PERPETUAL MOTION

AN ARCHITECTURAL COMEDY

by Christopher Rayman

with
Arthur Scholler
John McCready (architectural critic)
Elizabeth Glenn (anthropology critic)

LEADER
SWINDLER
PARANOID
SYMPATHETIC
STORYTELLER
LONER
ROMANTIC
LOVER
ENTREPRENEUR
CHEATER

And so the story begins.
I would like to thank the following people for their help in making this thesis possible:

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the world
THE PROPOSAL
THESIS PROPOSAL
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THESIS COMMITTEE
Art Schaller, department of architecture
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"Very soon from now a group of friends, perhaps ten, will break themselves away from their regular activities in their lives and travel to a secluded place in order to explore a passion that burns within all of them. They will choose to seclude themselves for independence, self-reliance, and to escape the social pressures that will prevent them from full examination of their mutual obsession. Their passion is to create a machine that has been proven impossible to built, and the subject of my thesis is to chronicle their investigation of this impossible machine, the perpetual motion machine."

Of course, this idea is a work of fiction, however, it is my intention to explore architecturally both the myth of perpetual motion as it can be captured in built form as a hypothetical working model that seems to defy the laws of science, and the issue of a small group of people working together to create something that has been proven again and again to be absolutely impossible.

My primary interest in relation to the idea of perpetual motion is its absolute impossibility as a feasible scientific creation; its very notion defies all laws of physical motion, yet simultaneously, seems to reaffirm them. Also, as a theory it has existed for centuries and has led to the madness and suicides of several gifted scientific minds, as well as the downfall of large fortunes, and the embarrassment of entire governments through its obsession. With recent technological developments in the area of frictionless superconducting electrical circuits, it seems time to begin new investigation into this area since its prime source of its demise is based on the control of friction over the movement of objects across surfaces and through space.

Also of great interest to me is the development of a society that apparently has no purpose except a driving passion towards a seemingly unattainable goal. Of course it could be argued that our society today is approaching this very idea, and it is my intent to draw those parallels, however it is of greater importance to me to explore the idea in a more spatial sense, dealing with the communal implications that arise out of a small group that is isolated from the whole of society. It will also be important for me to examine the architectural issues that arise since I intend for this group of friends to actually live adjacent to and actually within the object that is created as they are building it. It is also my intention that the object is to be left as a "perpetual motion building", or a piece of "living, breathing architecture" that is a self-sufficient entity proving by its very nature that it can withstand time to achieve an immortality.

Fundamentally, my main objectives in this thesis are the investigation of the limits of architecture and the many roles that it has come to play in our lives both daily and in its definition of our experiences making up our lives. That, of course, is not my only objective since what I have just stated requires that architecture be more than just experience in order for it to become definition. Other objectives of my thesis are to attain a greater understanding of nature and man's role in the control of the environment, as well as a deeper exploration of the way that man lives with others under different circumstances, and the natural, almost biological growth of a culture from a community and a certain way of life.

First, by the idea of perpetual motion, it is required that I become more acquainted with the science of nature and the functions that make it a constant inspiration to us.
By designing with nature and as an extension of it, I intend to create a model that is representative of man's role on the earth as an alchemist of sorts, creating chemical change within the limits of the natural laws that surround and control him and his environment (I use the term alchemist to describe how man has successfully adapted materials to fit his needs and then adapted the adapted materials in order to meet how his needs have changed as a result of the material's changing role). I believe that man has done great things at the expense of the deterioration of his environment, and only now is this awareness arising, however it is evident that for centuries man has also done great things in working with his environment as a product of and dweller within it. It is for this reason that I wish to create a natural machine that allows man to survive without the destruction of what exists around him.

Following, my goal of greater understanding of those around me is and should be of great importance to all of us if we wish to remain in a free and peaceful world. At the root of this understanding for me is the connection that I must maintain to the earth and my presence upon it since it the binding thread that connects every person on the planet. Especially in the topic that I have chosen, as I have explained above, this idea must remain paramount. Initially, I would like to examine the natural growth of an architectural product that is derived from a very precise and explicit way of living. This exploration is intended to produce an architecture indicative of that way of life and is, in a sense, a part of it.

Since the way of life that I refer to in this thesis is one of natural, mechanical, scientific, and architectonic pursuit, that product, it is believed, will be one where, as Morwan Al Sayed sais concerning the work of Walter Pichler, "... it is a place where architectonic, natural, mechanical, and anatomical, systems become one." Also, since the natural growth of the community is selected as a prime area of concern for study, it follows that the program is to be treated as a rough framework in which to design.
The site in which the group has chosen to build their obsession is located in a remote area of Southern Indiana and is situated within the property of an abandoned farm complex which was inherited by one of the group's members. Included on the site are a series of vacant buildings, a small woods, several fields, and a strip of land adjacent to Interstate 65. More information concerning the site is included in the context analysis.

