5	2	1280	67.4%
7	Arcade	2	4	3	2	5	3		1390	73.2%
8	Tactile	4	4	4	6	1			1560	82.1%
9	Rough Texture	5	2	2	6		3	1	1450	76.3%
10	Visual Roughness	3	3	2	4	4	2	1	1390	73.2%

No. of Respondents: 19

MORE SYMBOLS



Radial



Picturesque



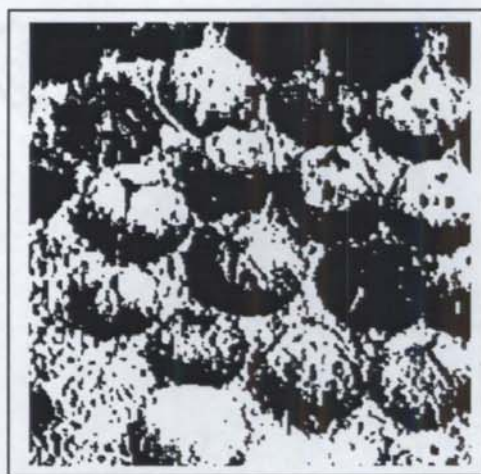
Contour



Tangible



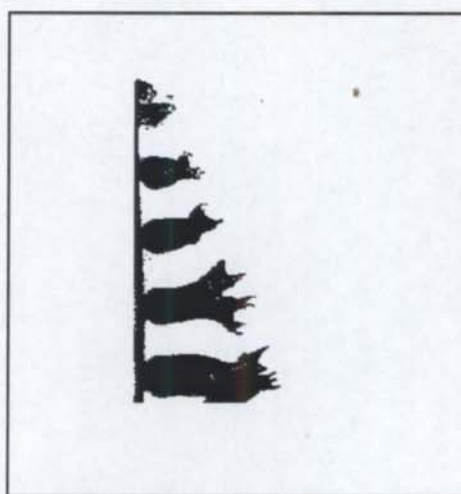
Transition



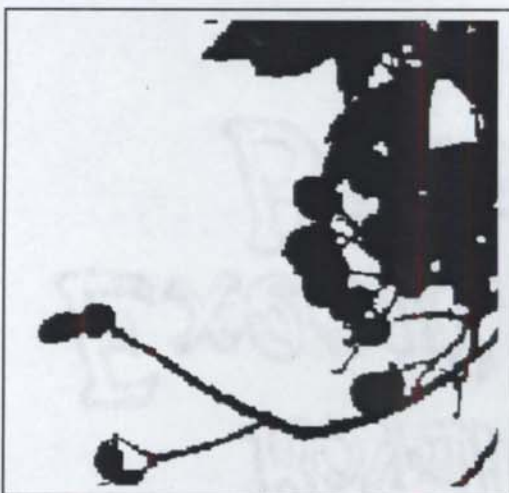
Rough Texture



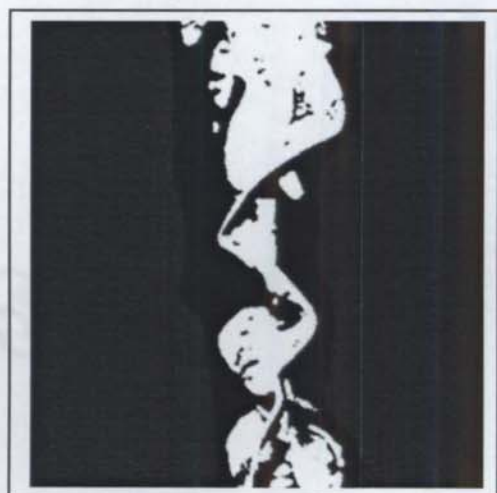
Analogous



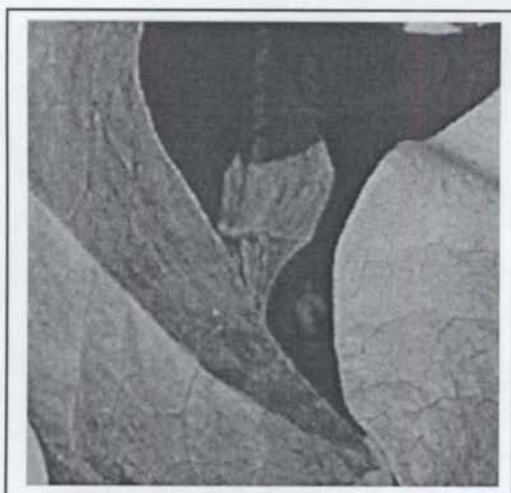
Transition



Aesthetic



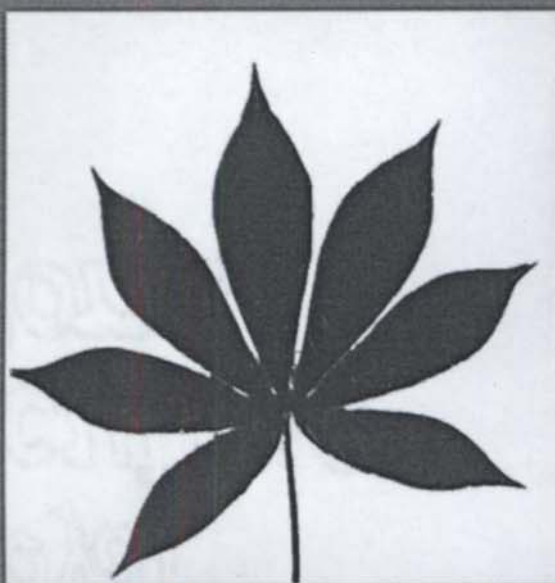
Resilient



Hue

MORE POSTERS

RADIAL



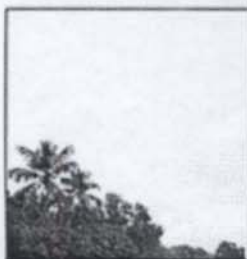
RADIAL-LEAF

RADIAL

ARRANGED LIKE RAYS OR THE RADII OF A CIRCLE; HAVING THE POSITION OR DIRECTION OF A RADIUS; DIVERGING FROM A COMMON CENTRE, WHERE THE CENTRE PLAYS A DECISIVE ROLE IN THE LAYOUT.

