THE CHARACTER OF GAMES AND THE MONUMENT
OF STONEHENGE, AS REFLECTED IN MY CERAMIC SCULPTURE

by

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For his thoughtful guidance, it is with pleasure that thanks is extended to my major professor, Mr. Angelo C. Garzio, Professor of Art, Kansas State University.

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Chapter I

INTRODUCTION

This paper is a discussion of my ceramic sculpture which deals with movement derived from games, the related mathematic arrangement of Stonehenge, and how this monument's mystical quality has affected my creative work. The paper offers an approach that one may use when looking at my sculpture. I do not put forth theories or conclusions about art, but instead will discuss my creative thought processes as stimulated by the use of selected imagery.

The use of game imagery serves two purposes: (1) to instigate thoughts on movement which are characteristic of game boards and courts and (2) to encourage the viewer to visualize the options available to him due to the existing alignment of parts. Such an approach gives the viewer an opportunity to rearrange these parts imaginatively.

I feel the need for an organized approach to my art in much the same way as games must be organized, for they do not have movement without a purpose. The ancient English monument of Stonehenge became a logical choice for study. According to the latest theories ancient men erected its stones in such an order that would plot the movement of sun and moon. The purpose of Stonehenge established the order of forms in much the same way as the purpose of a game determines its form and physical characteristics. My work has also been affected by the structures at Stonehenge due to the expressive qualities of these forms. They, for me, signify the existence of a power beyond everyday life and arouse
my wonder at the universe.

I will begin with an explanation of game imagery. Following this will be a study of Stonehenge. The significance of both these topics to my creative search will comprise the final thoughts of this paper.
Chapter II

GAME IMAGERY

To understand fully my sculpture, an explanation of game imagery and how I interpret it in my work, is needed. It is quite natural for people to associate the term "game" with fun. In my work, however, I do not use games and their related imagery for the purpose of amusing the viewer, as will be explained later. First, I will begin with several explanations of games as viewed by game theorists. A basic knowledge of what a game involves provides a better understanding of my work. Game theory is described by Anatol Rapoport as follows:

it is easy to portray game theory as an extension of a theory of rational decisions involving calculated risks to one involving calculations of strategies to be used against rational opponents, competitors, or enemies; that is, actors who are also performing strategic calculations with the aim of pursuing their goals and, typically, attempting to frustrate ours.¹

This explanation suggests that a necessary element of a game is opposing forces capable of responding to strategic moves in a manner that best defends the positions. In other words, a responding opponent is a necessity. Only when at least two sides interact with conflicting interests involving the same goals, can there be a contest.

This explanation, by Martin Shubik, introduces another aspect of game theory.

Game theory is a method for study of decision-making in situations of conflict. It deals with human processes in which the individual decision-unit is not in complete control of other decision-units entering into the environment.\textsuperscript{2}

The decision unit referred to here may be defined as any two or more individuals or groups; examples would be a politician trying to win a nomination or generals engaged in battle. Such conflicts may be viewed within the context of a game.

A game, in essence, involves the making of decisions between units whose goals are different and whose fates are intertwined. Each unit has a certain amount of control over the outcome, but it cannot be in complete control over the other decision units.\textsuperscript{3}

So far we have viewed explanations which emphasize the strategy and decision-making aspects of games. The following description by Guillermo Owen reviews additional game elements.

The general idea of a game is that with which we are familiar in the context of parlor games. Starting from a given point there is a sequence of personal moves, at each of which one of the players chooses from among several possibilities; interspersed among these there may also be chance, or random moves such as throwing a die or shuffling a deck of cards.\textsuperscript{4}

This description introduces the element of pure chance, not the kind of chance to be expected when making a calculated risk but rather the kind of chance involved when one, for instance, spins a roulette wheel. Here the player has no control over the lifeless machine that determines the next move. In such situations the participant relies on fate or chance to determine the final outcome.


\textsuperscript{3}Ibid., pp. 8-9.

Games against nature is a phase of game theory which has close correlation with my work. According to such game situations, nature plays the part of a fictitious participant and man, the opposing force, has no knowledge of the strategy or objectives being employed by nature. Man tries to predict the motives of nature in order better to prepare for the outcome.

