The Relationship between Human Beings and Nature

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Rochester Institute of Technology

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Master of Fine Arts

The Relationship between Human Beings and Nature

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Abstract

The symbolic value of art helps me as a metal artist to depict the relation between human beings and nature. Humans have created a culture and a world but this world appears to coldly separate itself from its surroundings. Life continues to assert its will on human creation; plants sprout amongst concrete and steel environments. The composite shape of my sculptures and thesis help me to present a contemporary perspective on this issue.
Introduction

Man cannot exist without nature. There is close relationship between humans and nature. All of us in the present-day world rely on the land, water, and air around us. However, human beings often forget about nature's contribution to human life. This project explores the relationship between geometric design and material from nature, such as grass. The cold, dark feeling from metal and sharp geometric angles is in opposition to the natural warmth found in natural plants, such as grass.

The exploration of the relationship between the metallic and natural was revealed through a series of jewelry and architectural sculptural forms. Of the eight jewelry pieces, four were made in pure silver and four were made in aluminum with metallic accents. The use of pure silver was an attempt to demonstrate the purity of nature in contrast to the other pieces. In contrast, the metallic pieces were designed to reflect modern city life.

The small architectural sculptures were designed using nickel and silver. Nickel's uniquely bright, sparkling luster gives a cooler feeling than silver. In the larger architectural pieces, a liver of sulphur technique was used with the copper pieces. This method darkens the color of the copper and gives the pieces a mysterious feel. The mysterious feeling was intended to reflect the mystery of nature.

The challenge of this project was to find a balance between the harshness of metal and the softness of nature - how can grass survive among the man-made geometric shapes. This project also attempted to express that nature can be a source of relaxation and comfort even in complicated modern life.
Study of Polyhedron, Multi-Cubic Shape and Nature

The History of Polyhedron in Art

Polyhedrons have existed since the birth of mankind. Since prehistoric times, polyhedrons have been an integral part of tool and shelter design. In some societies, different polyhedrons held religious meanings. In particular, the hexahedron was believed by many ancient peoples to be a powerful geometric shape. Evidence of this belief is found throughout recorded history.

The Egyptian Pyramids

Ancient Egyptians were the first people to think about the effect of their actions on nature. Prior to the Egyptians, there is no record of any understanding of how human actions affected nature. Unlike other civilizations, Ancient Egyptians believed that man was only one element of nature. Other people believed that man was the center of the world.

The unique belief of the Egyptians meant that they had respect for nature. This is evident in their beliefs about the Nile River. The Nile River was central to the survival of the Egyptians because the flooding of the Nile provided food for the people. Farming in ancient Egypt depended on the flooding of the Nile River. With each flooding, the divisions between the plots of land were erased and had to be redrawn. This led to the development of geometry. The word
geometry comes from “geo” which means land and “metry” which means measuring. The yearly measurement of the land led to the birth of geometry and the beginning of the development of geometric understanding.

As the civilization progressed, Ancient Egyptians began applying their knowledge of geometry to other areas of their lives. The most well known use of geometry can be found in the pyramids. Pyramids were built by the Ancient Egyptians as far back as B.C. 3000 for religious and funerary purposes.

Pyramids served as tombs for the kings of Egypt. They helped ensure a successful trip to heaven so that a king would have a good afterlife. Egyptians believed that kings would return to the earth as another king. The building of pyramids showed the power of the kings. As the kings grew in power, the construction of pyramids began. Pyramids required a lot of man power and the ability of a king to direct the building of a large pyramid was evidence of his royal power.

The earliest type of pyramids were built of loam bricks. Since loam is not a very strong material, these pyramids were not very large. These pyramids had a square base and each layer of the pyramid was smaller that the one below creating steps on the outside. These steps were supposed to help the buried king reach heaven. Following, loam pyramids, pyramids known as Mastaba were built. Mastaba means “rectangular structure” in Arabic. These pyramids were much larger than the loam pyramids and built of stone cut from the earth. The sides of the
Pyramid also became smooth and the stairs of the earlier pyramids was no longer seen.