CODE: SYMBOLS/RADIAL/2005-001

P ICTURESQUE



PICTURESQUE-VIEW

PICTURESQUE

VIEWS POSSESSING THE ELEMENTS OR QUALITIES OF A FINE PICTURE; FIT TO BE THE SUBJECT WITH PLEASING OR STRIKING COMPOSITION, WHICH SERVE AS WONDERFUL SETTINGS FOR BUILT FORMS.

CODE: SYMBOLS/PICTURESQUE/2005-001

C ONTOUR



CONTOUR-LEAF

CONTOUR

A LINE, PASSING THROUGH POINTS OF EQUAL ELEVATION OR DEPTH ON A MAP, AS ONE OF A SERIES DRAWN AT REGULAR HEIGHT INTERVALS; A SIMILAR BUT IMAGINARY LINE ON THE GROUND, REVEALING LEVELS, PITCH, STRESS OR TONE

CODE: SYMBOLS/CONTOUR/2005-001

TANGIBLE



TANGIBLE

WHICH ARE ABLE TO BE TOUCHED;
DISCERNIBLE OR PERCEPTIBLE BY TOUCH;
HAVING MATERIAL FORM, JUST AS THOSE
WHICH CAN BE GRASPED BY THE MIND OR
DEALT WITH AS FACT; DEFINITE AND
OBJECTIVE