Take for example a primitive people, as they are closely affected by natural changes of the environment. When violent weather or earthquakes occur and their homes and crops are threatened, they might understandably try to predict these natural events with the intention of preventing such destruction from recurring. In the process of trying to arrive at preventive means, probably in the form of religious rituals and offerings, the people would necessarily have to make many assumptions concerning the motives of nature while not knowing anything of its strategy or objectives. If, after employing preventive measures, nature proves agreeable, the people might surmise that they have made the proper "move". If, however, nature again is destructive of homes and crops, the people might naturally assume that their move has been badly calculated.

Primitive man's attempt to understand nature, and perhaps to do so in a game-like fashion is well expressed by Henry Osborn.

the wonders of nature in their various manifestations begin to arouse in the primitive mind a desire for an explanation of these phenomena, and in which it is attempted to seek such cause in some vague supernatural power underlying these otherwise unaccountable occurrences, a cause to which the primitive human spirit commences to make its appeal.

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5 Shubik, op. cit., pp. 120-21.

To coerce the spiritual powers, or to square them and get them on our side, was, during enormous tracts of time, the one great object in our dealings with the natural world. 7

With these theories in mind, I will explain why I chose game imagery as a source for creative expression.

Many types of games exist, with participants, motives and strategies meeting countless descriptions. I have chosen not to use social games as a basis for expression even though the confrontation between two or more people contains the necessities for a game situation. I have chosen, rather, to use games only which utilize boards, courts or fields. Checkers, Chess, Basketball, Croquet and Football are all possible sources for imagery.

There are four reasons for limiting games to these types:

1. Precise rules are employed which govern the design of the board and playing area, player actions and options. These elements parallel my preference for organization. 2. Potential movement can be immediately sensed. Depending upon viewer knowledge of the particular game being played, various courses of action may be detected. 3. Due to mathematical arrangements inherent in board and court games alignments occur which stimulate my thoughts on form relationships. 4. Forms such as balls, hoops, and poles serve to suggest movement to the viewer as well as to myself.

Viewer awareness of movement is due to the alignment of points on the playing board as well as the elements of the board itself. Playing boards and courts are laid out based upon mathematical alignments which serve to carry the eye from point to point. Player movement follows this mathematical design.

7Ibid., p. 359.
Due to the visual organization of the game board action is implied before physical movement has even occurred. Take for example a grid board such as used in chess. Placed in one of the squares is a bean. The viewer may likely feel a desire to release the bean from its present border of confinement. As a result he may begin to consider possible escape routes, namely the options offered by any one of the four sides, or corners. At this point, movement and options have already begun to occur in the mind of the viewer (Fig. A).

The actual forms used in board and court games suggest movement. If the bean mentioned above is replaced with a ball a still greater sense of movement is introduced because spherical forms are often equated with instability due to their tendency to roll in unpredicted directions (Fig. B). If a hole is present in one of the squares a strong relationship will exist between itself and the ball due to the alignment and types of form. Even though the ball has the option of moving in seven other directions the strongest tendency is for the eye to move the ball toward the hole (Fig. C). Here the ball and hole promote visual tension. It is this kind of tension that I attempt to incorporate into my work in order to create movement in the midst of organization. "Movement is the indication of eye travel through visual paths."8

In court games, such as croquet, movement may be established before action actually takes place, due to the geometric alignment and repetition of parts. The viewer's eye will most likely travel from wicket to wicket. When a ball is introduced a mental movement, similar to that of the grid, ball and hole situation is established because of

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Figure C

Chess situation

Figure D

1 2 3 4 5 6 7 8

a b c d e f g h

K-white  K-king  B-bishop
k-black  Q-queen  KN-knight
size, form and alignment relationships of ball and wicket.

