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## A Study of the Creative Use of Discarded Light Metal for the Secondary School Art Program

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A STUDY OF THE CREATIVE USE OF DISCARDED LIGHT METAL  
FOR THE SECONDARY SCHOOL ART PROGRAM

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A Thesis  
Presented to  
the Graduate Faculty  
Central Washington College of Education

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Education

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by  
Alma Eastwood McConnell

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## CHAPTER I

### INTRODUCTION

The most important responsibility of the art educator is to stimulate and encourage individual creative expression. In order to do this he must constantly be on the alert for new ideas and new methods for providing practical experiences which will develop the student and help him to maintain an active interest in achieving growth in creative ability.

During the last two decades a new art form, metal sculpture, has been developing. This new art form has gained recognition as a valid medium of creative expression and examples of metal sculpture are to be seen in many of the world's leading museums. This is a natural evolution, for just as civilizations of the past have reflected their cultures through art, so does the use of metal as an art medium reflect the culture of the technological age in which we now live.

The appearance of this new art form presents a challenge to the art educator--the challenge of finding ways in which he may provide experiences with metal in his classes. The following study is the result of an

attempt to meet this challenge and is presented with the hope that the findings will make a contribution which will further enrich the program of art education.

## CHAPTER II

### DESCRIPTION OF THE STUDY

#### I. STATEMENT OF THE PROBLEM

Although there are numerous references as to the values in the use of light metals in secondary school Art Curriculum Guides, there is a scarcity of material describing a practical, simplified process which could be used in an art classroom.

In the past the only experience with metal work has been presented to the student in the industrial arts program. Now that metal sculpture has become a recognized art form, some opportunity for work with this medium properly belongs in the school art class. A readily available source of supply for light metal material is discarded metal containers. After the sheets of tin have been cut away from the can rims and flattened out, only initiative and imaginative ideas are necessary for creative results.

The problem which has been dealt with in this study has been to adapt to creative expression this waste metal from cans, using only the most simplified processes.

## II. LIMITATIONS OF THE STUDY

For the purposes of this study all of the work has been approached from an hypothetical viewpoint of the student in the secondary school art class. The foremost objective has been that of determining whether or not students could profit from working with this readily available light metal.

Realizing that there are many schools which have no especially equipped shop facilities where more advanced work might be done in industrial metals, the writer has deliberately attempted only such projects as might be carried on in any classroom.

The writer has also limited his work to projects which could be accomplished with tools which might be found in any home--tin snips and pliers. The only materials necessary to explore simplified metalcraft with successful results, are light metal from discarded containers and wire coathangers.

All of the work in the study was done by the method of direct application of the tools to the medium. The metal was approached with the tin snips in much the same way in which paper is approached with scissors. The

difference is that metal offers resistance which presents a greater challenge to the student. The direct method of working allows for great freedom of expression.

Since little published material is available, all of the examples in the study are original efforts resulting from a desire to use light metal in as many ways as possible. Further handling along a particular line would develop skill and perfection in the execution of imaginative and creative designs.

This study has in no way attempted to develop all of the possibilities in working with discarded metal. The objective has been to present some suggestions and ways in which this medium might be used to the advantage of both the teacher and the student.

### III. IMPORTANCE OF THE STUDY

Prominent art educators recognize the values in a variety of media and processes in the school art program. A comprehensive program will provide for flexibility which will permit individual expression. Metal-working processes are recommended as a constructive activity which aids in the development of resourcefulness.

Mendelowitz, who is a recognized authority in art education, writes:

Many boys who are not interested in simple types of activities are challenged by metal and metal-working processes (1:66).

Doing things with waste products is a valuable and worthwhile challenge to the imagination. It can develop the valuable qualities of ingenuity and resourcefulness in a child (1:67).

Individuals who prefer the craftsmanlike approach to artistic expression usually are satisfied by oils, tempera, pen and ink, the print process, carving in wood and stone, and working with metal, plastics, and other types of synthetics (1:107).

Just as uninhibited and vigorous experimentation with a medium will develop boldness and freedom, so a controlled craftsmanlike procedure also creates its particular capabilities. Working in a methodical and careful way trains one to develop great precision, and enables the artist to execute involved and highly formalized design concepts and to include a tremendous amount of detail in a finished piece of work.

If a child appears to be working against his natural bent because of the influence of some teacher or friend, a change can frequently be stimulated by introducing the child to a new medium which will demand a different approach (1:107).

Lynch, an author and professional sculptor in metal, states:

In this age of mass production and "disposables", it seems not only dull but anachronistic to emphasize technique to the exclusion of happy inspiration and improvisation (2:25).

If metals are scarce in your particular neighborhood, you might make a practice of collecting such stray pieces as you might come across from time to time. Cans from the kitchen or gallon cans that have served their purpose as containers for gasoline or other liquids are useful for many projects (2:29).

Frederick M. Logan, Art Educator at the University of Wisconsin states:

No one is apt to believe that the one way to expressive competence has been marked out for all students. That a variety of routes has been proposed and tried out with considerable success is what art teachers can observe. The public-school art teacher, the art faculty of the humanities college and the teachers' college, the teacher of general art-education courses in the university--these are the people who will make what use they can of these methods and who will avoid fixed routines and the unthinking repetitions which make any "system" a straitjacket (3:262).

Beyond the confines of the general art course for all interested students, we may expect to see in the future an expansion of special craft classes in the medium-sized and larger high schools. There is evident a nation-wide desire for more art craftwork on the part of high-school students, which has for some years been deliberately held down because of lack of space (3:287).

Lowenfeld, a national authority in the field of art education, recommends the use of "wire and sheet metal" as a medium for art expression (4:331).

Victor D'Amico is director of the Peoples Art Center, Museum of Modern Art, and an Instructor in Fine Arts, Teachers College, Columbia University. He recognizes the importance of three dimensional expression:

Constructions are a natural form medium for the art student. Teachers are coming to recognize more and more the importance of form media which children and young people can manipulate directly and easily. A growing interest in construction has been observed,

and it has been definitely established that many students respond more readily to form media than to flat media (5:193).

At the senior high school level, constructions call forth a high degree of invention and craftsmanship from the individual (5:200).

In addition to the above statements, the writer feels that there are some additional advantages in working with light metal.

There are many ways in which work with light metal can produce objects of aesthetic quality and develop in the student an awareness of and an appreciation for other objects of aesthetic quality. This medium offers possibilities for bridging the gap between arts and crafts by combining sound principles of art with craft techniques.

Since waste metal from discarded containers is light and may be easily cut, bent, or pounded for texture, it has many advantages over expensive, heavier commercial metal in handling facility.

An error in the execution of a project could be discounted and a new beginning made because of the abundant supply of discarded light metal. This would become an important factor in encouraging the student to work freely.

An important consideration for some schools would be the reduction of costs of materials and tools.



## CHAPTER III

### THE CONTRIBUTION OF THE METAL CRAFTSMAN IN HISTORY

The earliest records of civilization relate how the craftsman was an important member of every living group. The imagination of primitive man prompted him to devise ways in which he might create the utilitarian objects needed in his daily life. Primitive man, in observing how water collected in rock depressions and in the sun-baked crevices of the earth, was motivated to fashion objects with similar utilitarian properties. The most easily used substance at hand was soil and this became his natural medium. The primitive man who first fashioned a crude bowl from clay was civilization's first craftsman.

These same early records were written by craftsmen, in the form of picture stories which were etched into rocks. This form of documentation, known as hieroglyphics, is defined by the Greek words, *hiros*--meaning sacred, and *glyphein*--meaning to carve. This substantiates the interpretation that many of the early recordings were of religious events, executed by the primitive craftsman in homage to his Gods. Much of our information about early civilizations has been acquired from the records left in rock pictures by the primitive craftsman.

