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A DORMITORY FOR M.I.T. GIRLS

"A Humanized Machine
to House
the Machinized Human."

By

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For the Degree of M. of Arch.

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May 21, 1947

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Dear Sir:

This thesis entitled "A Dormitory for M.I.T. Girls or a Humanized Machine to House the Machinized Human" is submitted in partial fulfillment of the requirements for the degree of Master in Architecture.

Respectfully yours,

Li Ying
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Acknowledgement

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THE PRELUDE - AN AGE OF CHAOS AND THE HOPE BEYOND

This is Machine's Age, or materialistic age, an age of quantities. All interests are in matters that can be measured, numbered, and counted. The rest are neglected, out-cast or simply considered as non-existing. So are our Time, our Space and our Human Feeling. By time, I do not mean the seconds and minutes denoted by the clock, and by space, I do not mean volume or body with depth, width and height.

Machine is powerful and it brings us a new scale. It is strong, it conquered the West and is aiming at the East,---this wild uncontrolled, spoiled "horse". It progresses and progresses---. It produces objects after objects. Beware, humans are going to be turned into objects too.

The society has surrendered. It adapted the whole mode of life to the pace and the capacity of Machine. The tempo of life has been changed into quick staccato and it has lost its organic rhythm. The rhythm of day is punctuated by the "clock", irrespective of strain or fatigue. "Wheels rather than love and hunger made the world go round."
Human relations are established on the basis of machinization, mutual dependence instead of understanding. Divisions of labor gives birth to one-sided individuals. Human beings are turned into machine or part of a machine and has lost his status as an individual. Energy and material and even human himself are misused. Man is but victim of specialization, slave of routine, prisoner of hours and forced labor of machine. Yet, few of us realized that something is rotten. We fight for rights. It caused the battles, the wars, but there is one right that we all are born with. We lost it on our journey. And it is forgotten - the joy of living.

Living in and being part of this age, we are but lost ships without rudders sailing the uncharted sea. Our spontaneous impulse is striking against the external regimentation. This is the cause of disintegration.

Yes, this is an age of chaos, a stage of transition, when the old culture has passed away and yet the new has not grown up. As Matthew Arnold said, "--between two worlds, one dead, the other powerless to be born." But, anyhow a civilization should be able to find expression through its own arts just for the struggles that are going on.
A new epoch should begin. To-day is the time for action. Try to recreate a framework of life so that our leisure, our work and our culture will be as nearly as possible one. Nature grants us "life". Why couldn't we be the Master of our own life, a whole life, not a piece of it.

It is true as Prof. Kepes said, "---as a stranger to this new and broaden world unable to comprehend it as an integrated whole, man is afraid-----. Amassing detail after detail he never achieves the whole".

So let us remove the barricade on the way to many-sided individual experiences and open up the various avenue of life. A human development is the crystallization of the whole of his experience. Each element in life plays a part in the composition of culture, one part helps to express the other. They should be one unified by the aim and for the pleasure of life. All helps to widen the physical horizon and spiritual capacity of human animals.

Frank L. Wright said, "---Our salvation and protection depends upon the realization that if science is carried far enough and deep enough we will find that Great Art
is a sure significance of all that science can
ever know---. We will likewise find that philosophy
itself is the science of man from within. No science
can be fruitful until Art, Religion, Philosophy,
Ethics and Science are comprehended and comprised
as one great Entity or at least Universal Unity."

In spite of the seeming confusion there is neverthe-
less a true but hidden unity, a secret synthesis,
unconscious and inert. Behind this veil of mist,
there is warm delight --- waiting. Let us work.

It is the Task of architects, the planners of "life"
to heal this wound, this separation of "thinking"
and "feeling". Help the blind to help themselves.
Try to clasp to their hearts the truth, the beautiful.
ON ARCHITECTURE

Years ago, Le Corbusier discovered, "a house is a machine for living." That was the time when he first found the promise of machine, the "conditioned air", new structure, new materials---etc. and etc. Since then, this phrase has been used and misused.

Now our problem is how to build a Humanized Machine to house the "Machinized" Human. --- An architecture of manhood. By "Humanized Machine" I mean that it should be a machine with all its function and beauty has human imprint. As to "Machinized Human", I will say, it is the victim of this Machine's Age.

The hours of steam power and electric power are spending out. Atomic power has shown up in its first act. Each epoch shall have its own spirit.

Architecture has a history, not a compilation of facts, but an insight into a changing world, changes of attitude, interpretation---etc. It goes hand in hand with human history, human progress. Mutually influenced and inter-expressed. It is an unconscious record of community's life, its interests, its tastes,
its economics organization, its social order, its belief, love, hate and what not. It is dynamic. It has traditions, an uninterrupted chain of new findings, inventions accomplished over the ages. Each link reinforces the other, makes a direction, prepares a way for further progress, more creations. Each has its contribution. None can be forgotten or ignored. The result of admixture of new growth is our civilization, still moving, still proceeding. Buildings are the mile stones on the roadside of human progress. If building are alive each piece of stone can tell a story, whisper a melody. Really it can.

Lewis Munford thought that "our present mechanical architecture is a sort of structural Esperanto, it has a vocabulary without a literature, and when it steps beyond the elements of its grammar it can only translate badly into its own tongue the noble poems and epics that the Romans and Greeks and Medieval builders left behind them."

What is architecture, one may ask. It is human's work in complementary to Nature's. It can not substitute (wax flowers are awful) and it can not
contradict the gifts and the laws of nature. This artificial environment orients itself in the natural surrounding. It is a shelter from the undesirable the rain, the snow, the wind—etc. But it is more than this.

Architecture strikes the same aesthetic and human chord as sculpture and painting appeal to by themselves. It seeks to give pleasure in sensory experience, lead man to a security of feeling. It will satisfy his needs, spiritually as well as utilitarian. It cultivates both body and mind.

It is a sculpture of space with man plays a part in it— an important part. As Scott said, "--Painting can despict space, poetry can recall its image, music gives us its analogy but architecture deals with space directly". It is a sculpture with the interpenetration of interior and exterior, and every varying view point (not fixed stand point) will offer the widest visible comprehension of space.

It differs from painting because the observer is in the image. The perspective is always changing. One sees, one acts, one feels, as one moves. Each
individual line, plane, mass is important and the "coherence", the composition or the integrated whole is important too. All of them when well designed will inspire not only the feeling of three dimensions but four. And the last is the most important.

It is more than an objective art. It fuses and blends together man's feeling (mood), thinking (knowledge) and action (movement) to express all phases of his existence. One lives more "nobly" surrounded by his own reflection, his own imprint, because then he has confidence of his own existence, his belief, and self assurance of his own power. He can integrate man, place and time and his existence will flow into historical continuity.

Now, great works of the past, we envy. How can we make our own sublime. Years and ages might pass but Nature is continuing - the eternal. As long as sun and moon are taking their alternate guards, trees are growing, streams are flowing, human beings are living. They still think, feel, and sense and their hearts are throbbing. And they have needs both physical and spiritual. Here we have our language, lines, planes, space, masses, color———, as our
medium, new and old materials, and as our tool, machine, and as our background, the human civilization. We should start.

The task now is to see the extremes, and try to keep equilibrium, the synthesis of romanticism and functionalism, humanism and mechanism, the external forces and the inner soul, the organic the inorganic, man and nature, individual and society.

"Extremes destroy life, for life steers a middle course between extremes. Equilibrium indicates the presence of continuous and unfailing motion—. Equilibrium is the point where all forces meet and resolve themselves—poise"—said Le Corbusier and also Lastzi.

