ELEMENTS OF CREATIVITY AND DESTRUCTION IN SCIENCE AND ART

by

Margaret Underwood

A Thesis Submitted to
the Faculty of the Graduate School at
The Woman's College of the University of North Carolina
in Partial Fulfillment
of the Requirements for the Degree
Master of Fine Arts

Greensboro
May, 1962

Approved by

Robert E. Partin
Director

APPROVAL SHEET

This thesis has been approved by the following committee of the Faculty of the Graduate School at the Woman's College of the University of North Carolina, Greensboro, North Carolina.

Robert E. Martin
Thesis Director

Oral Examination
Committee Members

Helen Thrush

Lee Rigsby

Warren Ashby

Robert E. Martin

May 8, 1962
DATE OF EXAMINATION

ACKNOWLEDGEMENT

To Robert Partin in appreciation for his patience and for his limitless source of inspiration to me.

PREFACE

This paper is written to show the correlation of my interest in science and art and how the mystery of unseen forces has manifested itself in my paintings.

In Chapter I, I am discussing levels of creativity and examining them from my point of view.

Chapter II is a discussion of some of the mysteries which the artist and the scientist are exploring in their search for order in the microcosm and the macrocosm.

Chapter III is a brief discussion of my paintings and how they are related to my concerns with creation and destruction.

TABLE OF CONTENTS

CHAPTER I

LEVELS OF CREATIVITY

The term "creativity" has different meanings for different people, and many of these meanings are contradictory. I find it necessary to examine this term from my own point of view in order to avoid confusion.

I believe that there are different levels of creativity found at various stages of an individual's life. Each level varies in depth and scope rather than type.

The most fundamental form of creativity is found in the young child. The product of this creativity can be observed in his paintings and drawings. Among the most important characteristics in his work are spontaneity and freedom. His is an uninhibited expression, where skills and the quality of the product are secondary. This early form of creativity lays the groundwork for more advanced levels or plateaus of creativity.

As we mature we lose a great deal of this spontaneity and freedom and replace it with control and proficiency. As this takes place, we reach another level of creativity which is a more productive one, since the individual has learned to manipulate the tools and materials used for the act of creation. In all probability, as the child grows to an adult, he becomes more objective and realistic in his representations. In drawing a human figure, he will try to duplicate what he sees.

The next level from this point is an inventive creativity in which the creator, by arranging existing materials, makes something new. This form of creativity involves ingenuity as the individual seeks new ways of seeing "old" things, or as Paul Smith, lecturer, teacher and designer, says in his book, Creativity, "The creative process is a manifestation of the ability to relate previously unrelated things."

Another level of creativity entails a new depth as the creator is able to penetrate and understand fundamental principles, and this requires a large amount of abstract conceptualizing skills. After he understands these basic principles and is able to make alterations in them or develop them further, the individual has reached a higher plateau in his creativity. The Cubists, with their new conception of the visible world, are on this level.

An even higher level of creativity is one that very few ever reach. This involves the ability to absorb the experiences which one has had throughout his lifetime and from them produce something quite different. These are the creators who can visualize beyond the general public's ordinary scope of perception. There are and have been many such creators throughout history. There was Albert Einstein and his Theory of Relativity; Schoenberg and his twelve-tone row; the artists of the Blue Rider group which included Klee and Kandinsky -- to name some of the few creators who reached this plateau of creativity.

Pure, or what might be called the ultimate, level of creativity, involves the bringing of something into existence from nothing. This power

belongs solely to the Supreme Being.

Creativity, in every sense of the word, is extremely complex, and defies a clearcut analysis.

CHAPTER II

THE ARTIST AND SCIENTIST IN THEIR SEARCH FOR ORDER

Science is science and art is art, but they have much in common, particularly in the creative spirit, without which neither could exist.

Scientists and artists are motivated in their creativity by the desire to penetrate the mysteries of the unknown. They are searching for the relationships of parts to the whole. They are looking for a meaningful unity in variety or meaningful order in seeming chaos. Their goal is the same, but their route is different. This study, however, is primarily concerned with their general similarities and not their differences.