The term, craftsman, applied to anyone who "made" something. As the craftsman became more adept and skilled in his work he was designated as an artisan in recognition of his proficiency. The artisan was limited to only those materials which were native to his environment. The product of the craftsman and artisan are known as artifacts. This term comes from the latin words, artis--art and facere--to make. Archeologists, from their studies of artifacts, have determined that some of the earliest art forms are from the Paleolithic or Stone Age period which dates back to 50,000 B.C. (6:10).

For the purposes of this study the investigation has been limited to the development of one craft--that of metalwork. To better understand the position held today in art by the metal-craftsman, it is enlightening to know that metal has always been an important medium for art expression.

Gardner (6:13) writes that, "The first appearance of the use of metal in the arts was about 10,000 B.C. These first metals were gold and silver, which occur native, or free, in nature. This is due to their permanance in withstanding exposure to weather. From evidence it can be assumed that these metals were "accidentally discovered by

primitive man as the molten drops separated from the rocks in his campfire in Sinai" (6:18). This simple observance was the birth of metallurgy and chemistry. Without metals, many people believe that modern civilization would not have developed (7:4414).

Since gold and silver were present in natural form and in great abundance, these metals were used lavishly in the crafts of the early Egyptians. Artifacts reveal the magnificence and richness of the period. An unearthed ceremonial vase discloses a wooden core entirely encased in hammered gold and inlayed with lapis lazuli (6:38). Copper, which also occurs in natural form was used by the Sumerians (4000-1925 B.C.) and products of this era reveal an understanding of various processes of working it. They cast small figures in it; they beat it into thin plates for sheathing beams and columns not only to protect the underlying material but also to secure its color and texture for decorative purposes (6:82).

The metalworker was important in Greek Art and his works reflect the general style of the day (700 B.C.). By this time, bronze had been developed and become a favorite medium with the Greeks who used it widely for sculpture but also for various kinds of utensils: pots, pans, dishes

for the table, sacrificial vessels, tools, weapons. The Romans of this same period also used a great deal of bronze. Many utilitarian objects made from this metal were found in the ruins of Pompeii when they were excavated in the 18th century (7:Vol.13.5722). Lavish gold and silver jewelry, set with precious stones, was uncovered at Pompeii and may now be seen at the National Museum at Naples.

The coming of Christianity brought with it the greatest challenge yet for the metal craftsman; the building of churches and cathedrals brought demands for lavish appointments and furnishings. In addition to elaborate gold and silver ornamentation and equipment, metal grillwork became important as a decorative medium. Iron was used with highly artistic results during the 13th century when Gothic art reached a peak (6:331).

The Renaissance ushered in a fresh new attitude toward life which was expressed in greater freedom of thought. This was an era of scientific research and development. The invention of the printing press in the middle of the 15th century and the voyages of Marco Polo and Columbus brought about a wider knowledge of geography, colonization, and expansion of commerce with the greater

wealth that followed. Art became a matter of civic pride and the artist and craftsman were in great demand. There was a noticeable departure in the arts from medieval tradition and greater ornamentation and extravagance appeared.

Early in this period the status of the craftsman began to change as demands for art objects and decoration grew. The artist of the Renaissance was not a specialist in any field, but could be called upon to model a piece of sculpture or paint a picture as well as fashion a piece of jewelry. Previous to this time the term, "artist," designated one who painted, while "craftsman" was used to identify those working in three-dimensional media. The title, "artist," expanded to indicate proficiency and skill in all phases of creative expression, and the artist's shop became the center to which a patron would go to consult and to place an order. This great versatility in an artist was accomplished through an apprentice system. A boy of ten or twelve years would enter the shop of an artist where he would understudy his employer and spend his time grinding colors, preparing wood for carving or, as he gained experience, be allowed to assist on major works. When the youth became proficient in all phases of

art work, he would usually leave the master's shop to set up one of his own. In this manner an artist became a craftsman and the craftsman became an artist.

Gardner reported that:

A feature of Renaissance architecture which was both functional and decorative, merits more than passing attention--the wrought-iron work. The strength of the metal made it valuable for grilles and gates where strong protection and at the same time, light and air were needed. Technically, it could be worked by several processes, for it could be hammered, molded, welded, carved, chased and stamped. The necessary tools were few and simple--a forge, hammer and anvil, tongs and chisels. An important fact in designing in this medium was the fact that the metal must be worked quickly. Hence, vitality and breadth controlled successful design, though the chased ornament could be added later. This harmony of material, process, and design is well demonstrated in the gates, grilles, standard-holders, and lanterns of the palaces (6:347).

Recognized authorities feel that the metalworker attained his highest skill in Spain during the 16th century, where gold, silver, and iron were in abundant supply. An outstanding example of technical perfection may be seen in the Cordoba Custodia, a golden shrine which houses the sacraments. The Custodia is all design and decoration but it is done with such skill as to give a fairy-like appearance to the vessel. Another example of the perfection of the Spanish metalworker is seen in the Reja of the Seville Cathedral (1520). In this work the

artist achieved his highest peak. The Reja is a shield for the altar enclosure and protects the treasures within while leaving them visible. The Reja displays delicate handling of iron as the medium and the entire effect is one of a fine balance of architectural horizontals and verticals (6:465). The creators of such iron grilles were sculptors and architects as well as craftsmen.

With the advent of Protestantism, in 1859, many monestaries and churches were destroyed in England and art patronage ceased. England lost many of her skilled craftsmen. The industrial revolution, which subsequently developed, introduced the manufactured product which began to replace the hand-made article. Art began to be looked upon as a luxury and something in which only the wealthy might indulge. As a result of this curtailment, public taste declined and very little evidence of creative expression was present in England during the latter seventeenth and eighteenth centuries (6:490).

Thus far, the writer has dealt with the contribution made by the metal craftsman to European art. Of no less importance is a consideration of the art of the Orient, for Asia is generally regarded as the cradle of the human race. As European conquest opened up this vast area, some of the oldest monuments in the world were revealed. It is

believed that the Aryan race, the dominant race of Europe and consequently of America, had its origin in southwestern Asia (7:446).

The people of India have always been greatly diversified in language and culture and have never achieved unity in government, but nowhere did spiritual significance take greater precedence. The Hindu craftsman was an important member of Indian society and he and his family resided in the homes of the wealthy in order to provide jewelry and rich trappings for the nobility. His sons worked with him and carried on the tradition through succeeding generations. Jewelry has always been an important part of the Indian costume. Indian metalcraft reflects the value of the pure metal enhanced by superior craftsmanship, and much of it is unadorned with precious stones (6:599).

Farther east, in China and Japan, the fundamental traditions have been preserved for over four thousand years. Since early Chinese culture climaxed in the Chou dynasty of 1100 B.C., the best in creative expression has been found to be in the works of that period. One of the earliest and most characteristic expressions of the Chinese race was bronze work in the form of ceremonial vessels used in their rites for ancestor worship.



Gardner (6:626) has recorded that the finest craftwork belongs to the early Chou period and designs from that era have become traditional and have been reproduced in jade and other media. In the neighboring country of Japan the strong influence of Chinese art has been conceded (6:628). Here also, bronze was the dominant medium, and Buddahs and adornments for shrines were supplied by the Japanese metalworker with integrity and skill.

All of the cultures of the world have had some remote and indirect influence upon the culture of America. The early settlers who migrated to this new world were products of all cultures of Europe and Asia as succeeding generations had left their contributions to the development of mankind.

During the earliest days of colonization in America, art was neither an influence nor a remunerative field of endeavor. The early settlers were intent upon establishing homes and providing the necessities of life. The activity of the metal craftsman was confined to the more mundane pursuit of creating plow-shares and horseshoes. During the long years preceding the Revolutionary war, the only crafts of importance were the crafts of the home. An artisan might have been located in the centers of population, but such men were in extreme minority. One

metal craftsman, Paul Revere, played an important part in the Revolution. His name has come down through history not only as a patriot, but as an exceptionally fine engraver and silversmith (7:Vol.14.6069).