"In Nature, a complete deliverence from tragic feeling is not possible. In life, where the physical form is not only necessary but of the greatest importance, equilibrium will always be relative. But man evolving toward the equilibrium of his duality will create in even greater degree in life as in art equivalent relationships and therefore equilibrium, social and economic life to-day already demonstrates his effort toward an exact equilibrium. Material life will not
be forever menaced and made tragic. Nor will moral life always be oppressed by the domination of material existence." - Kepes.
Machine Should be Praised Not Condemned

Machine is not the one to be blamed for the conflicts, the unused potential energies, ill-organized and maladjust humans. It is the human himself who misunderstood his own work and is now afraid of it.

"Machine is a marvellous tool. It must remain our tool, not become our master," said Aalto. Our decay, the dullness of our life is caused by our own weakness which change ourselves into mere puppet.

When man was confronted with a complex task he will look backward to find some solution from the past, to borrow wisdom from the distant culture. It seems that our forefathers lived more happily, more healthy. But---revival is a lie and the return to primitive stage is not allowed by the march of time. To hate machine is another mistake made by the blindly rebellious men taking revenge upon themselves for their own mistakes.

Man had made a mistake by a wrong choice between Master and Slave he changed himself from creator of machine to that of creature of machine system.
Considered himself as "an object among objects" as Keres said. Now he should never another mistake make. Try to study, to understand, to order, and to reconquer this wild active power, is the remedy of our chaotic age. To restore the equilibrium of own own life destroyed. To keep the progress of machine in pace with our own organic forward movement. To progress with an aim, a direction.

Lewis Munford said, "--Machine is just as much a creature of thought as the poem is as much a fact of reality as the machine.

Machine permits us to penetrate the mysteries of the universe, the field where human capacities could never reach. To enjoy large scale as well as minutes. It enlarges the sensory capacity of our human body.

For the speed of producing "good" things, the cleanliness, the perfection, the precision, the beauty of new forms, the possibilities of new materials, we shall praise machine.

If it is not misused it can help us to express our joy of existence to integrate ourselves to our
surroundings more decently, more thoroughly. Because it has opened a new horizon of this "visible world", "Machine can be humanized".

"Machine was a counterfeit of nature analyzed, regulated, narrowed, controlled by the mind of men. The ultimate goal of its development was however, not the mere conquest of nature but her resynthesis" said Munford in his Technique and Civilization.

The aim of machine is to release us from our physical burden and grant us leisure. Prefabrication is a good example.

New technique, new materials, machine's work should be understood and used. But we should remember the aim is to use their characteristics to express human not as an advertisement of their characteristics. I hate to see that curves are used without feeling just because they want to show off that fluid character of concrete.
Man has six senses, while architecture consciously and unconsciously touch three of them — visual, tactile, and subconscious.

Thirty years ago Scott preached — a building is a vital experience one does not merely see it with one's eye, one breathes it, one feels it, one adjusts the muscles to it, one's mood is lowered or heightened by it.

When man believes in something, that's truth, reality, and beauty, he presents his conceptions through different mediums. This is the voluntary action of the "artists". He strives to come to terms with aspects of the space time events, ever changing. He can not and tries not to "see" to "feel" for the beholders. He but tries to express the significance of life.

Through the objective image in the beholder's experience the conception is translated into perception. And this act of translating is determined by the interpretation of the mind.
To perceive is creation too, to synthesize a collection of phenomena, to organize the sensation, to find the interaction between the physical forces and the internal self, to get the relation between two worlds, one around us and one within. This is what we meant by physiological and psychological "response" to the sensation and it shows how architecture appreciation is formed.

"Human vision is not merely a mirroring of external reality, a simultaneous emotional response where in every act of perceptions this response is determined not only by the things which are represented but also by the visual qualities which are the vehicles of their representation. Vision thus has always a double component; the perspective of the objective world or life as it is and the perspective of the beholder with his aspirations, dreams and passion or life as he would like to see it. The true visions of reality lies in the conference of these two, it is life seen not only through the eye and intellect but also through the heart", said Kepes.

By conceiving and perceiving human beings exchange their findings, they try to communicate and to
understand, and their creative power imaginations
and human relations grow hand in hand.

I believe that all men are born with sense of
beauty. Everyone is equipped by Nature the ability
to receive and to assimilate sensory experiences.
Everybody is sensitive to tones, to color, to space.
The sensitiveness of the public is dulled or even
ruined. The work of children and of the primitive
with spontaneous expression spring from the deepest
pit of their heart, from their inner sense unshaken
by external influence, prove to us all men can be
re-awaken from the mid-night of a dark age. So I
believe in re-education and I still dream of it. En-
vironment moulds man and we can mould the environment.
Want a task! What a pleasure! All revolutions
should be radical, that is it should start from the
roots hidden under the dust of old. But the transition
should be human. Human beings have the love of old,
but they are fond of the new too if the new is a con-
tinuation of the old. They like to see the change,
the sign of their own progress. When one tries to
restore the sense of aesthetic which will nobly relate
man to his environment, one must beware of rebellious re-
action. Forced re-education will cause hostility and
make the purpose in vain. The "influence" should be applied unconsciously, because a conscious perception is always a forced one while an unconscious is natural. Architecture is the tool.

In architecture perception and conception is not a simple action of give and take. The designer is the one who crystallizes from his knowledge, his feeling, the ideas, and the conception, the builders interpret it and carry out, the beholder will be the inhabitant. So it is a composite result of efforts from different sources. The architect is responsible for it. So he must predict and try to foresee to imagine the response when he draws a line, set a plane, organize a mass, use a color, a form, a material. This is not only going to be his conception expressed, he should put himself in the biological, economical and social planes of the ones he is serving. He must know its past and feel its future in order to serve.
It seems manifold the appreciation of architecture which addresses us through immediate impression rather than through the process of reflection. The human moods and the atmosphere of the houses are interwoven. One can not distinguish definitely which is the cause or effect. They are interdependent.

Everything is something, but it appears to be something else and it is felt to be another. This "feeling" is determined by our mind, our heart. This "appearance" is the reporting sensation if wrong it is called optical (or other sensal) illusion. And the "being" is determined by our knowledge. For instance, a very tall column is measured to be 1 ft. in diameter; it might appear larger with a dark background and it will stir a feeling of weakness when one sees the load on it. Another instance is, a color say our knowledge tells us it is pure red, and we look at it for a long time, without contrast the color fades, it does not appear to be as red as it should be, and by looking at red color a mood of warmness, activeness—etc. arises.

Our technical knowledge supplies us the "being" and
we should start out to understand the "appearance" and the "feeling" in order to create an environment.

**Visual - Dimensions**

It is human nature seeking always for rhythm, balance, harmony and unity.

"Our eyes demand completeness", said Goethes, Lipps and psychologist Vernon Lee developed a theory of Aesthetic - the habit of projecting the image of our own functions upon the outside world of reading the ancient common and profound. It is in fact the natural way of perceiving and interpreting what we see. To perceive and interpret the world scientifically as it actually is, is later a less natural process is forced upon us, the humanist perception of it is ours by right. The scientific method is intellectually useful but the naive, the anthropomorphic way which humanizes the world and interprets it by analogy with our own bodies and our own wills is still the aesthetic way.

There is a theory believing that the link between the physiological experience and its psychological equivalent is human memory, or experience of the past one interpret unfamiliar materials with his knowledge of old. One transcribes ones self into terms of
architecture and transcribes architecture in terms of one's self because one knows one's own function best. We feel instability, overloading for a structure, and we talk of spirals "soar" and arches "spring", canopies "float", space "flow". We feel the frozen movement, we feel the strength of weakness. We feel the end deflecting tendency of cantilevel, the compression in columns, the weight of mass.