Science and art are both involved in the exploration of the mysteries which surround us in this life. Science is exploring outer space. What is out there, and how will it affect us here on earth? Science is exploring the world of the microbes. What causes cancer, and how can we cure it? The answers to these questions can be obtained only by probing and exploring. The artist is searching for his relationship to the world. He is searching, as the scientist is, for order in an ostensibly disordered universe. His painting reflects the vital exploratory, restless, reflective interpretation of his own meaning in the world. The world, which seems extremely chaotic, contains tremendous constructive and integrative forces. But modern life has fragmented man. It has split the mind or soul of man from the rest of

himself.

Man is becoming very much like the machine which he has created, but deep within this "machine" is an aching, empty, frustrated soul, sometimes filled with a pent-up violence, or on the other hand a pent-up tenderness and love. The kind of inner experience varies with individuals but seems universally enormous in intensity. Man often feels that if he displays his deepest feeling, he will lose the dignity which a "machine" should have. The artist feels this inner being more strongly and is especially sensitive to the loneliness which comes from the inability to express completely his many and complex emotions and reactions about his world. The creative artist, like the creative scientist, is a restless individual and is never easily satisfied. He needs to reach out and fill this void within himself which is partially caused by the emptiness which prevails in present day man in this time of mechanization. The artist often searches into the primitive past for his expression, perhaps as a rebuff against growing industrialization and the commerciality and artificiality of the present world. Some artists are looking for new and dynamic ways to create their feelings about this time of transition. In his search for new forms and new methods of expression the artist may use materials which modern science has produced.

The scientist and the artist are often lonely in their struggle.

Science has shown us that there is more than this visible world to be explored. An exciting new world was opened to us by Leeuwenhoek over

two hundred and fifty years ago. This is a world that I have had the good fortune to investigate. The microscope has revealed to us part of the misty unknown which surrounds all mankind. This world of the microbe is populated with a thousand different kinds of beings, of many shapes, sizes and colors. Some of them are ferocious and deadly, others are friendly and useful. Leeuwenhoek, a janitor turned scientist, through his constant probing and experimenting, peered through his handmade microscope into a fantasic sub-visible world of tiny creatures who had lived, bred, battled and died, completely hidden from and unknown to all men from the beginning of time. These very creatures are capable of annihilating whole races of men ten million times larger than they are themselves. This sub-visible world is a source of rich visual material for the artist; it lends itself to fathomless inspirations and wonderings.

One of the strangest sights I have ever witnessed was seen when I had the occasion to work in virology research one summer as a research technician. We prepared living tissue cultures from every type of tissue, from the Amnion, which is a layer of tissue which covers the uterus, to bone tissue. Planting this tissue inside test tubes, we kept it bathed in a salt-balanced medium which is necessary to maintain life. We kept these test tubes in an incubator which approximated the temperature of a normal human being. Each day we checked the tissue microscopically to see how it had progressed in growth. The cells were still living and multiplying, even after having been separated from their normal environment.

Their growth had spread along the sides of the tubes!

The most interesting experiment in which I became involved was one in which we ground up the hearts of mice, using a mortar and pestle. We planted the contractile tissue inside the test tubes and treated it as previously described. After three weeks, this mutilated heart tissue had spread in its growth and was still pulsating. Scanning the tissue microscopically one could see various clumps pulsating with life . . . each with a different rhythm. The scientists with whom I was working tried to explain this phenomenon by describing the biochemical nature of contractile tissue, but they were as amazed as I was. This is just another of the many unsolved mysteries which are waiting to be explored.

Science and art each give only partial answers to the truth about life and they give these answers in different ways. For example, when an artist, and a scientist, are standing together looking at the ocean, the scientist upon being asked, "What is the ocean?" may say, "the ocean is largely made up of salt, and its water contains hydrogen and oxygen and each drop contains trillions of atoms." The scientist will seek to prove this by evaporating the water and showing the salt crystals which remain. He will then run a galvanic current through the water and show the division of the water into hydrogen and oxygen, and so on. By these experiments the scientist is certain he has convinced the layman of what the ocean really is, but has he? The artist would probably say, "But the ocean seems to be far more than that to me!" The artist wonders.

He realizes that there is something more involved. There is something missing in the scientist's definition which leaves the artist with an emptiness resulting from the failure of the scientist to grasp the whole reality of the ocean.

Why is it the artist can feel the life of the ocean and penetrate its fullness until he is at one with the surging, moving, restlessness of it in its entirety? This is something which defies breaking down into scientific formulas. The artist feels this mysterious relationship which exists between him and something in that ocean . . . so he paints.