America's restless struggle to establish democracy precluded concentration on cultural development. When peace finally came, late in the eighteenth century, the country was exhausted both physically and economically. Logan (3:2) writes that our first fifty years as a nation were cramped by warfare, financial problems, industrial shortcomings, and primitive communications and travel facilities. True, works of art were being produced and there were some art teachers; but the interest was shared by scant few, the achievements being scattered and not too encouraging to the artist.

It was not until the turn of the eighteenth century and early in the nineteenth that the artist took his rightful place in the sociological structure of the new country. Even then, the influence of the artist was that which was brought to this country from Europe. Logan says:

The chief difference between Europe and America was the number and proportion of people here who believed they had a vested interest in the good things of life. If the visual and plastic arts were valuable,

then everyone here assumed that they, or anyone especially interested, should have access to them (3:43).

Concurrently in America there was a growing conviction that the arts must face forward rather than backward, and that we must evolve our own forms of expression based upon our own social organization. While the art of Greece in Plato's time may be valid today as representing that particular period, so must the art of the new world be an interpretation of our own social philosophy.

The influences of the German Bauhaus, which grew out of the industrial revolution in Europe, were widely felt; and it was inevitable that this emphasis was to be strongly felt in America. Reflecting our own growing industrialization, many new art forms and media emerged-- first as experimental techniques which later were accepted as powerful creative expression.

Gardner (6:746) recognizing that industrial art is a dominant factor in modern America, believes that the industrial designer is the key to this country's new expression. The appearance of metal as a medium of artistic expression gives validity to the philosophy that art simply repeats the pattern of life in any culture. The growing interest in metal sculpture is compatible with the technology of today.

## CHAPTER IV

### THE USE OF METAL AS A CONTEMPORARY ART FORM

Thirty years ago the word, sculpture, brought to mind visions of classical Greek statues. Modern sculpture, like modern architecture, was thought to be the collective whim of a handful of individuals eager for innovation. Now the scene has changed. A modern sculpture has emerged, based upon present-day economic, social, and aesthetic standards. This modern sculpture is being incorporated into our equally modern architecture and absorbed into our culture (8:1).

Prior to the first decade of the twentieth century, Europe was the fountainhead of all sculpture and followed, closely, classical tradition. By 1900, European sculpture which continued to establish patterns which American sculpture followed, was beginning to break with the formal tradition of the past. A major change was brought about by the growing conviction that a statue, to be true sculpture, had to be conceived directly in its final material and thus be imbued with the essential properties and qualities of the material. This direct handling of material brought about clean-cut, rhythmical outlines and simplified forms which, though suggestive of the subject matter employed,

were so shaped as to be aesthetically pleasing in themselves and sculpturally sound in design (8:12).

The ultimate result of direct handling of materials was an increased respect for all materials and a desire on the part of the sculptor to explore new media. In writing about modern sculpture, Schnier reports:

For thousands of years the list of available sculptural materials remained unchanged. There were few materials used by sculptors at the end of the nineteenth century that were not known in Rome of Augustus' reign.

But today, countless new and improved materials for modern sculpture have been made available, the result of research by chemists, physicists, and metallurgists. From the investigations of these men come the materials most characteristic of our time--new materials for which the progressive sculptor finds appropriate forms and effective application (8:37).

During the past twenty-five years there has been evidence of a completely new form of creative expression--the interpretation of sculptural form by direct handling of metal. In many of America's leading museums today, metal sculpture is given an important place. Whatever the reasons may be for the present enthusiasm for metal sculpture, it remains a fact that this new art form is being adopted and enjoyed by increasing numbers of serious artists. John Lynch, a successful sculptor in metal has this to say:

Among the more mundane or practical reasons for the growth of metal sculpture into a major art form are: our typically American delight in machinery and the casual ease with which we accept the industrial world and its products; the amazing amount of information which the average man has about tools, materials, and techniques of all kinds; our willingness to accept new things and our absolute relish for startling changes (2:7).

Three influences have contributed to the development of metal sculpture as it exists today: first, the Cubist analysis of form, which broke with the realism tradition; second, the experiments of the extremist "Dadist" group, whose artists used "found objects" to shock a conservative public; and third, the ever increasing variety of tools, materials and techniques developed for industrial uses which sculptors have adopted in their continued search for new forms and new methods of expression (2:12).

In justifying the departure from the traditional in sculptural forms, Schnier gives a logical view:

When architecture is nontraditional, nonderivative of historical styles, sculpture tends to be non-derivative. When architectural forms result from a recognition of function, a respect for materials, the application of design principles, and a reflection of the politico-social system of the times, sculpture forms follow suit. It is under these circumstances that many of the sculptural styles of the past have evolved. It is also partly under the influence of similar circumstances prevailing in the field of present-day architecture that modern sculpture has evolved (8:14).

The artist of the technological age reflects the culture of the age through the imaginative use of modern materials. Lynch believes that every artist carries a responsibility:

It is the business of the artist to constantly re-interpret the world for his fellowmen, so that the ordinary stuff of life re-emerges fresh and exciting from the welter of utilitarian, sordid, or dull uses to which it has been put. For our time metal sculptors have assumed this wizard role, and we have come a long way since the beginnings. Contemporary sculptors have recourse to a sign language that reworks the familiar bronze and marble formulas into a compressed symbology which the average man of the twentieth century, interested in art, can interpret to his own satisfaction (2:18).

Constructivism is the term used to identify the non-objective art expression which employs tactile materials in manifestations of interrelated and interpenetrating spaces. These constructions carry light and shadow within themselves. One theory suggests that constructivism springs from science, but Schaefer-Simmern disagrees (9:8). He feels that if this were true it would be logical to assume that the visual representation of an algebraic formula would be an apt problem for the art of sculpture. Schaefer-Simmern holds that a work of "concrete" art is the realization of an idea, whereas a mathematical formula is of an impersonal nature; abstract art provides an outlet for individual expression and feeling. Whatever may have been the forces involved in the stimulation of modern sculptural forms, the fact remains that they convey vitality, strength, and imagination.

Constructivism is said to have originated in Europe as an extension of cubism by Picasso in his relief compositions. These constructions led to arrangements that could be suspended by wires or mounted on pedestals and were composed of many new industrial materials: glass, wire, sheet metal.

Picasso's fantasies in wire and sheet metal may have influenced his friend and fellow-countryman, Julio Gonzales; but since Gonzales, the practiced metal-worker, is known to have instructed Picasso in some of the techniques of his craft, perhaps the exchange was equal (10:30). Gonzales was the son of a master goldsmith and was instructed in metal-working from childhood. His amazingly sensitive figures are among the most original contributions to twentieth-century sculpture. The Museum of Modern Art, in 1936, was the first museum in America and probably the first in the world, to acquire one of his sculptures. He worked in the abstract as well as in a comparatively realistic style. HEAD, shown in Figure 1, is an example of Gonzales' delicate command of intricate relations between mass and space. It is possible that Gonzales, not only through his own work but also through his influence on Picasso's constructions, has been largely



FIGURE I

HEAD (1936)

Julio Gonzales  
Wrought Iron  
Museum of Modern Art



instrumental in popularizing the use of metals by many of the younger sculptors of today (10:30).

The American sculptor whose style is most closely linked with that of the European constructivists is Alexander Calder. He was educated as an engineer but his imagination led him to create dangling, moving forms which, when assembled and suspended into space, resulted in a form of oscillating sculpture which later became known as mobiles. His interest in composition stressing nontraditional materials was first expressed in representational primitive forms but now has arrived at complete abstraction. Calder's characteristic medium is metal, especially in flat form, which he handles by cutting, shaping with a hammer, or assembling piece by piece.