I. A Perpetual Motion Machine
   A. It is required that the architecture exhibit the characteristics of a machine that produces more energy than is used in the production of that energy.
   B. It is required that the architecture exhibit the above characteristics for as long as the materials used in construction allow the production of energy to continue or forever, whichever comes first.
   C. It is required that, due to economy, the following requirements of the program be incorporated in whatever means possible to participate in the requirements stated above.

II. Living Requirements For Up To Ten People. Each Person Requiring:
   A. A room in which to sleep.
   B. A room in which to prepare, consume, and store food.
   C. A room in which to bathe and perform basic human functions involving the removal of waste from the body.
   D. A room in which to greet guests, be at leisure, or perform whatever needs as decided by the group to be necessary for the complete fulfillment of life.
   E. The systematic and structural requirements as needed to function properly as a living space and in requirement of needs stated in I.

III. Public Areas For Group Interaction Or Dispersal
   A. A room in which to meet to discuss ideas, debate ideas, perform music or drama, display works of art, compete sportingly, or perform whatever needs as decided by the group to be necessary for the complete fulfillment of life.
   B. A room in which a single person might be alone for the contemplation of nature, God(s), or themselves.
   C. A room in which to store the tools used in the building of the perpetual motion machine.
   D. A room in which to conduct experiments, build models or works of art, and to store the knowledge that is accumulated over the course of construction.
   E. A room in which to store the tools used in the growth and harvest of food eaten by the group.
   F. A memorial space to the continuation of the project that is reflective of the circumstances in which they work.
By way of precedents I have selected a variety sources which have given me inspiration towards the ideas represented here. Some of the issues and ideas investigated have precedents of their own such as the design/build of an architectural idea, developments in natural systems, new and historic communities basing themselves on natural or communal living ideals, cultures that have existed where certain parts of society were based on the completion of one specific task of building, cultures whose religious structure is based on nature, and the completion of hypothetical models believed to exhibit the scientific theory of perpetual motion as well as models using seemingly impossible means to achieve fantastic results.

In my investigation of the design/build approach to an architectural idea, I include the work of Walter Pichler, an Austrian architect/artist who chose to live in solitude in rural Austria and designed and built all of his tools for farming as well as his built environment. Also included under this issue is the Chilean community of Ciudad Abierta, where new uses of natural systems have been discovered by a group of architects and designers living in a communal environment where all decisions are made by unanimous vote.

The work at Ciudad Abierta is also important in the area of natural or poetic living as the basis for a community. New communities with very fixed or utopian philosophical or religious ideals, such as the Shakers, Robert Owen's New Harmony, or Brigham Young's Salt Lake City, fall into this category of investigation. American Indian cultures which have such a strong basis in nature will also be of significant importance. Also of interest to me are such cultures as the Babylonians, Egyptians, and the Mound Building nations, such as the Adena, whose passion for specific building ventures created such a powerful influence on the whole of their society.

Of most specific importance architecturally are the mechanical representations through history of machines defying our known laws of science. Perpetual motion machines will, of course, be important to my investigation but new forms of complex scientific models will also play an important role in the study. Similarly, I include the work of French novelist and playwright Raymond Roussel whose fantastic natural machines were the basis of his complex structural associations in his writing. The work of artist Charles Simonds and his push towards a biological architecture may also be of importance to my investigations.

In conclusion, my thesis is intended to be a compilation of the issues that I have come to be most interested in through my academic life. The project, it is hope, will act as a catalyst in which to explore those issues which concern me, the environment, man's role upon the Earth, and the relations of men and women with each other as they are working towards a certain goal.
The context in which my thesis project is situated is one of isolation. The group members have gathered here for the various advantages that the site allows including the natural source of power from water, unlimited agricultural potential for self-support and revenue generation if needed, a loose connection to the existing society which they strive to escape, and the materials of existing structures and some natural resources for the completion of their project. The map below gives representation of these amenities.
BIBLIOGRAPHY


