

INFLUENCES OF ENVIRONMENTAL FACTORS
ON ARCHITECTURAL DESIGN

by

DONALD KARL STROHMEYER

B. S., Architecture
University of Kansas, 1954

A THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Architecture
and Allied Arts

KANSAS STATE UNIVERSITY
OF AGRICULTURE AND APPLIED SCIENCE

1960

LD
2668

T4
1960

577

C.2

Documents.

TABLE OF CONTENTS

INTRODUCTION.....	1
BACKGROUND.....	2
PHYSICAL ASPECT.....	4
SOCIAL ASPECT.....	8
EMOTIONAL ASPECT.....	17
PSYCHOLOGICAL ASPECT.....	19
SUMMARY.....	21
ACKNOWLEDGMENTS.....	23
LITERATURE CITED.....	24

INTRODUCTION

Man, unlike most species of plants and animals, has succeeded in surviving in nearly every physical or geographical environment. Man is, however, dependent on nature for his social or cultural development. The lower his social development the greater his dependency on cultural development. Conversely, the higher his social development the less his dependency on cultural development. The urges and drives, man's initiating actions, needs and desires for survival in the complex world may be stimulated psychologically. Interaction between his fellow man, giving and receiving, in the social complex may tend to be an emotional value.

Symbols or comparisons, it may be said, set man apart from all other creatures. Language and articulate speech has elevated man above the level of other animals and has made him human. Man has created, through symbolism, a different environment, knowledge, custom, ritual, and sentiment to mention a few. Each generation is born and receives these symbols and, adding to them, develops a higher cultural tradition.

From the standpoint of behavior, everything depends upon the type of culture to which a child is introduced from birth. The child born into one culture soon will think, feel, and act in one way. The human species is varied and not uniform. It is reasonable to assume that there are innate psychological differences among the many races of mankind.

Man is a product of the earth's surface which not merely means that he is a child of the earth, but that the earth has mothered him, fed him, set his tasks, directed his thoughts, and confronted him with difficulties that have strengthened his body and sharpened his wits. She has entered into his bone and tissue, into his mind and soul.

Features of environment to which people most frequently adjust their lives are the natures of the climate in which they live, the character of the land surface (plains, valleys, and mountains,) the character of the soil, presence of sources of power, minerals and other material resources, and the geographical position with respect to other places and other peoples.

BACKGROUND

It is difficult to believe that human societies deliberately chose to adapt their modes of life to the climate of the Arctic or regions of the equator. This space was settled and over periods of years the few became many. Their occupations became intensified to a small degree. Survival rather than development to any high status was the keynote. The inhabitants were forced to put themselves into complete harmony with their environment.

The influence of location and climate has been discussed many times. Man, inadequately protected as he is from weather and inanimate forces, is more or less independent of the world of nature. The activities of man does not influence individuals but groups, regarded as expressions of the environment. The

concept of environment becomes more and more intricate as our knowledge of the living world increases. Man today has eyes only for himself, he is busy in the exercise of his powers.

From the earliest times it has been believed that species might be transmuted by environmental changes and that even life itself might arise from lifeless matter through the influence of favorable extrinsic conditions. If environment could exert so great an influence on the origin of species or even of life itself much more could it affect the process of development of the individual. It is still popularly supposed that complexion is dependent upon the intensity of light, and stature upon the quantity and quality of food, that sex is determined by food or temperature, mentality by education, and that in general individual peculiarities are due to environmental differences. (Conklin, 1)

Each generation gets its human equipment of tools, beliefs, sentiments, and patterns of behavior. This cultural tradition is endless. Man cannot live apart from the environment. The environment continually sets conditions to which man adjusts. Environment supplies food, drink, and air to satisfy his biological needs and it acts both directly and indirectly to influence his behavior. However, man as a living organism continually modifies his environment in a never-ceasing interaction between the two.

Adjustments between men and environment differ in three important ways from the environmental adjustments of the lower animals. First, groups of men develop and use culture and this culture plays a major role in shaping the relations of man to his physical world. Secondly, mobile men develop specialized functional areas within a wide-flung economy so that a given local areal pattern may reflect adjustments not only to immediate

surroundings but to distant parts of the world. Lastly, men live in a social world as well as in a web of symbolic relations so that their areal patterns of adjustment depend on social as well as on ecological processes.