TANGIBLE-TULSI

CODE: SYMBOLS/TANGIBLE/2005-001

T TRANSITION



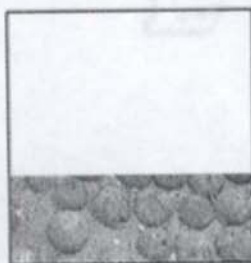
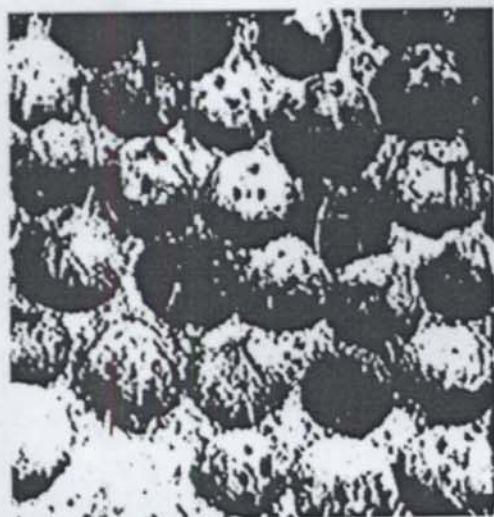
TRANSITION

THE ACTION OR PROCESS OF PASSING OR PASSAGE FROM ONE CONDITION; FROM AN EARLIER TO A LATER STAGE OF DEVELOPMENT OR FORMATION, ACTION, OR PLACE, TO ANOTHER; BRINGING CHANGE.

TRANSITION-LEAF

CODE: SYMBOLS/TRANSITION/2005-001

ROUGH TEXTURE



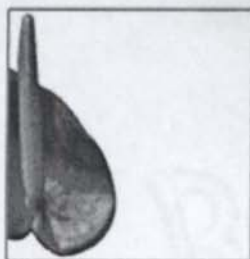
ROUGH TEXTURE

THAT WHICH PERTAIN TO THE FACULTY OF VISION OR TOUCH AND IMPARTING STRONG TEXTURAL IMAGES CHARACTERIZED BY STRONG ROUGHNESS

ROUGH TEXTURE-
COCONUT SHELLS

CODE: SYMBOLS/ROUGH TEXTURE/2005-001

A NALOGUS



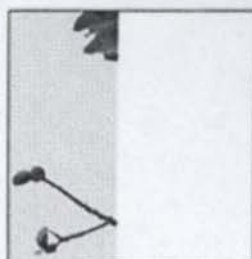
ANALOGOUS

HAVING ANALOGY; SIMILAR IN CERTAIN ATTRIBUTES, CIRCUMSTANCES, RELATIONS, OR USES. STRONG SIMILARITY COULD BE USED TO GENERATE RESTFULNESS SUSTAINING VISUAL INTEREST FOR LONGER PERIODS OF TIME.

ANALOGOUS-FLOWER

CODE SYMBOLS/ANALOGUS/2005-001

AESTHETIC



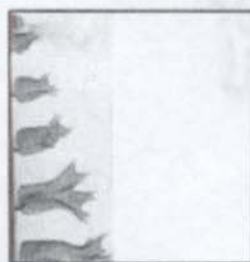
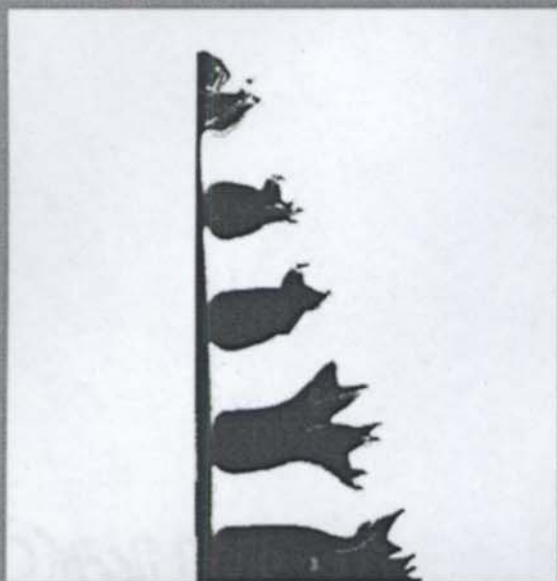
AESTHETIC

PERTAINING TO PERCEPTION BY THE SENSES AND HAVING THE QUALITIES OF THE REFINED; IN ACCORDANCE WITH THE PRINCIPLES OF GOOD TASTE; ACCEPTABLE AND BEAUTIFUL.