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And so the story begins.
This is the site plan— a farm in Southern Indiana along Interstate-65. The scale is 1"=120'-0".
The farm contains a barn.
The participants in the story will go to this area of the farm to build their community. The scale is 1"=30'-0".
THE STORY
The Romantic's house is made of these parts of the summer kitchen, and she uses part of the barn.
And now the barn looks like this.
Her work keeps her so busy I feel intrusive and decide to move on to visit the Loner.
I visit the Loner to inquire into her house-building progress.
The Loner's house uses these parts of the livestock barns. And she uses part of the base.
And now the barn looks like this.
After a short and strained visit, I remember my appointment with our Leader.
I approach the leader with respect so that he might feel inclined to allow me a loan from the barn.
The Leader's house is made of these parts of the horse stable. And he uses a lot of the barn.
And now the barn looks like this.
I came away with the additional material needed for me to complete the building of my house.
I am called over to the house of the Entrepreneur who instructs me in the limits of his concerns.
The Entrepreneur's house is made of these parts of the house. And he uses part of the barn.
and now the barn looks like this.
The visit drains me after an hour and I decide to take a walk towards our reflection garden.
Thoroughly rejuvenated, I approach the house of the Paranoid to offer my congratulations on a well-earned triumph.
The Paranoid's house is made of these parts of the mechanical warehouse. And he uses part of the barn.
And now the barn looks like this.
I run to the sympathetic in the hopes of an explanation to this ghastly turn in my story.
The sympathetic house is made of these parts of the mechanical warehouse, and he uses part of the barn.
And now the barn looks like this.
Disturbed, I venture home by way of the home of our Cheater.
The Cheater's house is made of these parts of the house. And she uses part of the base...
And now the barn looks like this.
I listen as she discloses her secret to me.
I return home to write the story of my day.
My house is made of these parts of the livestock barns. And I use part of the barn.
And now the barn looks like this.
Upon arrival I find a foul stench of a sewer flowing into my home from the source of the lover's outhouse.
The Lower house is made of these parts of the summer kitchen, and by using part of the barn.
And now the barn looks like this.
While I yell, a call is given for a community meeting at the home of the Swindles.
The Swindler's house is made of these parts of the horse stables, and he uses part of the barn.
and now the barn looks like this.
My abandonment of the community at first seemed undeniable until I realized that my interaction with it was vital to its existence. I had found that each part made the whole complete, had a role to play, and was a necessary event in the story. Together the pieces made the story complete. Later, I returned to the community to find the result of the imbalance I had created.
A farm had been born from the community.
THE END
THE REPORT
Perpetual Motion: An Architectural Comedy

The story that precedes this report is intended to be read in sequence through time. The story is referred to as a comedy, and it is an attempt to create an architectural design in the form of a dramatic account that is an exploration of idea and metaphor in architecture. This report is therefore intended as a companion to the proposal and to the story, as a brief explanation of how I, as author, have explored the course of this thesis, and as a guide to some of the beliefs, influences, and goals that the thesis and story are intended to convey. The topics that this report will discuss include a definition of perpetual motion and its meaning to the story, an explanation of alchemy and its relationships to the processes and forms of the characters and the architecture contained in the story, and an introduction to the influences which helped to shape and define the thesis through their impact on the design.

To begin an exact definition of perpetual motion is needed since its legend and history seem to bias the reader of the story from the first encounter with the term. Perpetual motion is the creation of more energy than the energy that is used in the process of the creation of that energy. Less technically it is best described in form or mechanics such as the never ending waterfall of M.C. Escher (Illustration 1) or in the countless numbers of machines created by the obsessed inventors who engage in its elusive quest believing unfailingly in its existence despite being proven wrong time and time again. To attain the goal, to believe in the capture of perpetual motion, is their search for truth and their search for perfection, the unattainable. And why can it not be achieved? We see examples of the seeming existence of perpetual motion all around us every day. The sun rises and sets. The moon’s phases are consistent through time. The lives and deaths of plants, animals, and people have continued in an endless, beginningless life cycle since man could first recognize them. Is it any wonder why so many great minds were obsessed with the notion of the capture of this unknown energy?

For the purpose of the story the enigmatic quality associated with perpetual motion is exploited. The quest for perpetual motion, this perfection, becomes the metaphor for life in art and in science. In the design of the community perpetual motion as the symbol of the natural, or organic, mechanical system manifests itself in the natural growth of the community. The participants in the drama, for example, choose their place on the land by feeling based on their ‘character’ or their qualitative
humanistic traits. This natural selection of site thus becomes the solid, unchangeable foundation from which the story is built.

Alchemy like perpetual motion became an important source of inspiration and metaphor early in the semester. The introduction of alchemy to me brought significant change and restructuring to the original proposal. The idea of alchemy as the transformation of lead to gold is simply a naive understatement.