Man's environment is more extensive than that of any other animal, as is the influence on his development. Man lives in a world of physical, social and moral stimuli which exerts a profound influence on him. Man is stimulated by present environment and also by memories of past experiences and anticipation of future ones.

The period of immaturity in man is longer than in any other animal, and it is during this formative period that environment has its greatest influence. Every individual is unique and if the best results are to be obtained he must have unique environment and training. In general the best environment is one which avoids extremes, one which is neither too easy nor too hard, perhaps one which calls for sustained effort and produces maximum efficiency of body and of mind.

PHYSICAL ASPECT

Man, as soon as he felt the need of a permanent home, built his shelter out of the materials at his disposal. He was influenced greatly by those useful materials about him. Soil conditions have determined whether the use of wood, earth or stone should predominate. The material which was used guided the hand of the user. Each material had its own requirements, its own

form, size and resistance which gave a definite character to the finished structure.

Wherever wood is plentiful it has been the most popular material used for the construction of architectural structures. Japan is an example of the use of wood because of the plentiful supply of evergreens, hinoki cypress and cryptomerias trees. The use of native materials gives the most striking example of harmonious adjustment between a building and its surroundings. The typical Japanese house resembles a wooden cage placed lightly upon the ground with interior furnishings that correspond with the structure itself.

In the arid zone clayey soil is used to make up for the lack of wood. This soil can be moulded, it can absorb substances which solidify and harden it when dried in the sun or perhaps baked in fire. Clay is a material which is easily shaped and lends itself to many uses. It has become a contemporary popular material in the form of brick. Earth and sun-dried brick have been used extensively by man, even in climates where its use is not clearly indicated.

Water is the chief agent of destruction of earth-made buildings. Stone, is therefore more commonly used so often near large bodies of water. It is more durable than wood. Stone is a guarantee of whatever permanence is consistent with human habitat.

The variety of soils has meant a variety of materials and consequently a variety of style of building. Migrating people have introduced different customs and because man migrated he

carried his home with him. Wherever man is he seeks to adapt his home to his occupation and his individual taste. The Spaniard, like the Anglo-Saxon, brought his favorite style of architecture to America. There are a number of influences stated which have a direct bearing on architectural design. Soil, materials, migration, customs, occupation, and individuality are but a few of the basic influences of architectural design.

The type of construction, in many cases, is dependent on the nature of the soil. Transportation, communication, and industrial manufacture has helped to give wide variation to design. If brick and steel were to be used in great quantity it would be one aspect of the age of coal and steel. Individual and regional differences will never be obliterated.

Environment is by its very nature limited in space. But world, present in environment, drives beyond any limited space. The world-space is open in all directions without a noticeable or even imaginable end (whatever physical theory may say about the limited space of the universe.) . . . At the same time the narrow place is the protected place--the mother's womb, the cave, the narrow streets of the wall-protected medieval town. The modern functional house with its large open glass walls seems to express the same courage which has conquered the space above the surface of the earth and is conquering the cosmic space itself. But man remains man, and often just in contrast to his wide openness, needs the place which is a separated part of endless space to give him a feeling of psychological as well as physical protection. (Tillich, 3)

Shape of buildings, building materials, and adaption to mode of life, rural or urban, have a relation between man and environment. The farm buildings are quite different from the

city buildings also as to function. Site is an important influence and can be more clearly seen when other more basic relationships are pointed out. If permanent establishments are either lacking or infrequent, there is quite a different looking landscape. There are breaks in continuity and open spaces are to be found. The environment is different than the environment of more permanent rural areas. Rural communities are usually oriented toward the city and it is the city which controls the relations between rural communities.

Connected again with this problem is that of environment and conformity. . . . Settlement after settlement with little distance between them, each with exactly the same model of house, small differences in color and design, each for itself in immediate vicinity of the others, each surrounded by a small garden. The whole thing seems to me a disturbing symbol of loneliness in a crowd, breeding as well as confirming the patternization of present-day industrial society. The impression given by the metropolitan apartment house developments is different. They lie more in the direction of mass concentration, but they seem to leave more freedom for individual non-conformism--as big cities always do. . . . (Tillich, 3)

It can be stated that man cannot accept monotony in architectural design. It is true that housing projects many times are developed to the degree that each and every house is of the same size, shape, and overall design but man in his own way fights this by planting a simple tree in his yard.