We derive a scale of our own — a human scale. We estimate and measure with our mind the environment before we try to orient ourselves to it. When one failed to measure with this abstract scale, for instance, standing on a narrow street between skyscraper some feel the smallness of ourselves, they sigh that it is inhuman, it is crude. It might impress but not express. Sometimes, we transfer the scale to a familiar object and hence use it as our scale.

Lines on a background can give us feeling of movement. They are seen as possessing spatial qualities. Lines have strength and direction. When we follow a line with our eye the mind passes successively over points in space, this is movement, the movement
is expression, it determines our mood. (Because our own movements are the simplest, the most instinctive, most universal forms of expression that we know) Movement has meaning, so do lines through movements. They have qualities of bold, weak, tense, lax, powerful, flowing---etc. A vertical line awakens a feeling of upward (or downward) direction while a horizontal line, a spread, suggest rest. Points locate line and give its extension. Movement can be pleasant or unpleasant and it will awaken in us an expectancy of further movement. If the stimulation awakens and then falsify, their expectation, our feeling dissatisfied.

Volumes are void or solid. Void is nothing but it is as important as mass. They have boundaries made of planes or curved surfaces. Both have center of gravity. The different locations of the centers of gravity suggest movement, balance, or stability. If it is supported or placed at center of gravity, we feel that it is at rest. When there are more than one volume, the whole is considered as balanced when the sum of movement is zero (the amount of mass of void times the distance of center of gravity to a reference point). The movements are counter-
balanced by each other. Removing a fragment of the whole will destroy the balance. For example, in most Mies Van Der Rohe's it is so delicately balanced say between a column and a wall, a slight shifting of position will destroy the balanced composition.

The proportion of void and mass, the shape, the form, all play important parts in stimulating human feelings. Biological forms and free shapes created through human feelings and structures inspired by nature (biotechnic) are more organic than geometric forms or forms derived from knowledge or science.

Plotinus said, "What is it that impresses you when you look at something that attracts you, captivates you, and fills you with joy? We all agreed that it is the interrelation of parts toward whole and toward one another---that is the beauty in visible things consisting of symmetry and proportion." Seeing a symmetrical volume or staying in it, our feeling reaches out equally in all directions and draws back to the center. It is an unexciting experience. it is a rhythm of equal movement. When parts are put together there should be a focus; a center of climax to which the parts are related, otherwise we will have the feeling of lost or monotony emerge. We
adjust our own gestures to bodies and our mood mostly to space. Space has no boundaries. It is defined in physics as "the relation between the position of bodies (volumes)". Space is "reality" of sensory experience, a biological function of man. All sources which can record the position of bodies can help us to "grasp" space. Moholy-Nagy stated in New Vision that space is perceived through (1) sense of sight, (2) sense of hearing, (3) sense of equilibrium and (4) means of movement.

When we see receding and advancing planes our feeling travels beyond our vision. We feel the space flowing. The interpenetration has been used as the device to integrate the whole space. It stirs the feeling of freedom. As we move what we see changes. If it changes with rhythm, a variety with unity our feeling is satisfied and it is a wonderful feeling of spaciousness. When we see the interior and exterior simultaneously, we see the volume but we feel more than three dimensions. This conscious and unconscious feeling when fused together gives an experience of new dimension.
COLOR

"Every passion and affection of the human mind has its appropriate tint and coloring if properly adapted, --- in the just discrimination and forcible expression of them, it heightens joys, warms love, inflames anger, deepens sadness---". Opie.

Light and colors are definitely associated with a sense organ but we feel the effects in the entire being. The experiences of color, of light, are more than sensory records of the exterior, the objective world. Light and colors are human needs. They give to our life richness, health, and wholesomeness. They reinforce our organic existence, nourish it, and make it more lively. Through the entrance of the inner world, the eye, the message of satisfaction for nerve system is sent from anywhere, everywhere in nature and in this artificial world of material civilization. So, man senses and feels, the former variety of experiences results in countless quality of sensation, the latter on a multitude of affections.

But of what avail is it presented before persons who
do not see when they look? Yet, let us hope alertness might be stimulated by more presentations. "Color-blindness is not a condition existing from birth. It is a misfortune," sigh the artists and the poets, those who paint and who use words as their paint. Because to experience color is to interpret the reality. We see color with the mind's eyes. We are capable to see what actual eyes cannot tell. We see warm and cold, quiet and noisy, irritating or pleasing, clean, dirty, sharp, dull, crude, refine, light, heavy, sad, gay, active, repose, static, dynamic, wild, tame, etc. etc. And complex emotions are aroused, such as pleasantness, agreeability, excitement, tension or their opposites.

But the growth and multiplication of sensation, affection, emotion, association and sentiments, disclose powerful "cross-currents" as the psychologist called it. Human's dual nature is one of the causes. The power of color are given to them by human experience and it extends so wide, so deep into the recesses of individual's memory, belief, customs, and also of group's, nation's or even race's.
Like and dislikes are developed more or less permanent but they also vary temporarily, as moods influence. But many principles and psychological effects are safely applicable to a large group because minor differences between individuals disappear in the averaging process. Each individual's so-called "world of color" overlaps others. They do not coincide but generally have much in common, for instance, human beings have a fundamental preference for pure colors, as the psychological experiments showed. Maybe it is because of the power of the primary lights and its simplicity. Now we have four "parent's color" and six distinctly independent sensations including black and white and besides this the properties of sensations are qualified according to intensity, clearness, vividness, tone, duration and extensity. Now, with borrowed knowledge from books of psychology and my own experience I will try to put into words the feeling toward different colors, especially the powerful pure colors.

Red - The most powerful association of red is blood. So it symbolizes manhood, life, love, energy, power, action, strength, or anger, cruelty and danger.
It is a warm, vigorous, and exciting color, attractive, vivid, and advancing. It reminds us of sunrise, of roses, of flames, it is cheerful. But this cheerfulness decreases as it turns into purple and violet which stimulates suffering and deep thinking.

Reddish browns are associated with harvest which is heavy and rich but not youthful, since it suggests the end.

Yellow - This is the most luminous hue. We relate it to sunlight which is warm, gay, and bright. It is a powerful and glorious color. So in olden days in China, when Emperors were Emperors, it was used to symbolize the "divine right", the dignity. Golden yellow, roof cover, the shelter of that "descendant of heaven". Same are the Russian churches when they had god or gods. The association of yellow with faithfulness and confidence is logical too when we think of autumn gold. In nature they represent maturity. A yellow orange signifies deceit while a shade of greenish yellow is used to clothe various malign passions.

Green - Significance of Nature plays a great part in the interpretation of this color. Especially the
growth of plants in spring, which demonstrates a whole world of greens, symbolizing youth, hope, promise, life and resurrection. Under the shades of woods, there is the perfect example of solitude and peace, quiescent and neutral, a retiring feeling. Even greens connote immortality and lasting memory.

Blue - It is a color of the sky. Human beings are curious of the infinity. So they think, they imagine things are non-existing on earth. So it signifies hope and intelligence and so truth. Man can think better surrounded by blue. In contrast to the solemn main, the immensity, it is cool and tranquil. But when it is too cold, feeling of loneliness emerges.

White - Purity, light, peace, are symbolized. It is a sacred color, a serious cheerful one for the West but a mourning color for the Far East. In the East, white is a synonym of blankness, same as death, the emptiness. White is pure, so pure that it is sensitive to any addition of other colors. It shows delicacy. It is a restful color. Humans can create and imagine more by looking at the non-attractive color.
Black - It is non-existence of light. It is deep and heavy. It is night, and men are afraid. But a dark sky decorated with stars is interesting. It is a good background which will make others shine.