AESTHETIC-NJAVAL

CODE: SYMBOLS/AESTHETIC/2005-001

T RANSFORMATION



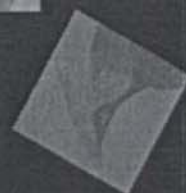
TRANSITION

THE ACTION OR PROCESS OF PASSING OR PASSAGE FROM ONE CONDITION; FROM AN EARLIER TO A LATER STAGE OF DEVELOPMENT OR FORMATION, ACTION, OR PLACE, TO ANOTHER; BRINGING CHANGE.

TRANSITION-FERN

CODE: SYMBOLS/TRANSITION/2005-001

H^{UE}



HUE

ATTRIBUTE OF A COLOUR BY WHICH IT IS RECOGNIZED AS A RED, A GREEN, Etc., AND WHICH IS DEPENDENT ON ITS DOMINANT WAVELENGTH, AND INDEPENDENT OF INTENSITY OR LIGHTNESS

HUE-FLOWER

CODE: SYMBOLS/HUE/2005-001

A SURVEY 01 – QUESTIONNAIRE

Hi dear Sir / Madam.

Please take some time to go through the following questions and answer as you please, clearly. Please return the questionnaire to me.

Thank you for the kind cooperation.

Abraham George,

Faculty, Department of Architecture, National Institute of Technology – Calicut, Kerala,

Pin 673 601. Email: regugeorge@rediffmail.com Cell No. 9447539236

Aim: To assess the problems of communication in teaching architecture to students with different backgrounds, culture, etc contributing to heterogeneity.

Note: The term Architecture encompasses Design, Theory of Architecture, History of Architecture or other design related subjects.

Name: **Year of Admission:**

Year /Semester:

Program of study: B. Arch., B. Tech. (Please specify if different):

Address and email:

Mother tongue: **Medium of Instruction:**

01. Have you had any problem in understanding lectures in Architecture?

02. Do you clearly understand the terms used in architectural lectures?

If Yes:

If No:

03. If Yes, How do you assess whether “what you understood” is same as What the teacher meant” ?

Please state:

Could you please give reasons why you did not understand the terms?

Eg. lack of clarity, Legibility, Familiarity with terms, in comprehensibility, Lack of explanation, lack of graphics to supplement lecture,

04. In your opinion, what would improve classroom teaching of Architecture?

Explanation, Illustration, Symbols assisted lecture,.....

05. Have you had similar or other difficulty in communication in classroom lectures, in Mathematics / Engineering subjects?

Yes

No

If Yes, Please specify the nature of the problem:

If No, please state reasons for better communication:

06. Please state in your opinion, How far the use of graphics, symbols or displays would improve the classroom lectures?

07. In your opinion, please record your assessment of the terms used in architecture?

Subjective:

Yes	No
-----	----

Objective:

Yes	No
-----	----

Relative:

Yes	No
-----	----

No-relative:

Yes	No
-----	----

08. In your opinion, will the use of symbols and posters with symbols representing terms in Architecture, improve communication and understanding?

Thank you so much...

B SURVEY 02 – QUESTIONNAIRE

01. Have you had any problem in understanding design discussions in architecture?

Yes	No
-----	----

02. Have you understood every word in all design discussions?

Yes	No
-----	----

If yes, please state how many words?

100%, 90%, 80%, 70%, 60%, less than 60%.....
--

03. Please write down *ALL* words and terms used in design, which you have not understood in Architecture, Design discussions, History of architecture, Theory of Design and Design.

Thank you so much...

C. SURVEY 04 – QUESTIONNAIRE

Hi dear Sir / Madam.

Please take some time to go through the following survey and answer as you please, clearly.

Please return the questionnaire to me. Thank you for the kind cooperation.

Abraham George,

Faculty, Department of Architecture, National Institute of Technology – Calicut, Kerala, Pin 673 601. Email: regugeorge@rediffmail.com Cell No. 9447539236

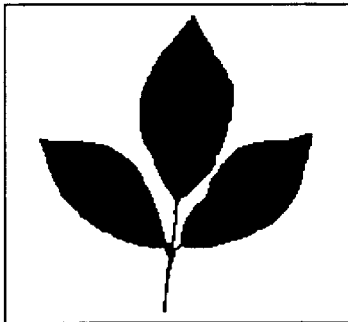
Aim: To study the effectiveness of a Symbol in signifying a word.