Pyramids have a very specific structure due to the beliefs of the Egyptians. They believed that a square shape was the most stable shape among polygons and used that as the base of all their pyramids.

Pyramids are the greatest example of the Ancient Egyptian belief of man being one of the elements of nature.

[Figure 1] A loam pyramid in Egypt
Ancient Greece

The Ancient Greeks believed that nature was the strongest force that existed. The power of nature was even greater than that of the gods. In their study of nature, the Ancient Greeks made many geometric and mathematical discoveries. They discovered many new shapes by observing the multiple polygons that exist in nature. In addition, much mathematical advancement was made as they tried to prove different laws of nature.

As a warring nation, Ancient Greece looked to develop more advanced weapons. Through this desire, they were able to utilize various shapes for war purposes. For example, they were able to make their catapults more accurate. Using mathematical calculations, the Ancient Greeks were able to adjust their weapons to hit their targets.

Architecturally, the Ancient Greeks use their knowledge of geometry to create such notable buildings as the Parthenon. As with the Ancient Egyptians, the Greeks also used square shapes as the base of their constructions. Even at the bottom of the pillars of the Parthenon, the base is a square shape. This shows that the square was still considered the most stable base design. The Greeks made much advancement in brick design and use, which allowed them to build much higher and larger buildings than previous civilizations. Many of their buildings were built so well that they are still seen today.

[Figure2] Parthenon Temple, Athens, Greece
Ancient Inca

The Ancient Incans lived in a challenging environment. From deep forests to tall mountains, the Ancient Incans had to come up with ways to connect their kingdom and build shelters for their people. Just as the Ancient Greeks studied the natural world around them, the Incans studied their environment so that they could build and expand their empire.

Stones were used in all parts of Incan life. Not only were their buildings made of stone, but their roads as well. What makes Incan buildings so impressive is that no mortar was used in the construction. Although other civilizations used mortar to fill in gaps between bricks, the Incans were able to make bricks that fit so well with each other that there were no gaps. If gaps or holes existed in the construction, the Incans would make a brick that would fit into the opening rather than using a filling material such as mortar. Their ability to engineer bricks so precisely allowed them to build large stone buildings. The bricks were made so that no space existed between them.

Bricks also had religious significance in Incan culture. They believed that the world needed to be anchored down to prevent disaster. The stone brick was believed to be the strongest force and capable of anchoring the world. Thus, the Incans tied a piece of string to a large stone brick in hopes of preventing disaster.

[Figure 3] Inca Trail Machu Pechu
Le Corbusier

Le Corbusier, a famous modern architect of the early twentieth century, is recognized as the first architect to incorporate the use of outdoor nature elements in his building design. Not only did he consider how building design could make human movement within the structure more efficient, he also used windows to bring the outdoors inside. For example instead of building stairs that went straight from one floor to another, he created a landing in the middle that looked out to a tree. The landing was a place of rest and place where a person could observe natural life. Thus, much of Le Corbusier’s design has many windows.

Le Corbusier’s most famous contribution to architecture is his use of reinforced concrete and polygon shapes in his design. He was concerned with the problems of industrial housing that he saw in cities at the turn of the twentieth century. He felt that city housing led to crowding, dirtiness, and a lack of a moral landscape. Le Corbusier was a leader of the modernist movement to create better living conditions and a better society through housing concepts. He focused on design to solve the issue of the harmony between human activities and the natural environment. The best example of this is Le Corbusier’s Villa Savoye, which showed his belief that clean and simple functional design is the most beautiful.