Individual color is not as important as colors put together. Luckoish compared color to music, to plays, he said that harmony is simultaneity and a color scheme is a chord. Throughout nature are to be found gentle chords, beautiful melodies and powerful symphonies. Such music of light and color exhibits a complexity and structure analogous to music. And he also described how color is a play while colors are players. A "star" should be chosen and the supporting cast may require only sufficient attention to avoid competition for favor and lack of harmony.

One color alone stimulates a mood but two together in different proportions will stimulate a different resultant mood which might have some connections with the elemental or it might not. As one observes and analyzes one is puzzled by the complexity of order. The inconsistencies or rather the inconstancies are caused by the so-called "cross-currents" of moods, usage associations and "dual-nature" of humans. As a whole orderliness is still hopeful.
The Appearance - The Illusions

Since our conception of space has changed, this is not as important as it was in the days when Greeks strived to avoid it. And since they are but indirectly borrowed knowledge from the books of psychology, so please find them in Appendix.
TACTILE

Men do not see textures only and do not see forms only, they feel it with their sense of touch.

Theoretical, the sense of touch could be divided into separated sense qualities, such as, temperature, vibration, pressure and rubbing.

By touching we discover the surface treatment, the texture. It is an experience. The roughness, the smoothness, the arrangement of grains, and their proportion, their contrast, their composition, stimulate our feeling. The sense of touch is distributed all over the body though hands and feet have the most chance of contact. When one walks on wooden floors, concrete floor, on mats, on rugs, or from one to the others, the feeling changes too. Soft, warm cold and hard.

When our hands hold the railing, the handle or when we sit the body in a chair, we find that the form fits us or not. When the railing fits well we have the feeling of strength of confidence in it. When
a chair fits our gesture we feel easy. Besides, these, as blind one's can sense, our sense of touch can locate the position of volumes (bodies) register the relation and so, we feel the space.
Human beings, after living in and acting on houses, with the complexity of sensation and feeling, describe buildings by the words cold, warm, lost, attractive, monotonous, clam, restless, soft, hard----, and feel the atmosphere of dignity, dramatic, momental, poetic, gay or sad, worshipful, cozy----etc.
THE EXECUTION

A college, a place where the seeds of culture grow, not a mere image of its society, a puppet on the stage of its age or a lost leaf floating down the stream of the "predominance", following the "trend". Try to see through the disguise, the chao. Penetrate, reflect, absorb and also react and reject, and try to lead. As Lewis Munford said, "Every form of life is marked not merely by adjustment to the environment but by insurgence against the environment it is both creature and creator..."

We know not what the "market demand" is, creature or creator. But I do know the purposes of our educators are to lead us forth to knowledge, to wisdom, through the "channel of enlightenment", to help us to grow, to develop our potentialities, our "biological functions" into a whole "person" an integrated human, to guide us to explore by their crystallized experience in the past, to grant us the right to keep "child's sincerity of emotion", truth of observation and fantasy, and to inspire us to achieve a balance between intellectual and emotional
power. Sayings of the experienced all remind us of the importance of school housing. "The object of the college is not to produce hermits each imprisoned in his intellectual cell, but men, adapted to take their place in the community and live with their fellow workers. The college produces liberality of thought, breadth of view, training of the civic spirit", said President Lowell.

"---Maintain a university spirit of our own and consider our campus a place of homes", President Wilbur.

"---Not one of mere housing but rather one of education and educational influence---the cost to be regarded as an expenditure for necessary educational equipment---", President Butler.

"---All that he really learns in a sense by the active operation of his own intellect and not as the passive recipient of lecture. And for this active operation what he needs most is the continued and intimate contact with his fellows---students must live together, eat together, talk and smoke together, mind really grow", President Lowell.
"The physical conditions under which students live while they are at college or university are fully as important as the intellectual stimuli to which they are exposed. The influence of surroundings may be unconscious but it is nevertheless all pervasive—to build character and to cultivate appreciation of fine human relationship.

The problem is to bind together in sentiment and understanding the entire body—a number of unrelated persons of varying stage to promote scholarship and to produce cultivated resourceful and socialized people.

A dormitory is a laboratory for socialopical experiments. It is a place for spiritual and aesthetic development in addition to mere physical housing.

Personal contact is the shortest way for understanding. Each man's heart is listening to other men's hearts. All will feel the results of the composition conducted in such a fraternal way. The clash of thoughts will sharpen wits. Objects and commodities from widely separated regions were brought together permitting the making of new combination. Strangers
came with new bits of information and unknown beliefs. Old acquaintances meet and talk about things they heard and saw. They communicate their "findings", constant interstimulation, constant interaction, results in social maturity, and collective responsibility. Learn to give and to take. By guidance and association with older students the young ones grow. This is where Democracy can be practiced. "The part is as the whole, no less than the whole is as the part". There should be selfhood not selfishness, liberty not license, taught. A self government, an organic organization instead of super posed government is the best. This is the big family, foundation for citizenship, community welfare and solidarity. This is the place where one can "try the antennae" on the life line of the society they belong. A stepping stone to a bigger world.

It is the duty of colleges to provide material witness of beauty in many forms and to provide for the expression of a wide range of aesthetic experiences. It should sense the value of extra curricular activities and recreation in an well-rounded living
program and should bring them within the scope of an integrated plan. The school can render important guidance not only in the class room but in the standards and facilities which it offers outside the classroom.

A dormitory should provide spaces for living, study, for activities and recreation. There should be privacy for withdrawal, or inactive individual life and atmosphere of family life and then facilities for social life within and outside of the group.
The Problem

The Tech coeds need a new home, a new way of living to spend their hours before and after school. We need a place to crystallize what we are taught in class and a place to find something we cannot find in the school.

This is the Problem

I. A study of the ones to be housed
   A. The student group
      (1) Fields of study
      (2) How the leisure hours are spent
      (3) Geographical distribution
      (4) Financial conditions
      (5) Age range and proportion of graduate to undergraduates.
   B. The Mother
   C. The faculty member
   D. The employee

II. The Accomodation

III. The Climate

Altitude
Temperature Winter
Precipitation Summer

Av. Annual No. of rainy days
Av. Annual No. of cloudy days
Av. Annual No. of shiny days
Av. Annual No. of snowy days
Relative humidity

IV. The Site

A. Location
B. Neighborhood
C. View
D. Topography
E. Communication

V. The administration-government

VI. The Grouping

VII. Spaces required

A. General relations, the evolution of design and apportionment.
B. Student's sleeping, dressing space, studying space.
   (With all recommendations included and discussed)
C. Social space
D. Eating space and food preparation
E. Services
F. Staff accommodation
I. Ones to be housed

A. Students

(1) Fields of study (data obtained from President's report of the four recent years)

<table>
<thead>
<tr>
<th>Field</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>35%</td>
</tr>
<tr>
<td>Architecture</td>
<td>15%</td>
</tr>
<tr>
<td>Math.</td>
<td>10%</td>
</tr>
<tr>
<td>Physics</td>
<td>9%</td>
</tr>
<tr>
<td>Biology</td>
<td>9%</td>
</tr>
<tr>
<td>Electrical Eng.</td>
<td>6%</td>
</tr>
<tr>
<td>Chemical Eng.</td>
<td>5%</td>
</tr>
<tr>
<td>Geology</td>
<td>4%</td>
</tr>
<tr>
<td>Aeronautical Eng.</td>
<td>2%</td>
</tr>
<tr>
<td>General Science</td>
<td>1%</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>1%</td>
</tr>
<tr>
<td>Civil Eng.</td>
<td>1%</td>
</tr>
</tbody>
</table>

This chart shows what is the chosen direction for development. And what are taught in the class, what are the necessary facilitating for the education outside the classrooms to balance, to compensate, and to enrich.