The scientist, through his explorations, has made some marvelous transformations in our lives. He has uncovered much of the mystery which surrounds us. He has gained much knowledge through his research; but through his creation, he has brought us to the brink of destruction. We are confronted by the tragic irony that while we have been highly successful in expanding the boundaries of knowledge, we have threatened the continued existence of life on this planet. We are now faced with the realization that man's brain can create things which his will may not be able to control. The power of creation has unveiled the power of destruction. We, as human beings, have the choice to create or destroy. Almost any discovery can be used for creative <u>or</u> destructive purposes. The German dye industry was not created to deal with either medicine or weapons of war; and yet out of that industry came our sulfa drugs and mustard gas. When Einstein wrote his famous transformation equation in

1905 he was not thinking of the atomic bomb, but out of that equation came one of the principles upon which the bomb was based.

The good and evil which flow from scientific research are more often than not indistinguishable at the point of origin. Generally they are by-products, or they represent distortions of original purpose, none of which could have been foreseen when the initial discovery was made. Science has given us radar, jet propulsion, satellites, rockets and power sources of unprecedented magnitude. It is our choice to either use these constructively to increase the happiness of mankind or to employ them to destroy the world completely. Many of the scientists who were connected with the creation of the atomic bomb have publicly expressed their apprehension of the consequences of their own creation. They had a momentary feeling of elation when their experiment met with success; but that feeling changed to one of complete horror when they realized the destructive power they had unleashed.

Science has created this monster which has made war more terrible. It has brought us to the doorstep of doom. Science is not solely responsible for this tragic situation, because in a way science reflects the social forces by which it is surrounded. When there is peace, science is constructive; when there is a hint of war, science is perverted to destructive ends.

CHAPTER III

RELATED PAINTINGS

My interest in the mysteries of the unseen and the unknown manifests itself in my paintings. I will endeavor to discuss the nature of this manifestation, knowing well that the paintings can more truthfully speak for themselves. Paint is one medium of expression and words are another.

My experimentation with materials which best suited my expression resulted in the use of metal and wood veneer. The metal consisted of stamped out pieces of various sizes and shapes. I used contact cement and water putty, not only to secure the wood and metal to the Upson board, which I used for the foundation, but to produce the desired textural effects as well. I painted over this in most cases with oil paint.

When I am looking at my paintings, I am reminded of the microscopic and submicroscopic world of textures with which I have been closely associated. On the other hand, I sometimes get the feeling of molecular distribution or on a much larger scale it could have something to do with the solar system and its whirling planets. I am reminded of the similarity between the structures of the atom and the solar system, as the structure of the atom is analogous to that of the solar system. In its inconceivably minute center, less than a trillionth of a centimeter in radius, is a relatively

gigantic "sun," the atom's nucleus. Around this atomic "sun" revolve tiny "planets" in definite preordained orbits, with the same regularity and obedience to immutable laws as our earth and the other planets revolve around our sun.

Whether it is macrocosm or microcosm with which I am more involved, I am not sure. I do know that I, along with the rest of the world, am very much concerned with the threat of nuclear warfare and the radioactive fall-out from nuclear tests, an invisible menace which surrounds us daily. I am constantly wondering about destruction and death. This is more of the unknown with its mystery. My expression is the result of all my concerns. The mystery of the unseen and unexplored worlds fascinates me. This sense of mystery manifests itself in some of my paintings as a kind of misty veil which partially hides the forms underneath. It seems unreal, yet it is there, just as radioactive particles and viruses cannot be seen with the naked eye, yet they exist.

I feel very fortunate to have been associated so closely with science and art. Science not only serves a new knowledge for its own sake but it has given me so much insight into the patterns and structures of life with its order in apparent disorder; its unity in variety. Likewise, my art has made me far more perceptive in my scientific work. I have seen what I ordinarily would not have seen had I never studied art.

Following is a very brief discussion of some of my paintings:

1. "Cold War"

This is the first painting in which I realized my direction. I had hit on something. I realized for the first time the feeling I wanted to express. This is a rather dramatic painting. It is as if an arm of earth had shoved this white rock-shaped element away from the earth itself and has it precariously balanced.

It reminds me of a hovering between one thing and another; either a hovering between earth and space or between war and peace. The shapes and colors are more definite and clearly defined in this painting than they are in the others.