[Figure4] Villa Savoye by Le Corbusier

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Frank Lloyd Wright

Frank Lloyd Wright is the first architect to use the word “organic” in discussing buildings. He designed buildings around the idea that nature and human creation should coexist in harmony. He defined “organic architecture” as a harmonization of “time,” “place,” and “human.” His design was very angled and simple, but natural and comfortable.
Van der Rohe, who was both a furniture designer and an architect, is a pioneer in the modern architecture movement. Most of his designs made heavy use of steel and glass. His use of steel as a building material was revolutionary. Until this point, buildings only used steel to reinforce concrete. The use of glass was intended to bring outside nature to the inside. When describing his use of glass in the Farnsworth house, van der Rohe said:

Nature, too, shall live its own life. We must beware not to disrupt it with the color of our houses and interior fittings. Yet we should attempt to bring nature, houses, and human beings together into a higher unity. If you view nature through the glass walls of the Farnsworth House, it gains a more profound significance than if viewed from the outside. That way more is said about nature — it becomes a part of the larger whole.²

Van der Rohe also made significant strides in building design concepts by creating rooms that had four walls of glass allowing the people inside to see what surrounded them outside. In the process, the furniture, which van der Rohe designed himself, was placed in the middle of the room instead of up against the walls. Finally, van der Rohe always built his building on top of supports because he did not want to damage the grass that would disappear if the building were built directly on top of the land.

[Figure6] Pavilion by Mies Van Der Rohe
The History of Modern Simple Design in Art

The Bauhaus school of design perspective combined crafts and fine arts. The focus was on functional design using geometry with clean and simple lines. In particular, during both World War I and World War II, the Bauhaus school exhibited the application of polyhedrons in industrial and furniture design. In spite of its name, and the fact that Walter Gropius was an architect, the Bauhaus did not have an architecture department during the first years of its existence. When Mies van der Rohe assumed leadership of the Bahaus school, architecture was added to the curriculum.

Following van der Rohe, under Hannes Meyer’s directorship, the Bauhaus school’s theme was expanded. Meyer identified two themes: the people and the landscape. He defined people to include considerations of lifestyle, community, and soul. Landscape was a consideration of the environment in which a building was being built. Meyer’s call for harmony led to an intersection of these themes.\(^3\)

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\(^3\) Droste, Magdalena. “Bauhaus” Reform and Avant-Garde. Taschen, 2006. P. 64
The Bauhaus style is one of the most influential currents in modernist architecture and modern design. The Bauhaus school has had a profound influence upon subsequent developments in art, architecture, graphic design, interior design, industrial design, and typography based on modern simple design.\(^4\)

\[Figure?\] Dessau Bauhaus Building in Germany

Vkhutemas, which had a similar scope and intent as the Bauhaus school, was the Russian state art and technical school founded in 1920 in Moscow. It was a center for three major movements in avant garde art and architecture: constructivism, rationalism, and suprematism. In the workshops, the faculty and students transformed views of art and reality with the use of precise geometry with an emphasis on space, in one of the great revolutions in the history of art. In comparison with Bauhaus, Vkhutemas was a close parallel to Bauhaus in its intent, organization and scope. The two schools were the first to train artist-designers in a modern simple manner.

In modern structures, the majority of configurations display geometric shapes that are easily found. The Bauhaus and Vkhutemas schools specialized in these design elements. Geometry is not only found in modern buildings but in buildings from ancient times. Over time the goals of design and the use of geometry in design has changed, but the use of shapes in design has not. The use of geometric designs to achieve harmony between building, nature, and human beings has been a theme throughout architectural history.
Development and Discussion of Work

Development of Work

Design and Process

The design process began with multiple perspective drawings of polygons to determine how to construct the shapes. Models were created using cardboard and metallic paint to get a feel for what the final product might look like. Prototypes of the small silver wire sculptures were made with pieces of wooden chopsticks. Plastic brushes were used to simulate grass. These preliminary designs were done to determine what direction the final designs would take. Designs were chosen based on how effectively the design could express the relationship between human beings and nature.

Form and Shape

There were some concerns about what forms would be able to best express the complexity of modern human beings. Instead of choosing a single shape, a combination of polygons was used to express complexity. Grass was used to symbolize nature. The relationship between human beings and nature was expressed by putting the grass in a polygon vessel.
Materials

Different types of metal materials were used in the construction of pieces shown at the Thesis Show.

The polygon sculptural series, which were known as the small architectural structures, were made in a series of five nickel and silver pieces. Nickel was the material of choice in constructing the base for several reasons. Aesthetically, nickel gives viewers a cooler feeling than silver. The cooler feeling of nickel was desired to impart to viewers a feeling of urban buildings, such as skyscrapers. Other metals, such as stainless steel, are more difficult to work with, which made nickel the metal of choice.