2. How the leisure hours are spent. (Data from the check out book in the present house for 2½ years)
Movies and radio are the most popular. It is a sign that the interest in human has not been lost. The fondness of parties shows that they need space for social activities. Sports are neglected which is not a healthy phenomena.


<table>
<thead>
<tr>
<th>Location</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass.</td>
<td>48%</td>
</tr>
<tr>
<td>New York</td>
<td>15%</td>
</tr>
<tr>
<td>New Jersey</td>
<td>5%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>4.5%</td>
</tr>
<tr>
<td>Ohio</td>
<td>3%</td>
</tr>
</tbody>
</table>
Maryland 2%
Connecticut 2%
Louisiana 2%
Other States 1% for each
Foreigners 5.5%

The majority are from the vicinity, the eastern and northern part and a large number of them have their homes here in Boston or Cambridge.

There are almost one half of the students that are self supported or partially independent. But since they are special students who only take one course and work outside of school, they will not live in the dormitory. The rest that are taking normal loads are supported by their family or are on scholarship, or they work during vacations. The monthly allowances range from one hundred to two hundred with an average of one hundred thirty including the eighty for room and board now. (3% of eighty is the profit,) and 6% is the social fee for house parties and another 3% returned for the work (cleaning, serving, etc.) done by students.

5. Age distribution and proportion of graduates to undergraduates.
The age ranges from 16 to 30 with a medium of 22. Some of the graduates are younger than undergraduates in age. The numbers of graduates and undergraduates are almost the same. Last term comes out to be equal.

B. The Mother.

It is the tradition that when girls live together they need a chaperon to guide them to protect them. She is an adviser to all. Now we have one adviser to sixteen of us. While other schools B. U. etc. have an average of one to thirty. She is also the housekeeper. She has a private life so she needs more than a bedroom. A suite should be provided.

C. Faculty Member.

Existing housing as Harvard has a master's house adjoining to each unit, and propose dormitory as Smith's has faculty's suite, in addition to house mother's. I think that it is desirable to have faculty member with his or her family live with students when the location of dormitory is far away from school. So that the relationship and understanding between teacher and students will be developed by daily contact. Teachers teach students to learn and stimulate their thinking in class. Why shouldn't they guide their activities and ways of living outside
of the classroom. This is the only way teachers can know what the students really need. In the class, the relation is a teacher to a group of students and here the teacher can find students as individuals. It could be young or old couples, one or two little kids are lovely addition to the scene. They will remind the ones away from home their parents, their childhood or their young brother and sisters.

D. Employee
Not much help except cooking is needed in most girls' dormitory. The problem will be much simpler with only one or two employee to be housed. Because great care should be taken in the choice of kinds of persons, their private life and behavior. They have a right to live decently. So their living space should not be a cell in the basement. Equality should be the spirit.
II. A Study of the Size or Accommodation

To live in groups is a pleasure only when the atmosphere of home is well preserved. Though the operation and administration cost favors large units the size should be determined by the special needs of the group to be housed both social and educational needs. As it mounts in numbers the "family" pattern of relationship fades and the institutional pattern emerges.

Most of the students here in the dormitories have the experience of living away from home for six to eight years since high school ages. Human life cannot afford to spend many eight years in un-homely atmosphere. In a large group, few can understand each other, few cares and loves. Small units give emphasis to the individuals. They foster intimate association among the members and make for unity and loyalty within the group. The attitude and experiences of each student have significance for all of her associates.

But in large groups individuals are more free to choose their associates. And the "off-type" student who may be somewhat of a misfit in a small unit is
almost certain to find congenial spirit in a larger group.

Small social groups within the large unit form and reform, shifting in membership from time to time and enable individuals to develop new interests and associates. When the Institution pattern is marked people are thrown more definitely upon their own resources as they are in a hotel and both the satisfaction and limitations of small units are gone. Individuals tend to become lost.

The following is a collection of data of the capacity of existing housing units for women in this country.

<table>
<thead>
<tr>
<th>College</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornell</td>
<td>80</td>
</tr>
<tr>
<td>Illinois</td>
<td>140</td>
</tr>
<tr>
<td>Michigan</td>
<td>118</td>
</tr>
<tr>
<td>New Jersey</td>
<td>25, 50, 18, 17</td>
</tr>
<tr>
<td>Radcliff</td>
<td>75</td>
</tr>
<tr>
<td>Smith</td>
<td>60</td>
</tr>
<tr>
<td>Wellesley</td>
<td>166, 130</td>
</tr>
</tbody>
</table>

The Institution's Economics Section of the American House Economics Association recommended 50 as a limit for social group.
Harriet Fayes directed a study of 473 women's Hall in 124 colleges and found the capacities range from 6 to 450 with a medium of 59 in 55% of these halls.

With the recommendation of the adviser to women student and a careful study of growth of student body, the geographical distribution and the opinion of the coeds the size is decided to be thirty.

III. The Climate:

<table>
<thead>
<tr>
<th>Altitude</th>
<th>125'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature type</td>
<td>Cold winter - hot - summer</td>
</tr>
<tr>
<td>Mean Annual Temp.</td>
<td>49°F</td>
</tr>
<tr>
<td>Annual range of monthly mean</td>
<td>43°F</td>
</tr>
<tr>
<td>Monthly mean of daily range</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>17°F June</td>
</tr>
<tr>
<td>Minimum</td>
<td>15°F Nov.</td>
</tr>
<tr>
<td>Yearly precipitation</td>
<td>40 in.</td>
</tr>
<tr>
<td>Monthly maximum</td>
<td>3.7 in Feb.</td>
</tr>
<tr>
<td>Monthly minimum</td>
<td>2.9 in June</td>
</tr>
<tr>
<td>Annual no. of rainy days</td>
<td>117</td>
</tr>
<tr>
<td>Annual no. of cloudy days</td>
<td>130</td>
</tr>
<tr>
<td>Proportion of possible sunshine</td>
<td>59%</td>
</tr>
<tr>
<td>Mean annual rel. humidity at noon</td>
<td>61%</td>
</tr>
<tr>
<td>Winter conditions</td>
<td></td>
</tr>
<tr>
<td>Days in Frost season</td>
<td>166</td>
</tr>
<tr>
<td>Parameter</td>
<td>Value</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Av. Annual min. temp.</td>
<td>40°</td>
</tr>
<tr>
<td>Av. Annual snowfall</td>
<td>40&quot;</td>
</tr>
<tr>
<td>Days with snow cover</td>
<td>120</td>
</tr>
<tr>
<td>Prevailing wind direction</td>
<td>W</td>
</tr>
<tr>
<td>Av. mean rel. humidity at noon</td>
<td>63%</td>
</tr>
</tbody>
</table>

**Summer conditions**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Av. annual maximum temp.</td>
<td>96°</td>
</tr>
<tr>
<td>Prevailing wind direction</td>
<td>SW</td>
</tr>
<tr>
<td>Av. mean rel. humidity at noon</td>
<td>61%</td>
</tr>
</tbody>
</table>

The climate indicates same-outdoor space for the months from end of October to end of April is necessary. Cross ventilation is important for the damp hot summer.

**IV. The Site.**

Two were chosen, one in the country and one in the city to compare the different ways of living. When I first thought of the site I hoped to locate it near a girl's college of liberal arts, since this is a dormitory for Tech. But no site which is near to both schools.