Name:

Address:

Email:

1. Symbol for **BALANCE**:



1. In your opinion, does the symbol shown represent **BALANCE** ?

Yes	No
-----	----

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

2. Symbol for **CONTRAST**:



1. In your opinion, does the symbol shown represent **CONTRAST** ?

Yes	No
-----	----

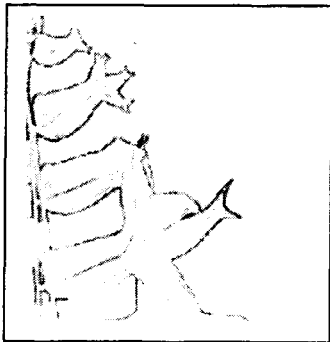
2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

3. Symbol for **GRADUAL**



1. In your opinion, does the symbol shown represent **GRADUAL** ?

Yes	No
-----	----

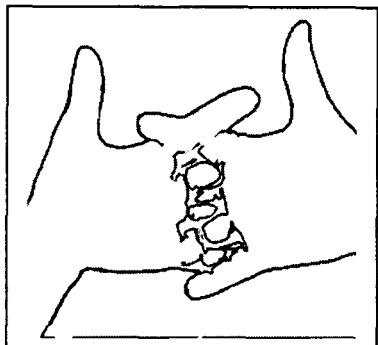
2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

4. Symbol for **HARMONY**



1. In your opinion, does the symbol shown represent **HARMONY**?

Yes	No
-----	----

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

5. Symbol for SHADE



1. In your opinion, does the symbol shown represent
SHADE?

Yes	No
-----	----

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

6. Symbol for DIALOGUE



1. In your opinion, does the symbol shown represent
DIALOGUE?

Yes	No
-----	----

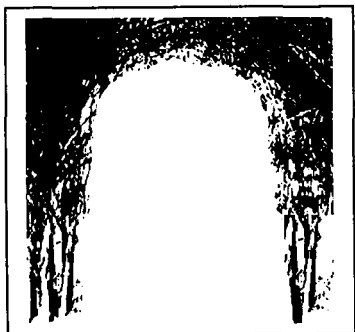
2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

7. Symbol for ARCADE



1. In your opinion, does the symbol shown represent
ARCADE?

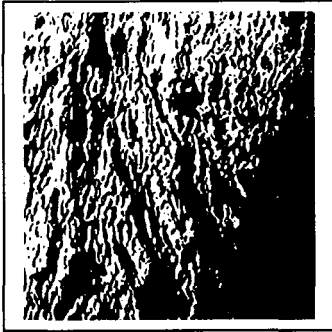
Yes	No
-----	----

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

8. Symbol for **TACTILE**

1. In your opinion, does the symbol shown represent **TACTILE**?

Yes

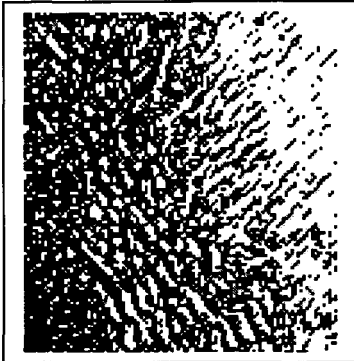
No

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

9. Symbol for **ROUGH TEXTURE**

1. In your opinion, does the symbol shown represent **ROUGH TEXTURE**?

Yes

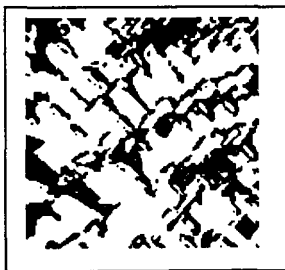
No

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

10. Symbol for **VISUAL ROUGHNESS**

1. In your opinion, does the symbol shown represent **VISUAL ROUGHNESS**?

Yes

No

2. If Yes, to what degree ?

100%, 90%, 80%, 70%, 60%, 50% less than 50%...

Please circle your answer

3. Please record your suggestions for improvement:

Thank you so much...