The design atop the nickel base was constructed of sterling silver. Despite the similar visual properties of nickel and silver, silver was used to impart to viewers a purer and warmer feeling than nickel. This was intended to show the connection between humans and buildings in urban life, while conveying the idea that humans are of a more pure and natural state. When viewed separately, nickel and silver may be confused for each other, but together, the metals exhibit their unique properties. Thus, human beings and urban buildings are not very different, but contrasted next to each other their differences are apparent.

For the medium architectural sculptures, the main structure was constructed using copper sheeting. These structures were intended to represent nature. The warm reddish copper color was darkened using a liver of sulphur technique. The uneven coloring of the copper structure was intended to convey the impression of dirt and give viewers a more organic feeling. As in the small sculptures, nickel represented urban buildings. The smaller nickel vessels with grass in these compositions are intended to show that nature can be held by urban constructions in the
same way that buildings are held by the earth.

Finally, two series of jewelry pieces were designed. The first series of brooches utilized fine silver and sterling silver. In these brooches, fine silver was intended to represent the urban. Nickel was not practical in this application due to its weight. Fine silver provided the appropriate contrast to sterling silver. The sterling silver, as in the small sculptures described above, represented the human element.

In the second series of jewelry pieces, aluminum and sterling silver were used, fastened by titanium bolts. In this series, the aluminum pieces were colored using metallic paint and affixed to the sterling silver base with titanium bolts. The coloring of the aluminum was intended to express the individuality of human beings, which again is represented by the sterling silver.
Techniques

The works in this project are largely divided into two parts – sculptures and jewelry. In constructing the sculptures, scoring, welding and soldering were used. Scoring was used to create the clean geometric lines that were desired. Despite nickel’s hardness, a quick and precise welding technique was necessary due to nickel’s narrow melting point range. Nickel melts at 1,455°C (2,651°F). If the welding is not done precisely, nickel will rapidly melt and thus, the utilization of nickel in these structures was the greatest challenge. Welding of nickel is also challenging due to the gases released during the welding process. These same problems do not exist when working with copper. Soldering of the different metals did not pose any of the challenges found during welding. The challenges posed by soldering were found in manipulating the silver square wire to the desired geometric shapes. Soldering jigs were constructed for fabricated each silver wire angle.

During jewelry construction, welding was not used. In addition to scoring and soldering, jointing with titanium bolts was used in the jewelry making process. To create accurate holes in the jewelry pieces, much time and patience was required. A small jewelry blade was used to ensure precision in producing the final product. In the brooches of sterling silver and fine silver, the two metal layers were soldered and then burnished. Burnishing helped clean up the soldering and imparted a shine to the final product.
Discussion of Work

Five Nickel Sculptures

The inspiration for the small sculptures was inspired by in the Trump Plaza Building on Fifth Avenue in Manhattan, New York City. The Trump Plaza has trees planted on the building’s structure as part of the design. Not only was this design innovative and impressive, the design was a realization of the idea that nature and urban building can coexist in harmony. Expressing this harmony was the theme and goal of this project.

Finding the appropriate materials and shapes to express the harmony between human beings and urban buildings was the greatest challenge for my thesis project. A number of drawings were executed to discover the best method for expressing this theme.
[Figure 9] Small Architectural Sculpture (Nickel, Silver, Grass 5 X 5 X 4.8 inches)

[Figure 10] Small Architectural Sculpture (Nickel, Silver, Grass 5 X 5.7 X 5.1 inches)
[Figure 11] Small Architectural Sculpture (Nickel, Silver, Grass 5 X 5 X 4.9 inches)

[Figure 12] Small Architectural Sculpture (Nickel, Silver, Grass 5 X 5.3 X 4.8 inches)
[Figure 3] Small Architectural Sculpture (Nickel, Silver, Grass 5 X 5 X 4.7 inches)
Four Copper Sculptures

The welding techniques used in the fabrication of the copper sculptures were learned at RIT. Prior to construction, a large number of preliminary drawings were completed and the liver of sulphur technique was practiced for use in the final design. The coloration achieved by the liver of sulphur technique was used to give each piece a more organic feel. The goal of coloring the copper was to give the impression of the soil in which plants grow. Welding was chosen over soldering to give the final product a uniform look. Soldering would have left slight discoloration that would have detracted from the feel of the final design.