To make man accept one type of architectural design for churches, one for houses, one for any and each type of building, he would first have to accept the idea that all automobiles be designed in one manner, and every other manufactured product would have but one solution, including all of natures many

wonders. Man cannot control nature; likewise one man or group of men cannot control architectural design.

A building, whatever its purpose, can be built in any part of this country or the world and be made to function properly with little thought of architectural design. The temperament of the people may differ but the architecture need not.

Since man first met other forms of life and shared a natural environment with them he has been dissatisfied. He has constantly altered, changed and re-arranged his needs and purposes. Today there are few areas in the world where man is still completely dominated by his environment. For the most part he is at least equal to it and manipulates small sections of it at will to make a more comfortable world. In the centuries ahead it is to be expected that he will eventually gain complete control over his total environment.

But these are physical aspects. Man must also live as an individual in groups of many sizes and as he alters the world he lives in, his needs, and the needs and purposes of the people in his society become controlling influences on the manner in which environment should be handled. New fields of thought are required here and the ultimate goals of man become a part of the picture in re-arranging the world to his liking.

.....

Architecture is the creation of a total environment within which can be accomplished the aspiration of man.
(Swinburne, 2)

SOCIAL ASPECT

Similar conditions of soil, hydrography and climate would tend to make a given type of settlement, once established in a region, the dominant one, because of the necessity which the inhabitants would feel of living together in mutual adjustment. The numerous daily relationships which grow up between inhabitants

of the same region do not admit of any departure from the manner of grouping and housing characteristics of the prevailing mode of life. The law of mutual adjustment is especially rigid in irrigated districts where everything is subordinate to the life-giving element to such a degree that there can be no manner of grouping, no arrangement of buildings other than that providing for the common enjoyment of water, whether of ponds or streams.

Knowledge is not proportional to opportunity in the sense than an individual's degree of knowledge can be foretold from his degree of opportunity, as wealth does not always create wealth, a good home does not always make good children. The product of the environment is always a result of two variables, it and the man's nature.

The environmental stimulus adequate to arouse a certain power or ideal or habit in one man may be hopelessly inadequate to do so in another. Each man in part selects his own environment. As this world's nature selects for survival those animals which are adapted to live in it, so any individual selects, by action, attention, memory, and satisfaction, the features of the environment which are to survive as determinants of his intellect and character.

To the real work of man for man, the increase of achievement through the improvement of the environment, the influence of heredity offers no barrier. However, to the popular demands from education and social reforms it does. Man does not rejoice that he and his children are healthier, happier and more supplied with pleasures than were his ancestors of many years ago. His

complaint is that he is not as well off as some of those about him.

The results for which a rational mankind would strive are determined largely by mankind itself. For the common good it is indifferent who is at the top, which men are achieving most. The important thing for the common good, for all men, is that the top should be high and that much should be achieved. To the absolute welfare of all men together education is the great contributor. The results for which a rational mankind would strive are determined largely by mankind itself. Man needs especially to remember that for the more primitive and fundamental traits in human nature such as energy, capability, persistence, leadership, sympathy, and nobility the whole world affords the stimulus that is present well-nigh everywhere. If a man's original nature will not respond to the need of these qualities and the rewards always ready for them, it is vain to expect much from the paltry exercises of the schoolroom. The channels in which human energy shall proceed, the specific intellectual and moral activities that shall profit by human capacities, are less determined by inborn traits. We can not create intellect. We cannot double the fund of human sympathy, but we can keep it clear of sentimental charity. Morality is more susceptible than intellect to environmental influence. Moral traits are more often matters of the direction of capacities and the creation of desires and aversions.

The one thing that educational theorists of today seem to place as the foremost duty of the schools--the development of

powers and capacities--is the one thing that the schools or any other educational forces can do least. The one thing that they can do best is to establish those particular connections with ideas which we call knowledge and those particular connections with acts which we call habits.

What is true of musical behavior is true also of linguistic behavior, or monetary, mathematical, architectural, philosophic, religious--in short, of any kind of human behavior. Human behavior is the response of the organism man to a class of external, extra-somatic, symbolic stimuli which we call culture. Variations of human behavior are functions of a cultural variable, not of a biological variable. Human behavior as we find it amongst the various peoples of the world is to be explained therefore in terms of their respective cultures rather than by appeal to "human nature" or psychological tendencies.