"... The Great Work of the alchemists, the quest for the Materia Prima ... is of some interest to (Charles) Simonds, though not in the misunderstood sense of a naive attempt to transmute lead into gold. Alchemy was as much a spiritual discipline as a material procedure, the goal of which, in very simplified terms, was 'to know the centre of all things.'"

(John Hallmark Neff, Charles Simonds Towards a Biology of Architecture, 1983)

Reading further, I realized that to C.G. Jung in his study, Psychology and Alchemy (1944), he equated alchemy to an effort to reconcile the inner and outer man, an ongoing quest to attain a wholeness of being and to attain a certain perfection through the self-exploration of the alchemist of his own psyche. The comparisons of perpetual motion and alchemy seemed too numerous to ignore, and therefore became an integral part of the structure of the thesis story. Most notably in the story the transformation of the barn structures into the community (lead to gold) became alchemy's greatest influence. In form alchemy became the primary source of inspiration most obviously in House 3, the Storyteller's or my house. Here the form of the house in plan becomes my own 'squaring of the circle'- an alchemic procedure where the outer circle is used geometrically to locate the place where the center, the Materia Prima, of the inner circle exists (illustration 2). Each formula for this geometric equation is distinctive to the individual alchemist.

Next, I would like to explore the numerous influences and their impact on the design of the story and on the community. The influences became, themselves, parts of the whole process and sequence of the story and the semester.

Of course the prime influences on the designs of each individual house in the story, and on the process of the design were the perpetual motion machines themselves. The position of the machines in the lives of the characters gave the architecture form and structure. Each house is either
designed around the machine, or the machine around the house.

Also, perpetual motion became the inspiration for the design of the process of designing the community. Each phase of design became a process of designing in a sequence, one to ten, the next phase starting again at one and repeating the cycle through the sequence.

The cycle of the story is also from perpetual motion (Illustration 3). The story begins in a seemingly positive, upward movement until the discovery of the paranoid, dead. This weight carries the story over the climax and towards the conclusion where the illusion of a continuation is created. The second half of the story deals with the discovery of the faults in the community which bring the story and the weight back down to equilibrium. Illustration 3 shows the comparison of the story structure to a flywheel machine, the most 'efficient' of perpetual motion machines.

As stated earlier, perpetual motion machines became the symbol in the story of the natural or organic mechanical system, hence, the natural process of site selection was initiated. This idealized process was from the influence, also, of the Ciudad Abierta project in Chile where "... the locations of the various projects would be chosen by means of a series of poetic acts" (AA Files, Ciudad Abierta by Rodrigo Perez de Arce, 1989). This project and the work of Rodrigo Perez de Arce and his Urban Transformations & the Architecture of Addition(1978) were of primary influence for most of the proposal of this thesis and the initial discoveries at the beginning of the semester. "The new city was to be conceived, not in terms of scale, population density or organizational activities, but in terms of its public institutions- the 'agorae'- where poetry could be revealed, and life and art would grow together" (AA Files, Ciudad Abierta by Rodrigo Perez de Arce, 1989).

Jung's explanation of alchemy as the self-exploration of the alchemist's own psyche was of profound impact on the design of the story and the characters themselves. The discovery of Jung's view helped me to understand that all the characters were actually parts of myself and that each part was integral to the whole of the story. This, obviously, is the most important revelation in the story, and its impact was felt through the design on all levels.

Of course these are only some of the strongest influences towards the thesis. Far more ideas are not recorded simply due to their countless numbers. Some of the numerous influences are Escher's perpetual staircase in House 3 (illustration 4); the dualities of the characters, of their internal conflicts, of perpetual motion to alchemy; my interest in natural mechanics; the work of Charles Simonds; my concern for the environment; etc. I must
agree with Rodrigo Perez de Arce's view on this point that we are a product of all that we know or have experienced, and ". . . it is important to understand that there is nothing in the world that has been invented from scratch. I believe there is no possibility of Tabular Rasa, therefore the role of tradition, in terms of a background of ideas, is always very important" (Lunchline Tapes, CAP, BSU, 1989).

Finally, I would like to state that this work, this thesis, is intended to remain unfinished. It is merely a piece of a larger whole like a piece of the puzzle model in the slides. I hope that this thesis might at least catch the readers interest and hopefully help that reader see some of the references I have concealed in the story. Some of these references are to society, to the environment, to architecture, to poetry, and so on. Most importantly, I would like this thesis to act as my personal view of these references, and as my first attempt (of many) to try to attain a certain perfection. Americans may someday see the importance and value a regenerative place where ". . . people have lived for such a long time within the same place that the components of the city are constantly regenerated, very often through some action of redefining a fabric which already exists there" (Lunchline Tapes, CAP, BSU, 1989).