[Figure 14] Medium Architectural Sculpture (Copper, Nickel, Grass 8 X 8 X 3.8 inches)
[Figure 15] Medium Architectural Sculpture (Copper, Nickel, Grass 8.3 X 8.1 X 3.8 inches)

[Figure 16] Medium Architectural Sculpture (Copper, Nickel, Grass 8 X 8 X 5 inches)
[Figure 17] Medium Architectural Sculpture (Copper, Nickel, Grass 8.7 X 8 X 3.9 inches)
**Four Silver Brooches**

In this series, pure silver served as the base for the brooches. Holes were sawed into the sterling silver overlay to give viewers the impression of windows and allow the darker pure silver to be seen. This was intended to show that when we look into the soul of modern man, the industrial, urban qualities are apparent. Initially, including natural plants was considered, but for the practical use of brooches, plants were not included in the final design.

[Figure18] Brooch (Silver, Sterling Silver 2 X 2 inches)
[Figure 19] Brooch (Silver, Sterling Silver 2 X 2 inches)

[Figure 20] Brooch (Silver, Sterling Silver 2 X 2 inches)
[Figure21] Brooch (Silver, Sterling Silver 2 X 2 inches)
Four Silver Brooches

The four brooches with colored aluminum were made to express the existence of human beings in an industrial society. The desire to demonstrate the effect of industrialization on human life led to the use of nuts and bolts to give the impression of a machine-like modern life. Unlike the sculpture series, natural plants were not used for practical purposes. The use of plants would hinder the functional use of the brooches. The colored aluminum pieces were intended to reflect the individuality found among human beings. In this jewelry series, unlike the other, there was no base plate, so weight considerations were not an issue.

[Figure 22] Brooch (Sterling Silver, Aluminum 2 X 1.2 inches)
[Figure23] Brooch (Sterling Silver, Aluminum 2 X 1.2 inches)

[Figure24] Brooch (Sterling Silver, Aluminum 2 X 2 inches)
[Figure 25] Brooch (Sterling Silver, Aluminum 2 X 1.2 inches)
Conclusion

This project attempted to fulfill a number of objectives. The first is for the pieces to serve as a warning to society about completely neglecting natural life in our quest for industrial advancement. Secondly, the pieces attempted to provide a demonstration that natural life can exist within the harsh urban landscape. Just as the Trump Plaza building had trees growing as an integral part of the building, nature can be integrated into urban life. The planting of grass in the nickel vessels attempted to show that nature can be grown in an urban construction, just as urban buildings have been built into nature’s landscape.

Human life has evolved considerably over the ages. Each era of development has introduced more complexity and variety into human life. Although much of human life today is constrained by the demands of urban life, human beings are essentially from nature. Ignoring nature will eventually lead to our destruction. Thus, we must remember to harmonize the natural world from which we come with our newer more industrial environments.

The harmonizing of nature and urban environs is an important aspect to the future development of mankind. Nature gives us inspiration that we cannot find in our geometrically dominated urban environments. This is seen in the trends of artists who use natural objects in their work. The use of metal and grass in this project is an attempt to bridge nature with urban life. In many ways, we can think of this connection as a grafting of two worlds.

Choosing angular shapes was suitable for representing contemporary human society. By combining several shapes, modern human life style and geometric beauty were expressed. Raw metal materials demonstrated the feelings associated with modern life. Nickel presented to viewers the cool feeling of the busy modern human being, while silver and copper gave a
warmer feeling that is associated with more natural concepts.

Although this project focused on the use of angular geometries, future explorations of this theme might include more free flowing geometries, such as curves and oval shapes. As for the natural elements of this project, future designs may benefit from the utilization of other element from nature, such as rocks and soil.
Bibliography