Culture is an organization of phenomena--acts (patterns of behavior), ideas (belief, knowledge), and sentiments (attitudes, "values")--that is dependent upon the use of symbols. Culture began when man, as an articulate, symbol-using primate, began. Because of its symbolic character, which has its most important expression in articulate speech, culture is easily and readily transmitted from one human organism to another. Culture is, therefore, a symbolic, continuous, cumulative, and progressive process.

Man has long been a social animal. Today he proudly dominates the earth. Man has so successfully adjusted himself to environment that he has outstripped all competitors. Never

in his long struggle upward in the past or at the present time has he been or is he free from his environment. His civilization, culture, and all in which he takes pride depend upon environment.

Perhaps the effects of environment on man are most apparent in what is commonly known as climate. The earth is said to have different types of climates because there are variations in temperature, moisture, wind, light, and other factors. It is "human nature" to long for stability. Man is apparently not at his best in a monotonous climate; nothing extraordinary develops in monotony. The great cities and the aggressive peoples of the earth live in temperate regions where the climate is variable. Where the conditions of life are severe, men expend most of their energies in barely living, but where there is an abundance of food and a climate which varies enough to stimulate man to activity, culture may reach an advanced state. On the wind-swept arctic barrens or on the Sahara Desert there are no great cities, cultures, or universities. The Amazon Basin has bountiful supplies of food and an equable, moist, climate. It has not produced an outstanding civilization. The people there have been shown by physiological experiment to live at a slower rate than comparable men in temperate zones. While the scientific evidence is not very complete or conclusive, it indicates that the human race is not very productive in any hot climate, whether it be moist or dry.

In all climates man has long attempted to keep the immediate environment of his body more or less uniform by wearing clothing,

erecting wind breaks, and living in natural or artificial shelters. He has thus protected himself from extreme changes and been able to increase his productiveness because he was able to work without being interrupted by the weather. Perhaps modern city life is too monotonous. When people live in steam heated apartments where there is insufficient moisture and little variation they are apt to grow stagnate. Air which is warmed without being moistened dries out mucous membranes and paves the way for colds and chronic diseases. Tuberculosis flourishes among those who live indoors in dust and darkness.

As the environment furnishes the exigencies of life for man--food, shelter, and opportunities for producing offspring--he has an obligation to protect and conserve it. Man by his presence is often able to modify the environment so that it becomes more favorable for him or on the other hand he has often carelessly destroyed his natural resources and his heirs have suffered in consequence. Timber lands have been ruthlessly cut over on many parts of the earth and it will be many years before such areas are again made productive through the application of scientific forestry. Lakes and rivers have frequently been so polluted with sewage and factory wastes that the aquatic animals in them have died. Sometimes man's activities produce remote effects which do not at once become apparent.

The soil is the source of the bulk of the daily food of indigenous peoples in all parts of the earth. Its character determines the types of crops which may be successfully grown and this in turn influences the types of civilizations which may

develop. Rice-eating peoples lead quite different lives from those which subsist largely on wheat. An inland prairie is usually thinly populated and is devoted largely to grazing for large herds of big animals. A luxuriant forest near the sea is densely populated by men who fish, hunt, plant gardens, and raise small domesticated animals. The daily life of man frequently depends to a considerable degree on the character of the soil.

Particular environments act the patterns for evolution and influence the adjustments of animals and in turn they influence the cultural and social adjustments of man. The human race, like other groups of animals, rarely makes progress by throwing off all old types of adjustment, all habits and traditions, and leaping suddenly into a new environment, but usually advances by the slow modification of what already exists. When man changes his environment by adding to or subtracting from it, he should do it thoughtfully, tentatively, and carefully. Man should be very careful when tampering with his environment. Before making any changes those in authority should consult scientists, artists, business men, ministers, and any others who may have worth-while opinions on what the effects of such changes will be on the natural resources, health, and happiness of all concerned.