If the viewer is knowledgeable about a particular game then immediately he is able to imagine more movement taking place than is a person who has no understanding of the game. In chess, for example, a knowledgeable viewer will see that the black king is in check, and thus it is black's move (Fig. D). The viewer will examine the defense options available. This examination will most likely be done by determining the chessmen involved. In doing so the movement options become apparent because the form of the chessmen are automatically associated with particular types of moves. If black makes a queen 3B move then regardless of white's counter defense, the game will be eventually won by black. Awareness of "movement" has been subconscious in precisely the same manner in which I try to involve the viewer with the movement of my sculpture.

Game imagery used in this manner will provide the viewer of my sculpture the opportunity to recognize relationships of parts depending on whatever movements stimulate him most. Game motif may never even enter the viewer's mind, and this is perfectly acceptable because the movements and form relationships still exist hopefully, to furnish him with a visual excitement.

I will discuss one of my sculptures in order to provide practical understanding of game imagery actually being employed (Plates 6a, 6b). In explaining this piece, I do not wish to imply that a mathematical formula was used. Many of the form relationships were intentionally sought at the outset while others were discovered in actually building the piece and still more occurred subconsciously. In any event, the relationships and form characteristics were the result of my thoughts on
games (Fig. Ea and Eb).

This ceramic sculpture titled: "and all of the people went down to the beach to see the sun. The green monster came out of his hole and sat down to play games with a friend." may be interpreted as a juxtaposition of rectangles and squares produced by the location of the small form reliefs on top. Viewing the piece from above, the small forms radiate from the center of the large rectangle in such a way as to establish a square alignment. When an imaginary line is drawn through the middle of the forms, a 45° angle can be established through the ball and associated form in the upper left hand corner. If lines are drawn in the directions which the two forms on the right (side D) indicate, then the upper line will intersect the original 45° line and the lower line will meet the two bottom forms. A right angle from this line touching the lower left form will run into the 45° line. This will create a square that is turned 45° from the original plane. It is this shifting which helps to create movement by the use of visual paths.

From the side, this piece shows a series of curves and thus creates a relationship between circular and right angle shapes when compared with the top. The small forms on top are in three groups of two. They interrelate with each other in a similar way as do members of a basketball team.

Game imagery serves merely to spark movement and form relationships while the piece is being created. I do not compel the viewer to see only games when he looks at my work for the game motif is purposely made subtle.
Figure Ea  TOP VIEW

Figure Eb

side a
Chapter III

STONEHENGE

Seeking to expand game imagery, I became interested in finding a subject for study which would reflect man's wonder at the universe and his attempts to understand it. Stonehenge, located in England on the Salisbury Plain, became the logical choice because it was possibly out of these reasons that it was created. I singled out Stonehenge for study because to me it, more than any other monument, contains a significance of form and spirit which vitally relates to the qualities which I seek to express in my work. The forms at Stonehenge allowed men to examine the wonders of the universe by the use of alignments similar to the manner in which I try to reflect my own wonder at the universe. The huge simple forms evoke an overwhelming feeling of something beyond ourselves. Stonehenge relates to game imagery because of its organization; All parts interrelate and all were created for a purpose. Gerald Hawkins describes Stonehenge as

a marvel. As intricately aligned as an interlocking series of astronomical observing instruments (which indeed it was) and yet architecturally perfectly simple, in function subtle and elaborate, in appearance stark, imposing awesome, Stonehenge was a thing of surpassing ingenuity of design, variety of usefulness and grandeur, in concept and construction an eighth wonder of the ancient world.9

Stonehenge is unique. In all the world there is nothing quite like the gaunt ruin which Henry James said "stands as lonely in

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Plate 1
View through the moonset trilithon
#57-58, and the sarsen arch
history as it does on the great plain". Immense and still, it seems beyond man, beyond mortality. In its presence, within those silent circles, one feels the great past all around.\footnote{Hawkins, op. cit., p. 1.}