I draw a circle around the Institute and I found that it is better to go North to avoid crossing the heart of Boston.
The country site is a tiny peninsula on Mystic Lake. It is the right site for thirty girls to call it their "own." A bridge connects it to the main land on the West. The lake is embraced on two sides by a range of rocky hills. At the foot of the hill a highway leads to town (a bus line runs to Arlington and then Harvard Square). Aged woods are the present inhabitants on the island. They seem to drop blessings to the passer-by. Several places on the ground rocks poke out their heads, whispering words of welcome. The neighborhood (on the main land) is residential district with clubs scattered among them. It took only 20 minutes to drive in to school even via Memorial Drive (in order to avoid the heavy traffic on Mass. Avenue). This site was chosen in hoping that blended with the poetry exhaled from the earth, the whispering of breeze, the ever-changing cosmic rhythm, the song of birds, cries of animals, the clean horizon, the greenery, all these companions by birth, we will be able to grow. The ones who see not will be able to see again. To seek for a state of rest, to crystalize what we were taught in the day.

The city site is in the shadow of Tech. (It is one of the site proposed for dormitories) located on
Memorial Drive, a parkway facing Charles River, looking toward old Boston. It is going to be surrounded by play-field, and dormitories. As it is a town site, its environments are ugly, but is more convenient as far as transportation is concerned because it will take only ten minutes of walk to go to school, and it can share most of the facilities in school.

V. The Administration.

After an observation of the existing condition of fraternity houses and cooperative houses in contrast to the dormitory of the existing girls dormitories, I found the former one more healthy because self-governments are practiced. Individuals cannot be left free to develop according to their many natural inclination because there is no evidence that their unlearned tendencies are right. Social control of individual behavior becomes imperative. The task is how to secure a compromise between chaotic individualism and regimented collectivism.

It is undeniable an organic government growing out rather than forced on or superposed will be more successful. "That government is best government, that is least government." Jefferson. The advisers should be adviser only, not ruler.
VI. The Grouping

Should graduates and undergraduates be housed under the same roof? The graduate students are more mature, & independent than the undergraduates. They deserve more freedom. Students do not instantly mature from adolescents to adults upon arrival at college. There is a difficult period of transition. Almost every newcomer, young and inexperienced is emotionally or socially maladjusted to some degree. The serious cases are inferiority complex, superiority, complex, chronic worrying, extreme shyness, egocentricism, lack of morale. All are due to the unfamiliarity to the new associates, new environment. Guidance and supervision over the younger ones by the older ones.

In their studies and activities are desirable at the same time the younger ones are more alive. They have stronger interest in school life while the graduates only have memories of their college life. When put together the group life will be more active.
Advantages and disadvantages of double room, single room.

Double - Advantages
They possess the practical advantage of a saving in space and expense per student house. They are also conducive to a type of companionship and social training that may sometimes prove invaluable in the social discipline and personal development of individuals.

The demand for consideration and courtesy in daily living together provides a training that is often needed by individualistic young ones particularly those who have been overindulged at home.

Disadvantages
It is in the occasional sacrifice of amiable individuals for the benefit of badly adjusted fellow students that one of the most valid objection to double room is found.

Two persons are forced at every turn to consider each other's preferences and idiosyncrasies as well as actual needs. Persons of yielding dispositions are likely to be dominated by more forceful room mates often to the detriment of both. There are always some students who should not room with others because of poor health
emotional instability, more independent students and those carrying heavy programs. Besides this emotionally exaggerated relationship, jealousy and similar difficulties must be reckoned with.

Single Room - Advantage
It provides privacy and freedom to individual.
Disadvantage
Some unsociable students might spend all their college life in their private cell, isolated from the group. Rooms for more than three are considered undesirable.
## VII. SPACE REQUIREMENT

**Apportionment of Space in Existing Dormitories for Women**

*(Based on Data by Klander and Wise)*

<table>
<thead>
<tr>
<th>Halls</th>
<th>Student Rooms Including Dressing Accomodation</th>
<th>Social Service</th>
<th>House Service</th>
<th>Personal Service</th>
<th>Food Service</th>
<th>Living Accom. for Staff Employees and Guests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q. and R. (Cap 65)</td>
<td>83.46%</td>
<td>11.35%</td>
<td>1.35%</td>
<td>.85%</td>
<td></td>
<td>2.99%</td>
</tr>
<tr>
<td>Connelly Hall</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Rosemont College (Cap 70)</td>
<td></td>
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<tr>
<td>Worth Hall</td>
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</tr>
<tr>
<td>Swarthmore College (Cap 70)</td>
<td>71.41</td>
<td>13.24</td>
<td>3.37</td>
<td>1.87</td>
<td></td>
<td>4.70</td>
</tr>
<tr>
<td>West Resid. Hall</td>
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<tr>
<td>Univ. of Illinois</td>
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<tr>
<td>Harwood Court</td>
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<tr>
<td>Pomona College (Cap 185)</td>
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<tr>
<td>New Dorm.</td>
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<tr>
<td>Elmira College (Cap 111)</td>
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</tr>
<tr>
<td>Q. and R. (Cap 65)</td>
<td>85.02</td>
<td>9.61</td>
<td>1.25</td>
<td>.71</td>
<td></td>
<td>3.41</td>
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<tr>
<td>Connelly Hall</td>
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<tr>
<td>Rosemont College (Cap 70)</td>
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<td>Elmira College (Cap 111)</td>
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<tr>
<td>Q. and R. (Cap 65)</td>
<td>84.83</td>
<td>11.05</td>
<td>1.33</td>
<td>.90</td>
<td></td>
<td>1.89</td>
</tr>
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<tr>
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<td>New Dorm.</td>
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<td>Elmira College (Cap 111)</td>
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<tr>
<td>Q. and R. (Cap 65)</td>
<td>75.56</td>
<td>8.41</td>
<td>2.41</td>
<td>1.47</td>
<td></td>
<td>11.06</td>
</tr>
<tr>
<td>Halls</td>
<td>Student Rooms Including Dressing Accom.</td>
<td>Social Service</td>
<td>House Personal</td>
<td>Service Personal</td>
<td>Food Service</td>
<td>Living Accom. for Staff Employees and Guests</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------------------------------------</td>
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<td>------------------</td>
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<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Hendrix Halls</td>
<td>90.68%</td>
<td>6.64%</td>
<td></td>
<td></td>
<td></td>
<td>2.48%</td>
</tr>
<tr>
<td>Univ. of Oregon</td>
<td>(Cap 60)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Martha Cook Hall</td>
<td>65.78</td>
<td>7.74</td>
<td>4.83</td>
<td>2.18</td>
<td>13.96</td>
<td>5.46</td>
</tr>
<tr>
<td>Univ. of Michigan</td>
<td>(Cap 118)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Smith Halls</td>
<td>62.20</td>
<td>11.82</td>
<td>1.51</td>
<td>1.11</td>
<td>10.60</td>
<td>12.70</td>
</tr>
<tr>
<td>Roble Hall</td>
<td>67.57</td>
<td>8.32</td>
<td>3.43</td>
<td>2.57</td>
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<td>Stanford Univ.</td>
<td>(Cap 154)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average for all Halls without</td>
<td>83.</td>
<td>9.39</td>
<td>1.72</td>
<td>1.23</td>
<td>3.95</td>
<td></td>
</tr>
<tr>
<td>Food Service</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average for all Halls with Food</td>
<td>65.18</td>
<td>9.29</td>
<td>3.27</td>
<td>1.95</td>
<td>11.30</td>
<td>8.73</td>
</tr>
<tr>
<td>Service</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

A study of the above table shows that the social element is neglected. Most of them still consider a dormitory is a place of sleeping and studying only. It is a surprise to see that so many dormitories do not provide food service, the cause of which is to avoid the complicated management.
A. General Space Division
(1) Students' Space
  Sleeping
  Dressing
  Studying
  Bath, Lav., toilets

(II) Social
  Formal for reception and large gathering
  informal - for lounging and recreation, for
  callers, private space.
  Dining - for house only
    - for guests
  Guest's room with facilities.