Calder made his first mobiles twenty-five years ago, but not until the forties did his work begin to be noticed by critics. His greatest recognition came in 1950 when the Massachusetts Institute of Technology honored the engineer-turned-artist with an invitation to show his work. Since that time Calder has achieved worldwide recognition and while his work has been an inspiration to followers, no one has as yet surpassed him. In LOBSTER TRAP AND FISH TAIL, shown in Figure 2, the delicate grace and precision of pure line in the fine

FIGURE 2

LOBSTER TRAP AND FISH TAIL (1939)

Alexander Calder  
Steel wire and sheet aluminum  
Museum of Modern Art



steel wires contrasts and combines in constantly changing relationships with the bold dash and vigor of the aluminum shapes.

To the person who thinks of sculptural form only in terms of stone and massiveness, the light, flat, or attenuated metal forms in the mobiles or stabiles of Calder, and other sculptors working in the same idiom, will seem unstable, thin, restless, and dangerous. Actually, metals in general have structural and textural properties quite distinct from those of stone or wood.<sup>1</sup> It is only when the properties of metal are exploited to the fullest that a sculptor achieves the most expression of his idea.

The organic abstract tradition which is followed by a group of young sculptors is chiefly preoccupied with the solidity of volumes and, even when these are perforated, the perforations are used to emphasize still further the substantial nature of the remaining mass. Space, in this conception of form is in a sense a negative factor. Space takes on reality, is created in fact only by the presence of form. The constructivist tradition, on the other hand, has emphasized the positiveness of

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<sup>1</sup>Photographs of original sculpture, created by the writer, in wood and stone, are to be found in the Appendix.

space and in its most advanced manifestation has reduced the substantial or formal aspect to a minimum and has, in effect, drawn in space rather than modeled or carved in materials (10:35).

In addition to the use of sheet metal, some of the younger generation of constructivists, however, have turned to wire; for example, the Americans Lippold and Lassaw. Richard Lippold's VARIATION NO. 7: FULL MOON (Museum of Modern Art), his masterpiece, is a lyrical, astronomical, linear music that makes earlier abstractions almost weighty by comparison. If Lippold's is an almost rococo resolution of the constructivist's music of the spheres, Ibram Lassaw's MONOCEROS (Kootz Gallery, N. Y.) is its baroque counterpart. Like a fugue it rises architecturally, cube on cube, to a splendid resolution (10:36).

Even so, however refined and graceful the works of these younger constructivists are, some viewers miss a quality of passion, and sense a lack of human involvement that seems to express a strange aloofness in the face of the political and emotional turmoil of today. Perhaps they might answer in defense that detachment is the only antidote to chaos (10:36)?

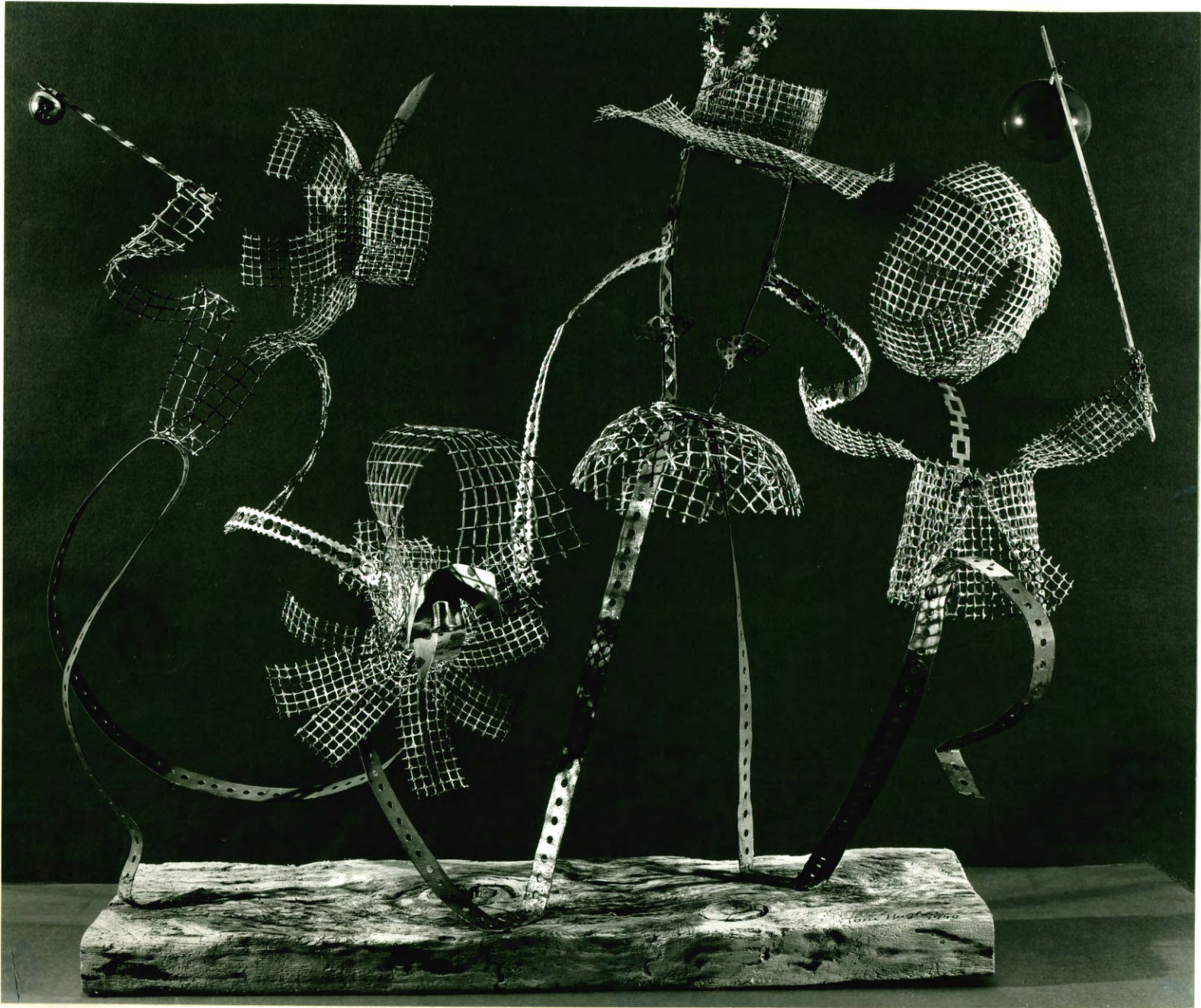
A pure construction of a different mood is shown in Figure 3. Toni Hughs' CHILDREN ON THE BEACH is simply

FIGURE 3

CHILDREN ON THE BEACH (1940)

Toni Hughs  
Plumber's iron and wire screening  
Museum of Modern Art, New York





made of plumber's hanger iron and galvanized wire screening, yet it has so successfully translated the feeling of light-hearted gaiety that it has been purchased by the Museum of Modern Art.

It is in America that the most vital wing of this new sculpture has appeared. No other single country since the war has produced such a large group of fresh and internationally significant talent. David Smith, before the war, announced himself as one of the most promising sculptors in this country. He has since fulfilled that promise, and with energy and an imaginative grasp of his material, wrought iron and steel, he has produced a body of sculpture that is of great importance. Using the surrealist method of metaphor, he has drawn in metal a richer and more varied set of images than any other sculptor of his generation. He is by no means always successful in his valiant struggle with his material, but when he is, the result as in *BANQUET* (Willard Gallery, New York) is a triumphant justification of all his labor. Silhouetted against the sky, as they should be seen, these hieroglyphs in space have a clarity and finality that only a powerful imagination can achieve. He is an admirer of Gonzales, and in his youth he must

have been inspired by the constructions of that master metal-craftsman as well as by those of Picasso (10:37).