In the environment of modern man one of the most important factors is in the contacts which each individual has with other men like himself--what is commonly called "society", but perhaps better "social interaction", because the former word carries certain invidious associations which are concerned with affairs

that relate largely to style and fashion. Every social interaction must have certain generally accepted customs. The higher state of culture a society reaches, the more is originality or imagination penalized. When a group of social customs have once been established by long evolution through countless ages it is very difficult to change them. Though such inertia is proper and essential, and though all members of a society must expect to observe established customs if they intend to succeed, each individual should remember that the end of social interaction is not to be like others and thus be accepted as a member of society. Social interaction enables man better to survive. It is one means of surviving and gaining the exigencies of life. Many persons in modern society spend their lives in being like the other fellow. They go to school and learn what others know and to think what others think; they attain maturity and with some effort learn to smoke cigarettes in order to show that they are red blooded men or women; they rear children and train them to be like themselves; they die and are buried according to accepted customs. Viewed from this angle society makes a pathetic spectacle. Its end is not to make all of its members conform to average standards, but it often operates in this manner.

Parents and children learn to observe certain customs and perhaps establish laws which enable them to live together in more or less peace and harmony, and gain the strength of unity and with numbers accomplish more than is possible for individuals. Relatives have a certain degree of brotherhood; clans and tribes grow by the association of families; nations arise from racial

stocks which occupy suitable areas of the earth's surface; leagues are formed to further the common interests of nations.

Ability is the power to accomplish things in the modern social environment. An able man usually has personality and character, but he may have many qualities which seem undesirable to his fellow man and yet be an outstanding individual on account of the possession of an unusual degree of some particular quality, such as intellect. It is true that abnormal personalities are found in prisons, universities, sanitariums, legislatures, asylums and pulpits. What most men strive for is to be average but at the same time outstanding.

Every man is born with given potentialities, or abilities, which may to a certain degree be developed or suppressed by environment. Man has perfected the finest technique for adjustment through the opportunities afforded by his social life and his education. A man's responses to environment are to a considerable degree adjustments to social customs. The success of each individual depends to some extent on opportunity to obtain education in conventional methods of behavior in society and in part on ability to fit into social situations.

The proper environment must not only supply the exigencies of life, so that man may live in comfort and safety, but also afford opportunities to encounter the variety, uncertainty, and struggle which gives spice and flavor to existence. A man who lives in assured monotony endures bovine contentment or bored discontent. If one strives to make his environment such that he always works to the limits of his powers he continually increases

his abilities. As the years go by he takes on new and greater responsibilities, he becomes more powerful and exercises more control over his environment. He lives in greater ease and safety; he passes laws and inaugurates customs which improve society and civilization.

Environment may determine the difference between a parasitic criminal and a productive genius. The administration of human society should involve the provision of such an environment that all children have opportunity to develop the best that is in them. Environment is not an inflexible mold which forces mankind into horrid and fantastic forms, but a plastic medium which furnishes the materials for making man ever more beautiful.

EMOTIONAL ASPECT

As a rule, an individual's behaviors, beliefs and attitudes grow and change only to the minimal extent that is called for by the demands of his immediate situation in life. All that is required is that his daily behaviors and his daily perceptions have meaning and integration. When an individual is confronted not by an expected change in role, but by a chaotic external environment to which he cannot adjust with emotional satisfaction, and which he cannot explain to himself, he is impelled to seek a new adjustment--which relieves his tension. He tends also to seek a new explanation of his changed environmental situation, and this new explanation relieves his tension.

Families may migrate a great distance, but preserve their

usual habits of family life, or an individual, upon entering a new country, may begin to do new work but of a type which has been defined as appropriate for anyone from his country, so that his sense of his national identity is strengthened even while the work itself is new and strange. In very complicated situations, in which technical changes cannot be fitted into an existing community or family framework, it may be quite possible to find in operation institutions or existing patterns of interaction which have sufficient similarity to the new desired behaviors to make the introduction of change easier.

The agents of change have a wide choice of methods: they can attempt to influence the perceiving individual directly; they can alter the environment so that it will in turn alter his perception; they can create situations within which he will continue to remain in contact with the new situations; they can attempt to satisfy the needs and emotions which lie at the root of the existing behaviors in a way which will include the proposed change or they may create social support for the individual who adopts the new behaviors. Taken together, these methods involve working through many or all of the personality-forming agencies in a society--institutions, individual people, objects.

As our social standards change and our sensibilities become more refined, our ideas as to what is pleasing also change. What formerly was an acceptable design may at a later time come to offend our aesthetic tastes. Likewise, some advanced design which we do not now approve may in the future come to satisfy our desires. In this process it is of importance that rights of

property are not sacrificed to the pleasure of ultra-aesthetic tastes.