Plate 2
View of Stonehenge from the south

In order to comprehend the awesome quality of Stonehenge, which is due to the purpose for which it was built and the forms particular to it, it will be necessary to give a brief historical outline. This will present a better understanding of why I have found the monument to be of such influence on my work (Fig. F).
Plan of Stonehenge as it stands today
Stonehenge is located in the county of Wiltshire, on the Salisbury Plain, in southern England.\textsuperscript{11} It was constructed by late Stone Age and early Bronze Age people in three phases. The first phase of construction was begun in approximately 1900 B.C. It consisted of a circular ditch with banks on either side, the outer banks are 380 feet in diameter. The ditch was left open to the northeast to create an entrance. The Heel stone (which is a large unsculptured megalith of sandstone) was placed in line 100 feet from this entrance. Fifty-six Aubrey Holes were dug just inside the ring of the inner bank. Four station stones were also erected during this first phase. These form a rectangle perpendicular to the midsummer sunrise line.\textsuperscript{12}

The second phase, started in about 1750 B.C., saw the addition of eighty-two bluestones, which are composed of igneous rock and weigh five tons each. These bluestones are thought to have come, via rollers and rafts, from the Prescelly Mountains in Wales, 240 miles away. The stones were erected in two concentric circles with a radius of thirty-five feet from the center of the original circle and had an entrance to the northeast. An avenue forty feet wide lined by ditches traveled northeast from the entrance in line with the Heel Stone and then turned right, to the Avon River, two miles away.\textsuperscript{13}

Beginning in 1700 B.C. the Stone Age ended and the Bronze Age began, along with the beginning of Stonehenge III A. The circle of bluestones was torn down and in its place eighty-one sarsen stones were


\textsuperscript{12}Hawkins, op. cit., pp. 39-47.

\textsuperscript{13}Ibid., pp. 48-51.
erected. "Sarsen" is a term that originated in the Middle Ages. It possibly comes from the word Saracen, or foreign, indicating the ancient myth that the monument may have been built by people from other lands. In the Middle Ages the saracen was associated with all that was antagonistic to Christianity. The sarsens are composed of gray sandstone that probably came from Marlborough Downs, some twenty miles to the north. These sarsens, made into five trilithons, form a horseshoe at the monument's center, which opens up to the northeast. "Trilithon" is a Greek word meaning "three stones". A trilithon consists of two upright forms topped by a crosspiece, or lintel. These stones weighed forty-five to fifty tons apiece and differed in height from twenty feet to twenty-one and one-half feet to twenty-four feet. They increase in size from the north end of the horseshoe to the center. The great central trilithon is the tallest. Its window faces the Heel Stone. The five trilithons were enclosed by a continuously capped sarsen circle of thirty smaller stones. These uprights weigh thirty-five tons each and form a circle ninety-four feet and four inches in diameter. The uprights are an average of eighteen feet tall, seven feet wide, and three and one-half feet thick and are buried to a depth of four feet. The lintels are an average of seven tons.

During the building of Stonehenge III B an oval of bluestones, consisting of twenty or more, was erected inside the horseshoe trilithon. This oval, however, was then dismantled. Twenty-nine Z holes were then dug which encircle the outside sarsen circle, and thirty Y holes were

14 Stevens, op. cit., p. 18.
dug outside the Z holes.\textsuperscript{16}

Stonehenge III C, the last building phase, took place probably before 1600 B.C. During this time nineteen bluestones were re-erected in a horseshoe shape within the trilithon horseshoe facing in the same direction and a bluestone circle was built between the sarsen circle and the five trilithons.\textsuperscript{17}

Recent research by Prof. Gerald S. Hawkins has brought to light the possibility that Stonehenge was an astronomical computer. His findings are summarized below.

Stonehenge marks the midsummer and midwinter solstice. The solstice marks the point when the sun is farthest north or south of the equator and is at the turning point of its present course. In the Northern Hemisphere the solstice is June 21, and marks the longest day of the year.\textsuperscript{18} These marks establish when the sun rises exactly over the top of the Heel Stone in midsummer, and sets through the vista of the great trilithon in midwinter.\textsuperscript{19} In addition, an eclipse of the moon or sun will always occur when the nearest winter solstice of the full moon rises over the Heel Stone.\textsuperscript{20}

Stonehenge remarkably plots the positions of the moon. The moon, making a northernmost declination of $+29^\circ$ will, in an 18.61 year cycle, establish a new northern declination of $+19^\circ$. This cycle constantly