(III) Services
  Kitchen
  Pantry
  Dishwash
  Storage refrigeration
  Laundry
  House Services
    Post Office administration office.
    Storage for trunk
    Telephone and communication system
    Linen closet
    Boiler Room

(IV.) Accommodation for Staff and employees
  Sleeping Space
  Living Space
The development of relationship
The Evolution of Planning.
We examine the plans of the old and the new. We can see the changes.

Antique (Saving of space?)

Totality (180 per floor) (U. of Michigan)
Cornell - Boldt Hall

The group is divided up by five walls and related together by a common staircase a common toilet.

Yale - Harkness

In addition to staircase and toilet a study common to both which serves as a link between two individual—a social chance.

Colby College

Wings connected by service (special kit)
Dormitory for California University

Bed study unit is balanced by social space to which the service unit is connected.
STUDENT'S PRIVATE SPACE

There are several types of students' rooms. The data obtained from the survey made by Harold R. Sleeper is as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Students</th>
<th>Square Feet of Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>a. Single study bedroom</td>
<td>1</td>
<td>180</td>
</tr>
<tr>
<td>b. Double study bedroom</td>
<td>2</td>
<td>250</td>
</tr>
<tr>
<td>c. Triple study bedroom</td>
<td>3</td>
<td>Seldom used</td>
</tr>
<tr>
<td>d. Bedroom and study</td>
<td>1 S 1 B</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>e. Bedroom and study</td>
<td>2 S 2 B</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>160</td>
</tr>
<tr>
<td>f. 2 Bedrooms and 1 study</td>
<td>2 S 2 B</td>
<td>Same as (d)</td>
</tr>
<tr>
<td>g. 3 Bedrooms and 1 study</td>
<td>3 S 3 B</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Same as (d)</td>
</tr>
<tr>
<td>h. 1 Bedroom and 2 studies</td>
<td>2 S 2 B</td>
<td>Same as (d)</td>
</tr>
</tbody>
</table>
Student's Room

Single -
Approximately 40' of space is required for mere placement of furniture, based on the following usual dimensions, bed 3 X 6½, dresser, 1½ X 3, desk, 2 X 3 bookcase, 3/4 X 3' chair, 1½ X 1½' easy chair 2 X 2.
Provision for arrangement and use of these articles requires a total space allowance of at least 80'.
Additional provision for marginal and "living" space set a total single room standard of 120' with 140-180 as desirable.
Width of single room should not be less than 8', 9, or 10 preferable.

Double
Two hundred sq. ft. of clear space minimum, more where possible. Twelve foot minimum width is desirable to provide each student with his own bed, dresser, desk, study and easy chairs, suitably arranged in relation to convenience comfort and light.

Closet
Space should not be taken off room area. Closets should be for individual use, with 32" X 40" min. All closets should be ventilated, shelves for hats, racks for shoes, rods high enough for evening dresses.
Bookshelves -
Twelve feet of bookshelf space is required for graduate students, 6' for undergraduates. Built in type recommended.

Bath and Toilet Facilities.
Lavatories should be included in individual rooms for women. Common bath and toilet rooms. Currently acceptable ratios of fixtures to users are as follows:
1 toilet to 5 - 6
1 shower to 6 - 7
1 basin to 3 - 4 (Where lav. are included in individual rooms 1 or 2 basins in common area are sufficient.

C. Social Space
It is recommended that it should be more elaborate in women's dormitories than men's.
A study of the social rooms in 25 women's dormitories made by Grace M. Augustine showed that the number of such rooms in these halls varied from one to seventeen and that the average number was 3.4 rooms. Only seven of the twenty-five halls provided but one room, nine provided two. Two thirds of all the social rooms were one main floor. Most of those on upper floors were used as lounge. The average amount of social space per
student was 24.7 feet. The dormitories studied by Augustine were scattered through the country and their capacity ranged from 8 to 320 students. Institution Economics Association recommends for women's hall one main living room on the main floor accessible to main entrance with a minimum allowance of 22 feet per student housed and in addition one or two small rooms for each unit of 40 students.

Hugh Stubbins in his "What do Colleges really want" and Hayes in his "Planning Residence Halls" recommended the space for social life, should provide the following:

1. Social and recreational life among resident students during leisure time periods, such as late afternoon and early evening hours and over week-ends. Such facilities as common rooms, game rooms, libraries and lounging room upstairs are the usual means.

2. Callers of individuals. Privacy is desirable. A secluded area for private conference should be available.

3. The reception and entertainment of small groups.

4. Larger social functions in which most or all of the members of the house unit, together with their guests must be accommodated. Receptions, musicals, dances, and similar social occasions are included here. Planned for removal and temporary storage of furniture during dances.
Recreation or game room providing for ping-pong etc. Avoid locate it in basement.

D. Eating Space and food preparation space.
What type of food service should be maintained? Who is to be served? When? Cafeterias have come into common use. Food can be provided quickly at moderate cost. It is more flexible when the kinds of food and time of service are concerned. But since cafeteria encourage the violation of most of the social and hygienic rules that govern proper food service, they are not regarded with favor by those who believe that for college students the taking of food should be something more than a rapid eating of merely what one fancies at the moment or thinks he can afford. They permit the selection of food on a hasty and haphazard basis, the service is noisy and nervewracking and they encourage rapid, carless eating habits. Services by waiters is generally preferred. To eat at the same time, same food enables the college to offer balanced food and give more chance for social. And it is more home-like.

The space required for dining is 12-15 ft per seat.
Acoustical wall and ceiling surfaces constitute the best insurance against noise but the provision of a liberal amount of space per person will be of much assistance in this connection. Generous ceiling height will also help in reducing noise and nervous tension.

Service area and food preparation.
As to the service the girls take turns waiting on the table and washing the dishes. Two cooks are employed in this dormitory.

The delivery of supplies should be direct, avoid steps. The entrance should be separated from the main doorways at least 4' 8", corridors at least 6'. The storage space of food has been changed since new food processes, such as deep freezing and dehydration are now in common use.

In the kitchen cross ventilation is necessary. Space for preparation and cooking should be separated, but well connected.

As to garbage disposal incinerator is recommended in many places. The kitchen space is about 1/3 of dining.

E. Services
Laundries and pressing space are provided in most of the women's dormitories.
1 tub for 25 occupants.

1 pressing board to 20 - 25 are recommended in time saver standards.

Telephone - the most satisfactory arrangement is a two-way buzzer system.

Mail office near the entrance.

Trunk storage space allowing 45 ft³ per trunk.

Freight Elevator required even in three story building.

F. Accommodation for Staff

Sleeping and living space for help.

Suite for house mother.
A COUNTRY HOUSE

The first flash of thought came to my mind, when I was trying to seek the integration of life, is to return to nature. The country site is a peninsula which has beautiful view of the lake to the South, West and North directions. Wishing to enjoy this gift of nature to the fullest extent, I have decided that the best distance between two points shall not be a straight line. When away from the crowded city, away from the mass, human beings are more dependent, so I divided up the group into families of six. Each has a small lounge (the space is contributed by each individual bed-study room).