The idea of durability in connection with buildings of stone is deeply rooted in the human mind. When man wished to prolong his life or the remembrance of it after his death, to project his personality, as it were, beyond the bounds consistent with his brief existence, he resorted to the use of stone.

PSYCHOLOGICAL ASPECT

It is reasonable to suppose that there are some innate psychological differences among the various races of mankind. One must not be misled by appearances. The differences among races which are most easily observed are confined to superficial physical features such as color of skin, color and shape of hair, size of lip, shape of nose, and other similar features. In basic features, such as the nervous, glandular, and muscular systems, blood, bones, and sense organs, they are impressively uniform. From a biological standpoint, the differences among men appear to be insignificant indeed when compared with their similarities. From the standpoint of human behavior, all evidence points to an utter insignificance of biological factors as compared with culture in any consideration of behavior variations. As a matter of fact, no variation of human behavior is due to a variation of a biological nature. In other words, in the whole range and scope of human behavior, differences of customs or tradition can nowhere be correlated in a functional sense with differences of

physical structure.

This must not be confused with another question, that of how far original nature limits absolutely an individual's total mental growth. Original nature might make the same environment produce from one a biologist and from another a chemist and still not prevent two different environments from making the first a chemist and the second a biologist or leaving both wild savages. The environment may always work to increase or diminish original differences, though how far it may do so is a question. But that environment can alter original natures and mask their intrinsic qualities gives no reason to deny the existence of these qualities. Their existence, their extent and their degree of specialization can be discovered only by a comparison of individuals subjected to the same environment.

.....

Further, occupation determines considerably the place and district of our dwelling, its character and type, its furniture and equipment. Occupation determines our budget of income and budget of time; the hours of our working, recreation, getting up, and going to bed. It influences the character of our meals, and recreations, that of our reading and amusements. It fashions our habits, our ethics, our manners, our etiquette. It determines considerably with whom we are associated, whom we meet, with whom we talk and are in contact. All this being taken into consideration makes apparent the enormous influence of occupation on the whole physical, mental, moral, and social nature of man.

It would be really miraculous if even innately similar individuals placed in different occupational environments, became identical physically and mentally. Only the occupational agency of environment has been outlined here but it is only one among many factors out of which the environment of the upper and the lower classes is composed. Hence, the general conclusion is that a great many differences--physical, mental, moral, social and in behavior--among different social classes are due to the heterogeneity of environmental factors among which they are born, grow, live, and work. (Swinburne, 2)

SUMMARY

To build wisely as well as efficiently, we must learn more of man himself, or life itself. We must study man, individually and collectively, in all his variations, in order to know how to build for him. (Swinburne, 2)

Accepted basic requirements of an architect are imagination, draftsmanship, color sense, knowledge of structure and materials, taste and a cultural background of history, literature and the arts. Additional requirements brought about by practise and changing influences are the importance of mechanical equipment and its design, the advent of new materials, the advent of new methods, governmental influences and public demands.

In architectural design the client is a large factor which influences design. The problems of the client are the natural consciousness of cost, the lack of architectural education, little realization of the architect's services, preconceived ideas and weaknesses inherent in all human beings, (emotion and personality). Qualifications for the architect in overcoming these problems are the mastery of his profession, common sense and judgment, tact and knowledge of human relations, a sincere interest in the client's problem, recognition of costs, salesmanship and honesty.

Other factors which influence architectural design are in the development of research techniques. The reasons for this development are the industrial revolution, complex society and its needs, technological advances, increasing complications in building requirements, the constant development of the sciences

in their relation to building design, the necessity for intelligent selection of materials and techniques, and the necessity for eliminating waste.

The architect must study man so that while designing these tremendous structures for all people and all activities he can be sensitive to their needs. He should not be in error and design monuments to himself. Architecture is a creative process and cannot be reduced to a series of rules or one man's philosophy. The architect by virtue of his position and training should be the professional with a full perspective of society as it relates to needed changes in its environment. Continuously he is called upon to change the world working together with planners, engineers, economists, and governments. Individual and regional differences, however, will never be entirely obliterated.

Influences of environmental factors in architecture as stated are physical, psychological, social, and emotional aspects of man.