\textsuperscript{16}Hawkins, op. cit., pp. 56-58.
\textsuperscript{17}Ibid., pp. 58-60.
\textsuperscript{18}"Solstice", Encyclopedia Chambers's (New ed.), XII, 700.
\textsuperscript{19}Hawkins, op. cit., pp. 107-110.
\textsuperscript{20}Ibid., p. 139.
repeats itself.\textsuperscript{21}

The monument also marks the half-way positions (equinox) between the solar and lunar north, south extremes thus establishing the beginning of spring and fall. In addition, a record of days can be kept accurately merely by moving a rock around the \( Z \) and \( Y \) holes, and solar and lunar eclipses predicted by rotating, in a counterclockwise direction, six stones around the fifty-six Aubrey holes.\textsuperscript{22}

It is amazing to me that the Stonehengers had the sensitivity and patience to observe the movement of sun and moon and mark their paths with such precision. If we are assuming that no written language existed at the time Stonehenge was being built (no evidence of written language has been found) then the entire feat, which took approximately 300 years to accomplish, assumes even greater proportion, especially when we realize how complicated the monument was to "read" by men far removed in time from the concepts and purposes held by the original architects.

The forms at Stonehenge were strategically placed for the purpose of creating alignments which correspond to solar and lunar events. Because of the precision involved when placing the stones one can automatically sense the organization.

Stonehenge has served to instigate my thoughts on form as it is related to a particular type of movement; the type of movement that is created when the eye is carried from one form to another by means of visual paths.

There are many stone monuments throughout the British Isles and

\textsuperscript{21} Hawkins, op. cit., p. 179.

\textsuperscript{22} Ibid., pp. 140-146.
continental Europe which, at first glance, appear to be similar to Stonehenge, primarily due to their circular layouts. Unfortunately most of these structures have been partially or completely destroyed by the forces of time and have not been excavated with nearly the thoroughness as has been devoted to Stonehenge.

The monument Callanish, which most closely resembles Stonehenge, is found in Scotland on the island of Lewis, northernmost island of the outer Hebrides. It is a circle with a thirty-seven foot diameter consisting of thirteen stones. An avenue 270 feet long of tall stones approaches from the north, and to the south this avenue is continued but is shorter in length and has smaller stones. To the east and west of the circle are extensions consisting of four stones each. This monument may well have been built as a result of astronomical observations. It possibly has significant alignments to the Pole Star.\textsuperscript{23} The alignments have been found to correlate with the sun and moon, thus establishing a calendar for determining the seasons.\textsuperscript{24} The importance of Callanish is great but not nearly as scientifically significant or physically impressive as Stonehenge. Gerald Hawkins makes the observation that "there are a great many numbers and alignments at Stonehenge, and numbers and lines never cease to fascinate people."\textsuperscript{25}

Mathematics is a tool which allows man to probe the unknown. In its complicated formulas the mystery of the universe is faintly reflected. Before Stonehenge can be fully appreciated it is necessary to


\textsuperscript{24}Hawkins, op. cit., pp. 185-196.

\textsuperscript{25}Ibid., p. 158.
realize the astounding degree of command that Stone Age Britons had of basic geometry. They, for instance, constructed stone or ditch circles whose circumference equals nearly three times their diameter, or more precisely, they reflect the fact that these ancient men knew how to determine the length of a curved line within 0.2 percent. Many egg-shaped circles have been found to be true ellipses. The ellipse is not the most elementary geometrical figure and the construction of one demands greater skills than the construction of a circle. It has been determined that megalithic builders used a standard of measurement, the megalithic yard which equals 2.72 English feet, as a basis for construction. Their circles and the use of such geometry extends back in time 4000 years.\textsuperscript{26}