2. Untitled

This has definite rock-like forms which could be part of the earth or part of the space above it. The off-white shapes are partially veiled by a grayish yellow mist which gives a feeling of mystery or vagueness. There is still this feeling of hovering between one thing and another -- though this seems to be more a part of the earth, especially the shapes at the right bottom of the painting. They are more firmly imbedded in the reddish earth. The form at the middle left seems to be on the verge of floating into space. This is my first attempt at using metal for expression. The metal is in the form of iron filings which add the needed texture.

3. Untitled

This painting is the first one in which I used wood veneer. There is also an iron gear which is the central point of the painting. It seems to be an explosion of some sort, whether in space or on earth. I feel sure that this is the result of my great concern over nuclear warfare.

4. "Southern Converting"

This painting is one in which I feel that I have reached my most complete expression. It is more a part of me than any I have done before or since.

It consists of stamped out metal pieces and an iron spring which is the central point of the painting. The spring gives the appearance of a great magnification of one small area of the painting.

5. "Lunar"

This painting suggests an otherwise peaceful moon being bombarded from the chaotic earth with flying debris. Notice the proximity of the moon to the earth. This gives an overall feeling of uneasiness found in destruction by mankind.

6. "Composition of the Between"

This has a gloomy sereneness about it. It is mysterious in its vagueness. It could be the aftermath of

the nuclear war or the conquering of space. Everything in space and on earth is dead. There is a gloom over all. There is no motion; it is as if everything was burned out. It has the same feeling as painting no. 2, though painting no. 2 is happier in its serenity and offers more hope with its floating feeling. This painting has a nailed down feeling of finality.

7. "Tangent of Theta"

This painting gives a feeling of almost complete destruction and despair -- I said "almost," because there is still one ray of hope in the moving, swirling figure in the left bottom corner. This could be outer space, on the earth, or under the microscope.

8. "Fall-out No. I"

The large and small shape are made of wood veneer. The textured grass-like quality was created with a mixture of water putty and Formica Contact cement. Oil paint was used over this.

This painting could possibly involve the contact and intermingling of the visible and invisible: the visible being the world as it is seen by the naked eye; the invisible being the radioactive particles which surround us and are not felt or seen.

9. Untitled

Three round metal objects were used in this painting. They are surrounded by smaller metal pieces which seem to be whirling chaotically around the large ones. I do not feel that this painting is successful. It suited my expression at the moment it was created, but it no longer holds my interest. It is a surface statement.

10. Untitled

The basic construction of this painting is quite similar to the others, in that metal pieces were used with water putty and contact cement to produce texture as well as functioning to hold the metal to the Upson board. The colors produce a mysterious effect. It has a quality of "other-worldliness."

11. Untitled

The textural effect in this painting was achieved with the aid of water putty combined with contact cement. There is a haziness as earth forms seem to be covered with a veil of mist.

12. "Viaticum"

This painting has a mystery connected with it though a different kind from the others. This has the feeling of being on the edge of death, a hovering between life and death.

13. "Composition Debris"

This painting captures a feeling of destruction of nature by mankind with all of his industrial debris.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Anderson, Donald M. Elements of Design. New York: Holt, Rinehart and Winston, 1961.

2. Baur, John I. H. Nature in Abstraction. New York: published for the Whitney Museum of American Art by the MacMillan Company, 1958.

3. Brown, Harcourt. Science and the Creative Spirit. Toronto: University of Toronto Press, 1958.

4. Hardin, Garrett. Nature and Man's Fate. New York and Toronto: Rinehart & Co., Inc., 1959.

5. Leepa, Allen. The Challenge of Modern Art. New York: The Beechhurst Press, 1949.

6. Nahm, Milton C. The Artist as Creator. Baltimore: The John Hopkins Press, 1956.

7. Rader, Melvin. A Modern Book of Esthetics. New York: Holt, Rinehart and Winston, Inc., 1960.

8. Rothschild, Richard. Paradoxy. New York: Richard R. Smith, Inc., 1930.

9. Shapley, Harlow. A Treasury of Science. New York: Harper and Brothers Publishers, 1958.

10. Smith, Paul. Creativity. New York: Hastings House Publishers, 1959.

11. Von Weizsäcker, C. F. The History of Nature. Chicago: The University of Chicago Press, 1949.

Typed by

Marie Teague