ACKNOWLEDGMENTS

The author wishes to express appreciation to Dr. Murlin R. Hodgell, for instruction and guidance in the field of his endeavor.

Appreciation is also expressed for advice, understanding and assistance received from Professor Emil C. Fischer.

A great thanks to Shirley, my wife, who labored and gave so much time and understanding to the author.

LITERATURE CITED

1. Conklin, Edwin Grant
Heredity and Environment in the Development of Men.
Princeton: Princeton University Press, 1922.
2. Swinburne, Herbert H.
"Architecture. . . . A Re-Definition." Research for Architecture, Proceedings of the AIA-NSF Conference, Ann Arbor, Michigan, March, 1959. Edited by Eugene F. Magenua, Washington: AIA, Documents Division, 1959.
3. Tillich, Paul
Environment and the Individual. Journal of the AIA.
Washington: Octagon Press, June, 1957.

INFLUENCES OF ENVIRONMENTAL FACTORS
ON ARCHITECTURAL DESIGN

by

DONALD KARL STROHMEYER

B. S., Architecture
University of Kansas, 1954

AN ABSTRACT OF A THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Architecture
and Allied Arts

KANSAS STATE UNIVERSITY
OF AGRICULTURE AND APPLIED SCIENCE

1960

The architect controls a small part of the environment. Everything, everywhere, anytime is environment. Features of environment to which men most frequently adjust their lives are the nature of the climate in which they live, the character of the land surface (plains, valleys, and mountains) the character of the soil, presence of sources of power, minerals and other material resources, and the geographical position with respect to other places and other peoples.

The term environment seems simple but actually it is complex and perhaps difficult to understand in some instances. For man, environment is made up of those elements of his surroundings which are relevant to him. The same surroundings are quite different for different kinds of individuals. If a southern hillbilly is taken out of his surroundings and moved into an apartment within a new housing project, he will bring influences of the old environment into the new surroundings. This may be said to be the influence of surrounding on the individual.

Man, as soon as he felt the need of a permanent home, built his shelter out of the materials at his disposal. He was influenced greatly by those useful materials about him. Soil conditions along with climatic conditions have determined whether the use of wood, earth or stone should predominate. The material which was used guided the hand of the user. Each material had its own requirements, its own form, size and resistance which gave a definite character to the finished structure.

Wherever wood is plentiful it has been the most popular material used for the construction of architectural structures.

Japan, is an example of the use of wood because of the plentiful supply of evergreens and hinoki cypress. The use of native materials gives the most striking example of harmonious adjustment between building and its surroundings. The typical Japanese house resembles a wooden cage placed lightly upon the ground with interior furnishings that correspond with the structure itself.

In the arid zone clayey soil is used to make up for the lack of wood. This soil can be moulded, it can absorb substances which solidify and harden it when dried in the sun or perhaps baked in fire. Clay is a material which is easily shaped and lends itself to many uses. It has become a contemporary popular material in the form of brick. Earth and sun-dried brick have been used extensively by man, even in climates where its use is not clearly indicated.

Water is the chief agent of destruction of earth made buildings. Stone, is therefore more commonly used so often near large bodies of water. It is more durable than wood. Stone is a guarantee of whatever permanence is needed with human habitat.

The variety of soils has meant a variety of materials and consequently a variety of style of building. Migrating people have introduced different customs and because man migrated he carried his home with him. Wherever man is he seeks to adapt his home to his occupation and his individual taste. The Spaniard, like the Anglo-Saxon, brought his favorite style of architecture to America. There are a number of influences stated which have a direct bearing on architectural design. Soil,

materials, migration, customs, occupation, and individuality are but a few of the basic influences of architectural design.

The type of construction, in many cases, is dependent on the nature of the soil. Transportation, communication, and industrial manufacture has helped to give wide variation to architectural design. If brick and steel were to be used in great quantity it would be one aspect of the age of coal and steel. Individual and regional differences will never be obliterated.

There are four aspects of environment which should be considered by the architect in the planning and design of his project. The first aspect of environment is the physical need; the next to be considered is the psychological need. Thirdly, he must regard the emotional aspect and fourthly, the social aspect of environment.

These four aspects can be thought of as body, mind, soul, and heart. The influences of environment will fall into one of these aspects, physical or body, psychological or mind, emotional or soul, and social or heart.