It becomes obvious that in studying monuments such as Stonehenge we must keep in mind the fact that our ancestors were probably much more intellectually adept than we have always believed. Gerald Hawkins believes that those Stonehengers were true ancestors of ours. I think that the men who designed its various parts, and perhaps even some of the men who helped to build those parts, enjoyed the mental exercise above and beyond the call of duty. I think that when they had solved the problem of the alignments efficiently but unspectacularly, as they had in Stonehenge I, they couldn't let the matter rest. They had to set themselves more challenges, and try for more difficult, rewarding and spectacular solutions, partly for the greater glory of God, but partly for the joy of man, the thinking animal.\textsuperscript{27}

It is inevitable that forms carry inherent expressive qualities. The kind of forms characteristic of Stonehenge, to me, are suggestive of

\begin{itemize}
\item \textsuperscript{26} Hawkins, op. cit., pp. 150-153.
\item \textsuperscript{27} Ibid., pp. 117-118.
\end{itemize}
the wonder that man, from the beginning has felt in the face of the universe.
Chapter IV

CONCLUSION

The key to my creative endeavors has been the search for form and movement which has organization and a quality of wonder as expressed through monumental forms. Games and their associated imagery and qualities of movement and organization have helped to provide me with a vocabulary of form for expressing these qualities.

Stonehenge is thought by many to have been an astronomical observatory created by our Stone Age ancestors; but may also have doubled as an intellectual game between man and the natural forces around him.28 It is apparent that the Stonehengers went about their 300 year project with consistency of thought and organization. To this day their organization is reflected in the monument. I believe this organization is apparently due to consistent and meaningful forms and the alignment of these forms in such a manner that the eye intuitively senses a purpose behind every form and visual pathway.

The purpose of Stonehenge and the sense of meaning that the huge stones seem to radiate is, of course, very intangible but for me the forms are expressive of a timeless universe.

28 Hawkins, op. cit., p. 117.
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PLATE 3a

THE CENTER

Side view

Height 32"
Diameter 23"

PLATE 3b

Top detail of plate 3a
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PLATE 4a

GO DO IT ON THE MOUNTAIN

View of the top
Height 18" 
Width 10"
Length 20"

PLATE 4b

Three-quarter top view of plate 4a
PLATE 5a

End view of plate 4a

PLATE 5b

Side view of plate 4a
PLATE 6a

AND ALL OF THE PEOPLE WENT DOWN TO THE BEACH TO SEE THE SUN. THE GREEN MONSTER CAME OUT OF HIS HOLE AND SAT DOWN TO PLAY GAMES WITH A FRIEND.

Top view

Height 7"
Width 11"
Length 16"

PLATE 6b

Side view of plate 6a
PLATE 7a
TABLE ROCK
Top view
Height 12"
Width 13"
Length 26"

PLATE 7b
Side view of plate 7a
PLATE 8a
CONFRONTATION
Side view
Height 22"
Width 16"
Length 22"

PLATE 8b
Top detail of plate 8a
PLATE 9a

THREE PATES

End view
Height 19"
Width 9"
Length 23"

PLATE 9b

Side view of plate 9a
PLATE 10a

CONCEPTUAL MELTING POT

Side view

Height 11"

Width 11"

Length 11"

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PLATE 10b

Top view of plate 10a
PLATE 11a
SARSEN STONES
Dimensions of large form
Height 35"
Width 16"
Length 18"

PLATE 11b
Detail of plate 11a
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THE CHARACTER OF GAMES AND THE MONUMENT OF STONEHENGE, AS REFLECTED IN MY CERAMIC SCULPTURE

by

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B. F. A., Utah State University, 1971

AN ABSTRACT OF A MASTER'S THESIS

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MASTER OF ARTS

Department of Art

KANSAS STATE UNIVERSITY
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The focus of my creative effort has involved the creation of ceramic sculpture which expresses the mystery and wonder that man senses in the awesome universe which surrounds him. Selected games and theories have served to instigate a vocabulary of form appropriate to expressing this quality by means of their inherent elements of organization and movement. The English monument of Stonehenge was used as an additional source for imagery because of the spirit embodied in its massive forms and its relationship to games. A brief historical background as well as a possible function of the monument is discussed in order to help clarify the effect it has had on my work.

This paper involves an explanation of my creative thought and how it has been applied to my sculpture.