Ritchie gives a comprehensive summary account of a selection of artists whom he considers to be the best of our young American sculptors:

Mary Callery also absorbed something of Picasso's influence. Eventually she has arrived at her highly individual attenuated figures, AMITY (Curt Valentine Gallery, New York), balancing and weaving their own particular patterns in space.

David Hare, perhaps our purest surrealist sculptor, has brazed and welded wire and sheet metal into some of the most intricate constructions produced by any of this group. He is sometimes the victim of his own amazing industry, but at his best, in his FIGURE WITH BIRD (Kootz Gallery, New York), the genuine totemic magic he is striving for is completely realized.

Theodore Roszak, another worker in brazed metal, has said of his sculpture that the forms which he finds necessary to assert are meant to be blunt reminders of primordial strife and struggle, reminiscent of those brute forces that not only produce life, but in turn threaten to destroy it. His SPECTRE OF KITTY HAWK (Museum of Modern Art, New York), with its jagged clawing of space--a fearful commentary upon the power of the Wright brothers' invention--is perhaps the finest example of his dynamic genius.

Seymour Lipton's CERBERUS (Betty Parson Gallery, New York), with its anguished, fractured, spiked forms impales the eye with murderous force.

Herbert Ferber's AND THE BUSH WAS NOT CONSUMED (Congregation B'nai Isreal, Milburn, N.J.), a commissioned sculpture for a synagogue, is one of the most successful applications of the abstract expressionists' manipulation of space for the presentation of a specific religious symbol.

It is remarkable that all of these younger Americans, and most of their British bretheren, are working directly in wrought metals. The very intractibility of their materials, although most of them would deny the importance of materials as such, is almost a symbol of the toughness and vitality of their outlook. Their new imagery combined with their mastery of unconventional techniques are inspiring evidence that still another sector of the limitless frontier of sculpture is being explored right in our time (10:37).

## CHAPTER V

### METALCRAFT IN THE SECONDARY SCHOOL ART PROGRAM

More and more it has become a duty of the schools to provide direction in the adjustment of human beings to their environments. It is the school's responsibility to aid in the development of habits and attitudes which will help children to live happier and more purposeful lives so that, as they take their places as adults in society, they will be able to live well-balanced, meaningful lives. An appreciation of the relationships to the past will help a student understand and define his goals in the present and direct his future, so that he may make worthwhile contributions to his community and to society.

One of the factors which makes a strong contribution to the adjustment of an individual to his environment is the development of creative ability through art expression. America is beginning to realize that art is much more than a "few old masterpieces," that it is not alone for the "gifted few," but is an integral part of every boy and girl (11:v).

Robertson writes, "We can say one thing for certain --the power to create and to create harmoniously exists in every human being" (12:70). Art experience for every

child is now recognized as an important part of the American system of public education, but this was not the case until recent years.

Until 1900, art expression was considered an exercise and drawing of geometrical forms constituted the only course included in these earlier school curriculums. For most of the years after 1900, art education was intent upon discovering the nature of the plastic arts and on the methods of using that knowledge in teaching. In common with other special fields, art education dwelt upon the separate contribution to the individual, and was only vaguely interested in the place of art in the total program.

Credit is given by Logan (3:113) to the collaboration in 1908 between John Dewey, a philosopher at Columbia University, and Arthur Wesley Dow, an artist-teacher at the same university, for formulating a system of aesthetic education which aided the child's creative power and gradually changed the objectives of general art education in this country. The students of John Dewey and Arthur Wesley Dow were many in number, and they have been tremendously valuable and productive in their teaching positions. Inevitably, the outstanding persons among them were to provide the leadership in elementary

and secondary school art education up to the present time. It was from such understanding leadership that the creative approach to art education grew.

For too many years a belief was held that art was a special field of education which was reserved for only those with "talent." Mendelowitz, in discussing talent, says:

There are certain popularly held ideas about talent that need refuting: that talent is a rare and special aptitude and that this aptitude runs in certain families. Talents are not inherited; there are no genes by which artistic abilities are transmitted from parents to children; and the so-called talented child is often a child with only an average endowment of the intellectual, emotional, and physical attributes of the artist. The talented child, simply enough, is a child who has received, for one reason or another, sufficient satisfaction from a certain kind of activity to participate in it more frequently and with more intensity than do most of the children in the same age group and so has developed his capacities beyond the average of his group. When a child receives intense satisfaction from an activity, either because of the admiration he receives from adults and other children or because of a personal pleasure in the results, an ego-centered cycle of dynamic development is set up. Increased activity creates above average performance, which results in more satisfaction, which results in more participation. Before long the child's abilities have developed far beyond those of most children and consequently the child has a greater interest in the activity than do most children. This is called talent (1:11).

Guilford (13:5) thinks of creativity as being something that lies behind behavior; behavior that is imaginative and inventive. He believes that in

approaching the subject of aptitude or ability for creative performance, we do not believe that abilities alone will provide all of the reasons why people are creative or not creative. He states that in his recent studies, it has been shown that motivation and temperamental qualities enter into the picture. His interpretation is as follows:

There seems to be a popular opinion that creative performance is the special prerogative of the gifted few who are capable of it. If the child classifies himself as belonging in the non-creative group he accepts his fate and makes little or no effort to be original or productive. The truth of the matter seems to be that outstandingly creative people simply have in a high degree the same abilities that all of us have to some extent. A realization of this fact should be a real stimulus to many youngsters who have been afraid to try their wings for lack of confidence (13:17).

Since the "power to create and to create harmoniously exists in every human being" (12:70), the possibilities in helping every student to become a self-confident one are limitless. In order to aid the child in growth in creative expression it is of utmost importance that he be given opportunities which will engage his interest and thereby bring him satisfaction through his work. Modern Psychology teaches that a child will do well only in those activities in which he is able to find self-identification. This is one of the challenges in art--the development of a diversity of media



and materials in order that every student may find a means of satisfying self-expression which is compatible with his individual needs. Thus, the most important aim in all of the art education program must be directed toward this one goal--individual needs. There is no one path which leads to growth for all students unless that path be diversity, itself.

Victor D'Amico (5:25) believes that the child is the true artist in his ability to enjoy and use aesthetic experience, and that through the creative process he learns to use his native powers, to get more out of himself and to acquire insight into life. It is the business of the art educator to help develop the artistic capacity of each child through creative experience. For this purpose the school should offer as wide a variety of activities in art as is possible, so that each child may find his particular type of expression and have as many experiences as he needs or desires.

In the search for new materials, the alert art educator is constantly seeking unexplored media and methods which will stimulate the imagination and develop initiative in the student. Too often an art teacher may rely only upon that descriptive literature which is easily accessible and as a result, the program could repeat the same

activities year after year. It is fortunate for the children in our schools today that most art educators are of the former type--sensitive and alert.

It is important to realize that no one style or way of working is more basic than any other; any style can provide for development since it is the creative act that stimulates growth. In guiding children they should be encouraged to work in any manner which they find to be stimulating and satisfying (1:87).

The writer has shown in Chapter IV that as a result of the industrial age and technological society, metal has become an important medium for creative expression and many fine examples of metalcraft, in the form of metal sculpture, are to be seen in leading museums. Since art throughout the ages has reflected the different cultures of its people, it is natural that contemporary art should reflect the culture of the present day.