These units are connected and centralized to a main social, dining, recreation space. I spread out the units to the earth and sun with trees as sheltering. But suddenly I feel that the younger ones may feel lost so I took two units of young ones back and put it on a summit where the housemother and the faculty family can keep guide. I remember that it is human instinct from the beginning of the civilization to build house under the shade of trees. But the social center is too high, too big to be sheltered by any trees. So I tried to work out an "ivy house" to envelope the actual house. When one raise her head she can see through the ivy and see the sky, the sun, the moon......just like on standing under a tree and looks up.
The life in the country is more informal. Many outdoor sports can be enjoyed as fishing, boating and swimming. There are quite a number of clubs on the main land. Therefore, overnight and over week-end guests are expected. The number of guest room are increased.

In the city there is only one view, looking over Charles River. To the East there are red brick fraternity houses and apartments. To the West, advertisement and signs, to the North Cambridge's industrial area. I decided to close up from the ugly external and create an interior surrounding.

In Cambridge due to the weather almost half of the year all activities have to be Indoors. And flowers can not grow out of door. In the present all green houses are used, commercially and functionally. Its beauty has been ignored. I put a green house at the center with bridges penetrating it to tie up all parts. So no weather where one goes one has to pass through this green belt and the mind is filtered.

In order to get necessary good view and orientation for some space as living, dining, studying. I split up the area required for sleeping, dressing and studying. In design of residences one seldom would mix up sleeping, dressing and studying. So it should be the same in the dormitories because the requirements are different for space of the different functions.
The city site is on Memorial Drive. The girls can come home for their lunch. In addition to this they may invite friends. So the dining and food-service space is more than minimum requirements for thirty.
(Please compare this table with the table of existing housing)

<table>
<thead>
<tr>
<th>%</th>
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<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td>16%</td>
<td>16%</td>
<td>19%</td>
<td>10%</td>
<td>33%</td>
</tr>
<tr>
<td>21%</td>
<td>5%</td>
<td>26%</td>
<td>30%</td>
<td>6%</td>
<td>27%</td>
</tr>
</tbody>
</table>

City
Country
House
Accommodation
Guest for Short & Long Stay
Services
Study
Dresser & Mirror
Dining
Recreation
Living
House

(Appartmentment of Space)
THE END.

The City Home is Chosen as the Final Solution because of the Serious Problem of Transportation.
Optical illusions of lines, planes and bodies.
Owing to the absence of any definite measuring
device which will span the gap between perception
and objective reality, error of judgement exist.

Lines, areas and masses are not perceived in
their actual physical relations. The appearance
of a colored object varies considerably with its
environment. A bright object appears larger than
a dark object of the same physical dimension. Flat
areas may appear to have a dimension of depth.

The connection between the material and mental
in vision is incomprehensible. If we trace the
process we find that objects emit or reflect light
and the optical mechanism known as the eye focuses
image of the objects upon the retina. Messages
are then carried to the brain, where certain
molecular vibrations take place. There appears
consciousness, sensation, thoughts, desire and
volitions. But how and why --- no one knows yet.
The senses may deliver correctly but errors may arise from imagination, false assumption, incorrect association, and the recovery, frequency and vividness of past experiences.

Mathew Luckiesh said --- "the gift of sight are augmented by the mind with judgements based upon experience with these gifts."

Anyhow the direct data delivered by the visual sense are light, intensity, color, direction.

Illusion classified. (Figures from "Visual Illusion and their application"

1) Effect of the location in the visual field.

More effort is required to raise the eyes or point of sight through a certain vertical distance than through an equal horizontal distance.

Vertical lines appear longer than the horizontal.

A perfect square appears too high.
(2) Illusion of interrupted extent.

Distance and area appear to vary in extent depending upon whether they are filled or empty or are partially filled.

\begin{center}
\begin{tabular}{ccc}
a & b & c \\
\end{tabular}
\end{center}

a, c, appear shorter than b.

\begin{center}
\begin{tabular}{cc}
a & b \\
\hline
\end{tabular}
\end{center}

Blank space appears shorter.

\begin{center}
\begin{tabular}{cc}
a & b \\
\end{tabular}
\end{center}

a appears longer than b.
(3) Illusion of Contour

\[ \text{Flutter} \]

\[
\begin{array}{c}
\text{b} \\
\text{a} \\
\text{c}
\end{array}
\]

a Appears to be narrower than b, c.

(4) Illusion of Contrast.

Parts adjacent to large extents appear smaller and those adjacent to small extents appear larger.

(5) Illusion of Perspective

Right angle appears to be oblique.

Oblique appears to be right
(6) Double interpretation – fluctuation of attention.
   -- the shape and the background interchanging.

(7) Illusion of depth and distance.
   Judgement by color – the nearer color is more vivid due to the depth of air.
   Judgement by size – we judge unknown size by estimated distance and unknown distance by estimated size.

(8) Irradiation and Brightness – Contrast dark and bright when juxtaposed mutually reinforce each other. Light source appears larger. A bright object appears larger than a dark object of the same size, and at the same distance.

The psychological hypothesis introduce such factors as attention, imagination, judgement, and will, as cause of illusion. Hering and Helmholtz claim that the kind of inversion which occurs is largely a matter of chance or of volition. Some hold that the perception of perspective figures is influenced
by imagination or the images of memory. Helmholtz stated that "glaring at an object we observe spontaneously one or the other form of perspective and usually the one that is associated in our memory with the greatest number of images." The physiological hypothesis depend largely upon eye-movement and accommodation.

Illusion of color and light.

(1) Simultaneous Contrasts - If a room is illuminated by deep red light at first this color is very vivid in consciousness; however gradually it becomes less saturated. After half an hour the color is appearing a much faded red but upon emerging from the room into one normally lighted, the latter appears very markedly greenish in tint. The reason that the pure red light does not appear as strongly colored as if really it is due to the lack of contrast. The effect of contrast is always in the direction of still greater contrast. That is black tends to make it surround white, red tends to make it surround blue-green.
The contrast effect is greatest when the two surfaces are juxtaposed and the elimination of boundary lines of other colors increases its magnitude. The contrast effect of colors is most conspicuous when there is no brightness contrast, that is, when the two surfaces are of equal brightness and therefore differ chiefly in hue. This effect is greatest also for saturated colors.

(2) After image.

After looking at bright objects we see after images of the same size and form which vary more of less in color. This after images are due to persistance or fatigue of the visual process, depending upon conditions. At first is due to a persistance of the usual process but as it decays it continously changes color and finally its presence is due to fatigue. After-image may be seen after looking intently at any object and then directing the eyes toward a blank surface. When these after images are projected upon other objects, it is obvious that the appearance of the latter is apparently altered. Positive and negative images are complementary in color.
(3) Growth and Decay of Sensation
The persistence of vision, the rates of growth and decay are different for different colors. It appears that blue-sensation rises very rapidly and greatly "over-shoots", its final steady value for a given stimulus. Red ranks next and then green. The "over-shooting" appears to be greater for the greater intensity of stimulus. The time required for the sensation to reach a steady value depends both upon the spectral character and the brightness of the color.

(4) Retiring and advancing color.
In general, the colors whose dominant hues are of short wave-length (violet, blue, blue-green) are retiring and those whose dominant hues are of the longer wave-length (yellow, orange, red) are advancing.

(5) Visual Adaptation
It was stated that all sensation of light tend toward a middle grey and all sensation of color tend toward neutrality.

(6) Cold and Warm Colors
Cold colors produce stronger contrast effect than warm ones.
DORMITORY FOR N.Y. GIRLS
a humanized machine to house the machinized human