If the question were asked as to whether our schools were providing enough experience with metals as a part of an integrated program, the answer would have to be in the negative. Except for isolated instances, too little activity with this medium is in evidence in the school art programs. It is true that many educators recommend three-dimensional expression and they do not hesitate to include

"work with metal" in their suggestions (4:339; 4:331; 1:112; 3:7; 14:76). While the suggestion is made, there is not enough information available which tells how the student should go about getting the experience. Most of the opportunities for metalcraft are now provided in connection with the industrial arts courses. This is a far cry from using metal for creative art where freedom of imagination would be the objective. In this regard, Evans writes:

While metalwork has been used as a form of school handwork for approximately the past fifty years, it suffered by reason of the very dull, heavy, and uninteresting projects used in a definitely fixed course. In fact, the author has recollections of a high authority on school handwork advocating the chipping and filing of a three inch cast iron cube as a very suitable first exercise in metalwork (15:8).

With this burdensome approach, it is understandable that work with metal has not been widely adopted for classroom use. Mendelowitz (1:113) believes that not enough teachers are giving thought to the possibilities of three dimensional media. He feels that this is unfortunate because many temperaments derive great satisfaction from shaping materials into permanent form.

Lowenfeld makes the following observation:

The more inventive the teacher with the introduction of materials, the better. Openmindedness in regard to material used is one of the most important

attributes of a good teacher. However, economy in its use will also be significant. But, since the mere opportunity of getting the "feel" of the material is of great importance, the mere handling of it with some decorative purpose in mind will establish the desired relationship. Merely twisting a strip of sheet metal for holding a candle will introduce the quality of metal. Children should then be given an opportunity to improvise on their own account combinations of materials which need not necessarily serve a useful purpose (4:167).

Mendelowitz states:

Sheet metal as well as a host of other materials can be used to make figures, animals, masks and abstract forms. The weight and solidity of sculptural form, the strong tactile appeal of modeling in space, and the fun of bending wire and metal as media for contemporary expression--all of these experiences can only be had by working in three dimensions.

Craft activities provide many new areas in which students can work creatively, using the art elements of line, form, and texture, and through which they can become acquainted with many new materials, tools, and processes. Students enjoy using tools, and many craft activities provide good opportunities for such satisfactions (1:64).

Lynch recommends working with light metals in the simplest manner by the use of only tin snips and pliers.

He writes:

In this age of mass production and "disposables," it seems not only dull but anachronistic to emphasize technique to the exclusion of the sort of happy inspiration and improvisation. The danger of spending too much time on finishing details on small, utilitarian or decorative objects is that the amateur might, on his very first project, bog down, lose interest, and give up (2:25).

Art education has come a long way in providing rich experiences for the public school program, but there is much to be done in developing a comprehensive program for the upper grades and the high schools. Admittedly, the emphasis thus far has been on the elementary school level. This is a proper approach, but much research is needed to provide adequate experience for the older students in our schools.

With the greatly accelerated interest in metal as a contemporary art medium, the introduction of its properties in simplified direct handling in art classes could further the fundamental goal of providing art experience for all. Work with metal could add a stimulating challenge to imagination and initiative.

## CHAPTER VI

### REPORT OF THE STUDY

A progressive school arts program should strive to provide experience in creative expression which reflects contemporary modes of expression. Metal sculpture has become an important new mode of creative expression and should be reflected in the school arts program at the classroom level. It had been a conviction of the writer that some experience with metal construction could be included in the activity of the art classroom. The purpose of this study was to present evidence from personal experimentation, of practical, simplified processes through which the direct handling of metal could feasibly be added to the school arts program in such a manner as to increase the opportunities for aesthetic development.

The method used has been one of direct handling and personal experimentation with the tools and materials in order to test the workability and practicality of light metal. The accompanying illustrations are evidence of some of the possibilities offered in this medium.

## I. SPECIFIC LIMITATIONS OF THE STUDY

In order to develop valid ways in which work with metal might be offered as a classroom activity, there were several factors which had to be considered as limitations. These limitations became important in this presentation of the study because they specifically controlled the areas of investigation. The writer had set as the main objective the overall limitation of attempting only those projects which could be successfully carried out in the typical classroom of the junior high or the high school. This automatically eliminated any attempt at complicated processes which would require school shop facilities. This overall limitation has directed the study to expression, not from a professional approach, but from the standpoint of the student in the secondary school.

Within the overall limitation there were several specific limitations put upon the study by the writer:

1. All material used for the study should be only that which would be available to the student with little or no cost.
2. The metal used should be light enough in weight that it might easily be handled.
3. Any tools required must be those that may usually be available to the student from his home or from the school where there are accessible craft facilities.

4. All projects would be executed by direct handling of the material.
5. No projects would be attempted in this study which would require soldering processes.<sup>2</sup>

## II. MATERIALS AND TOOLS

With the above limitations in mind, the next important step was to search for a supply of suitable metal which bore the property of facility in handling and which was readily available and relatively inexpensive. Tin is the softest of light metals and possesses great malleability. Tin is the least expensive of all metals and can be purchased in sheets of different thicknesses and weights. Since the cost was a control factor, an investigation of using tin from discarded metal containers seemed worthwhile.

When the top and bottom rims of a tin can were removed and the side opened up, the resulting rectangle of tin offered endless possibilities for creative expression. Cans are available in many different sizes and in many different weights of tin. Examination disclosed a variance in quality and in the finish of the metal, so some discrimination is desirable in collecting

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<sup>2</sup>This is not meant to exclude the soldering process in situations where an interest in it is shown by the student, and where equipment is available.



containers for salvage metal. Some cans which have held non-acid substances reveal unsightly discolorations which limits their use to objects which may be painted. However, many cans which have held acid products are lined with a gold-colored acid resistant finish which is both attractive and adaptable for numerous creative ideas. Some of the larger containers bear horizontal indentations which have been imposed as reinforcement. Such reinforcement indentations could add a challenge in adaptation of ideas in constructions.

Students may be directed to select the more attractive cans from the discards of their own homes. To facilitate handling, the top and bottom rims should be removed with a wall can opener, and the resulting hollow cylinder opened by cutting down the side at the seam. The metal may then be flattened out and the pieces stored with greater ease. The sizes of the salvaged rectangles will vary from 4" x 6" of the small orange juice can to the larger 12" x 24" yielded by the containers of shortening and which are available at bakeries. Slight discolorations may often be removed by applying gentle abrasion with fine steel wool.

It is a responsibility of the school to furnish necessary equipment for the arts and crafts program and

this is highly desirable and should be encouraged. This study is concerned with the easily available tools shown in Figure 4. Obviously, the basic implement was found to be tin-snips. These heavy scissors for metal are often a part of the equipment in home garages or home tool chests. It would not be necessary for each student to possess a pair of tin-snips, although it would add convenience. Since tin-snips are manufactured in several sizes, a smaller or lighter pair might be more easily handled by the younger students.

Another tool which was important was a pair of pliers. The most desirable type for this activity would be those with long pointed tips. This type is classified as needle-nosed pliers and can usually be found in fishing tackle boxes. Here again, it would not be necessary for each student to furnish a pair of this type of plier, for they would not all be using this tool at the same time.

There were two other common household implements which should be available in the classroom. These were a hammer and a punch. A broken ice-pick may well serve the latter purpose.

These simple tools provide all of the necessary equipment needed to facilitate creative expression through the manipulation and handling of salvaged tin. No other



FIGURE 4

TOOLS USED ARE THOSE FOUND IN MOST HOMES

tools were used by the writer in constructing the examples contained in this study.

### III. CREATIVE EXPRESSION IN LIGHT METAL

The values of tin as a medium for artistic and creative expression have been generally overlooked in the past but it is a material with unique possibilities. The fact that an abundant supply of this metal is available at little cost increases the opportunity for exploration as well as the range of experimental activity.

Since form grows out of material and the material conditions the nature of the design, design and form should be developed together through manipulation. The CONCEPTION, POINT OF VIEW, INSPIRATION AND ORIGINALITY OF IDEA are of greatest importance.

Simplicity of ideas and materials does not in any way imply dullness. Creating aesthetic feeling from the mundane could add a worthwhile challenge to any activity, and can often be best achieved through the simplest process. For the beginner, the basic approach is direct; he picks up the piece of metal and starts to work with it. It is from the handling of the material in the most literal sense of the word, that the sculpture begins to grow and

take shape from the material itself. As one works with the material, ideas present themselves for further exploration.

The writer's first experience with this medium was in the construction of decorative wall plaques shown in Figure 5. This particular use of the metal is appropriate for effective Christmas decorations. Geometric medallions have long been used in decorative design and suggest snowflake-like patterns. The original form of the container lends itself to adaptations of these geometric medallion designs. Since no patterns were used, or should be used, the formal design was developed directly in the material and great variety resulted from the limitations which were imposed by the different sizes of containers.

In order to create the medallion, several cans in diminishing sizes were needed. After the top rim was removed, the can was cut vertically in strips. The strips may be wider in some designs and narrower in others, depending upon the desired effects. After the strips had been cut they were pressed out and down until they were horizontal to the bottom of the can. A number of smaller slashes were then cut vertically from the top edge of each strip. Holding the can firmly in the left hand, needle-nosed pliers were used to curl (or wind down) each



FIGURE 5  
DECORATIVE WALL PLAQUES

smaller segment in turn, around the can. At this point the first decision for design had been reached, for the manner in which these smaller segments are treated should be repeated on each strip.

This process was continued and repeated on two other cans, each smaller than the preceding one. The three decorated cans were then fastened together with a small bolt which was inserted through a hole which had been punched in the exact center of each separate layer. A fancy button or old earring was glued over the head of the center bolt to give finish to the plaque.

One or two decorated layers may be used as an effective holder for the larger size of Christmas candle, as illustrated in Figure 6. These candle holders and decorative medallions can be used at school or in the home at Christmas time, or for other special events. Many other variations may easily be developed. Other materials, such as coathanger wire and window screening may also be utilized.

It was a result of working with tin for the medallions that the unlimited possibilities for creative use of this medium suggested themselves to the writer. The idea of achieving texture seemed not only practical but desirable. Some experiments for textural effects



FIGURE 6  
CANDLE HOLDER



were carried out with the pleasing results shown in Figure 7 on page 58 and Figure 8 on page 59. This manipulation proved to be an exciting adventure in creative design. Rectangles of tin were placed face down on a surface cushioned with newspapers. Such objects as picture hooks, nuts, and wire were placed on the tin and their impressions pounded into the metal. Whether the design was random or controlled, the resulting texture was interesting and easily achieved because of the malleability of tin. Experimenting in textures would be a good way to begin working in this medium for it would acquaint the student with the medium and stimulate originality.

Another beginning manipulation which brings development of design concepts was that of working freely with a spiral of tin, with the result shown in Figure 9 on page 60. This was accomplished by beginning with a large circle of tin and cutting it in a one-half inch spiral from the outside edge toward the center. Through manipulation of the spiral strip, many interesting arrangements of form in space may be achieved. A similar example is shown in Figure 10 on page 61, where spiral-like forms were affixed to a shape which had been bent from a wire coat hanger. The resulting abstraction of a cock-like figure is stimulating to the imagination.

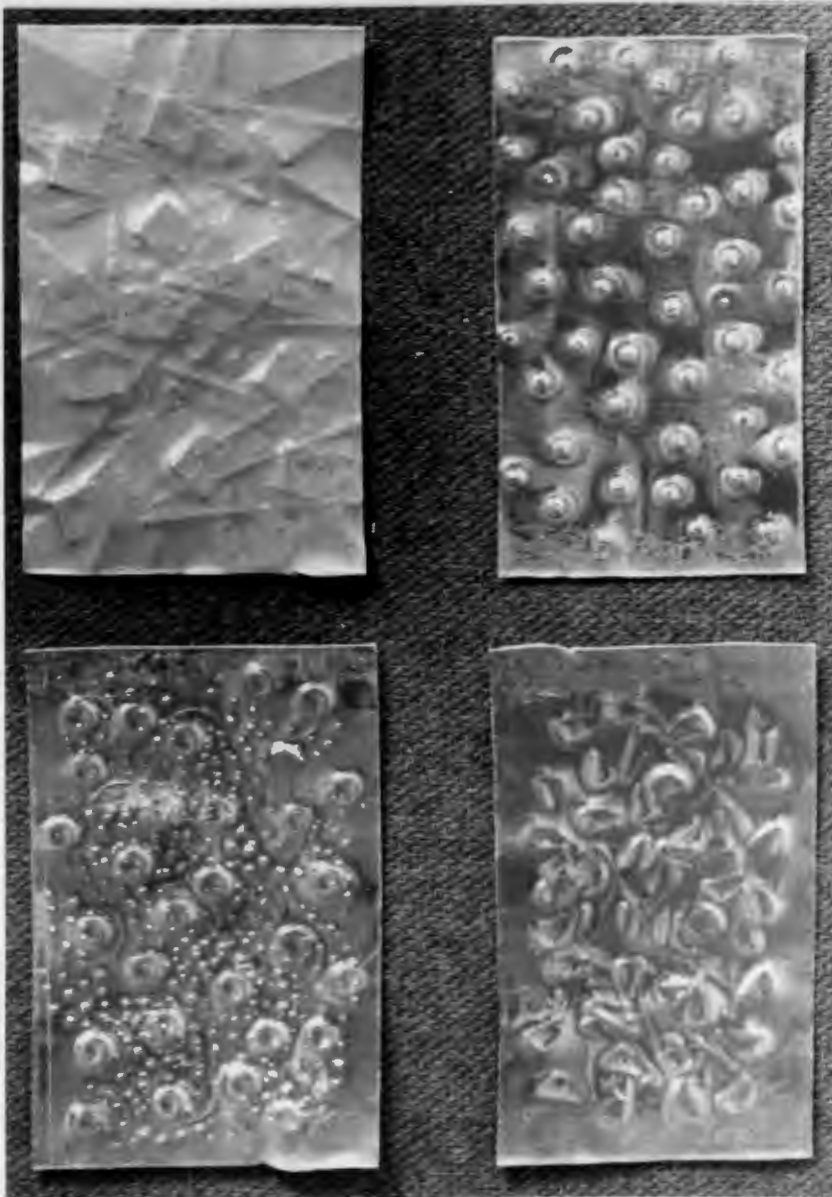


FIGURE 7

EXPERIMENT IN TEXTURING METAL



FIGURE 8

EXPERIMENT IN EMBOSSING METAL



FIGURE 9  
FORM IN SPACE

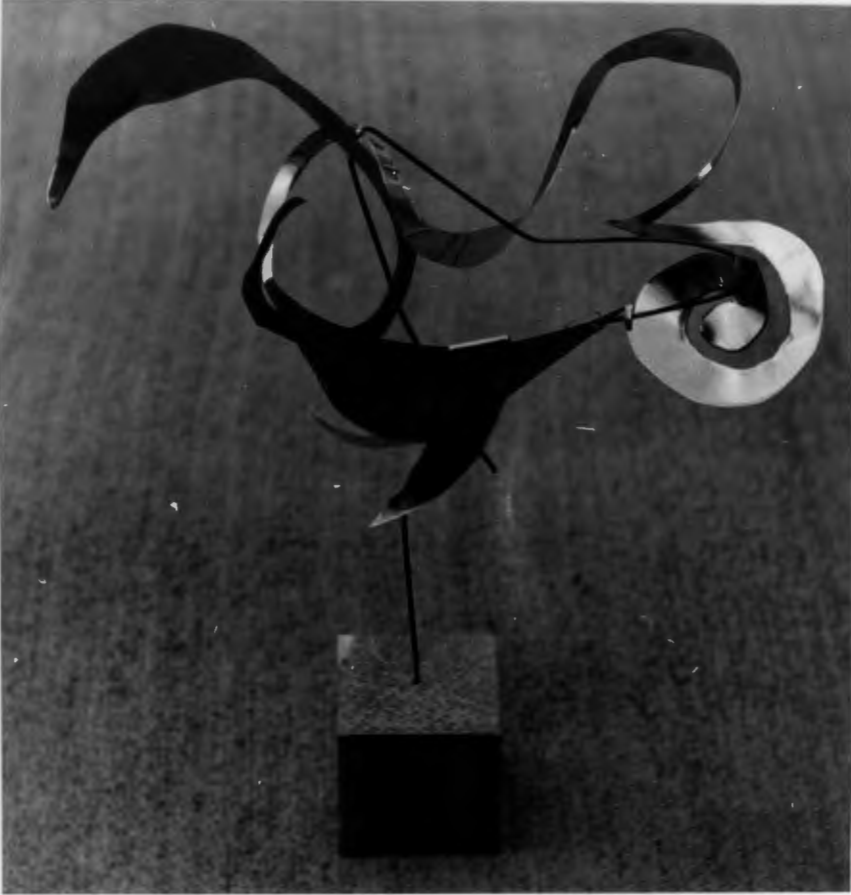


FIGURE 10  
ABSTRACT FORM OF COCK

A more controlled approach to the abstract is illustrated by Figure 11. Here, the basic form was developed first and then pressed into a slight curve so that it would stand without support. A wing-like form was added by inserting it through a slash in the basic form. The whole may be shaped according to the concept of the artist. There is an infinite variety of three dimensional construction which can result from this type of creative manipulation with light metal.

Non-objective design concepts can be developed in tin. A good way to proceed is to attack the piece of tin directly with the tin-snips, cutting angles and removing areas to create negative planes. Some specific parts of the flat design may be textured to add interest. After the cutting and texturing have been completed, the piece is bent into folds with some parts superimposed over other parts for added three dimensional effects. An example of this type of design may be seen in Figure 12 on page 64. The overall result was that of controlled non-objectivity.

A good way to provide opportunity for the development of discriminating division of space is to construct a frame from a wire coathanger and arrange within this area various shapes which have been cut from tin. In



FIGURE 11  
NON-OBJECTIVE FORM

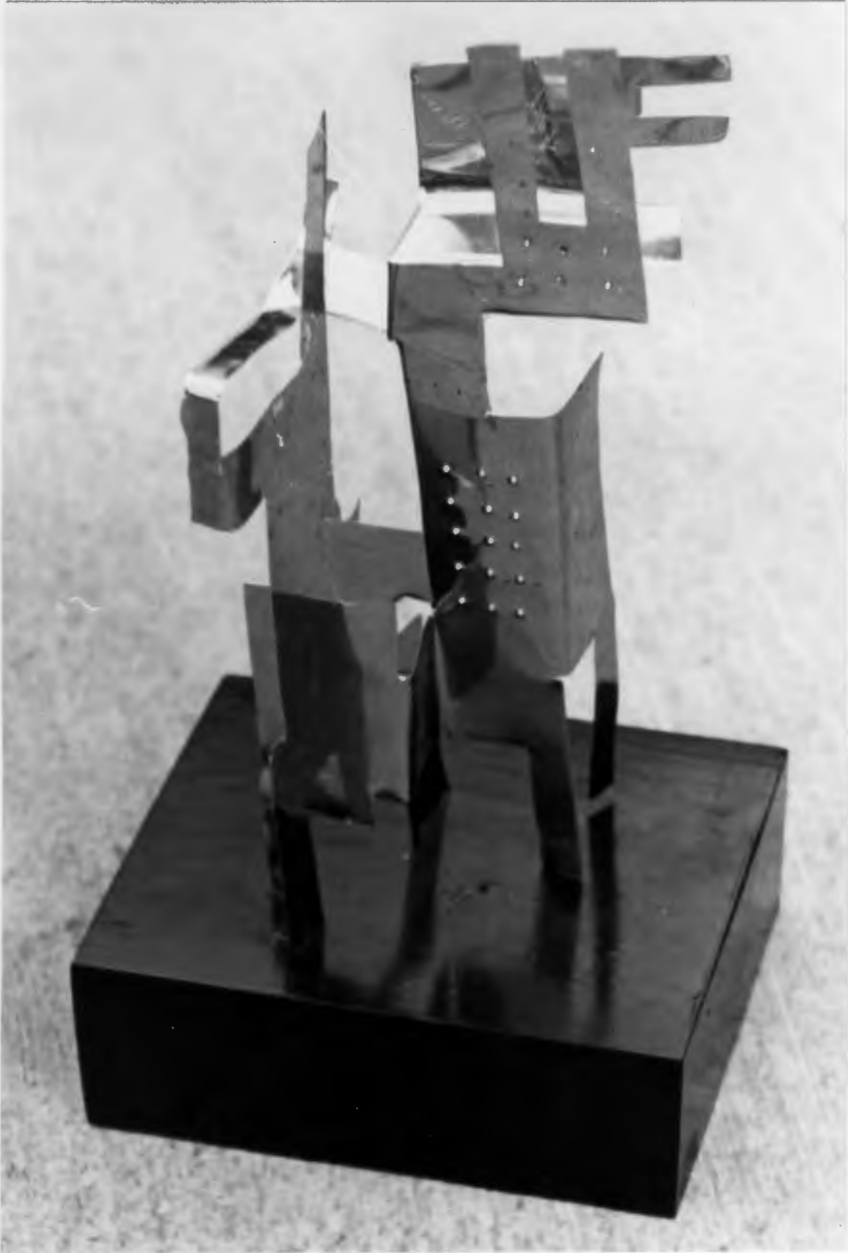


FIGURE 12

GEOMETRICAL NON-OBJECTIVE FORM



Figure 13 the tin pieces have been cut a little wider than the inclosed space and attached by simply bending the tin over the frame. The problem to be solved here was to achieve a pleasing and harmonious whole by assembling the parts. A circular form or abstract negative area would present additional opportunity for adapting form in space. Problems of this type can aid a student in his development of a sensitivity to space design.

Another effective way to use tin for freedom of expression is through the interpretation of animal forms. Here, again, the approach was direct--only the imagination limits the creative possibilities. For variation, bits of feathers have been glued to the head and tail of the ostrich shown in Figure 14 on page 67. Other materials such as leather, string, fabric, or grasses might be used in a similar manner. Because of the rigidity of the metal, the figure will stand without support if an edge of the foot is inserted into a notch made with a knife in the wooden base. This idea could be used successfully for illustrative purposes in correlation with particular studies in other classes. In Figure 15 on page 68 an animal form of a deer was constructed by cutting out the main area and then shaping and bending the resulting flat form into the desired attitude. The



FIGURE 13  
DIVISION OF SPACE



FIGURE 14  
REALISTIC FORM



FIGURE 15  
CONTROLLED REALISM

capturing of attitude in an animal made from so rigid a material can furnish a real challenge to the student.

A relatively new and contemporary form of design may be expressed in salvaged tin. Mobiles and stabiles, which convey form in motion, may be constructed. Because of the lightness in weight of tin, objects made from it may be effortlessly suspended to provide changing designs from motion. In the mobile shown in Figure 16, the fish form was first made in outline from a wire coathanger. Tin was then cut in shapes to fill the open spaces and laced onto the frame with fine wire. Paint may be used to stimulate fish scales, or open areas may be used to suggest surface texture.

A similar procedure may be used to create mobiles in abstract and non-objective design as illustrated in Figure 17 on page 71. Tiny swivels have been used between each segment of this form to assure gentle motion. The motion adds the interest of constantly changing design as the parts slowly rotate with air currents.

The stabile in Figure 18 on page 72 illustrates another concept of forms in motion. Here, instead of being suspended, the forms rotate gently from a center support which rests on a table. The stabile pictured was made by

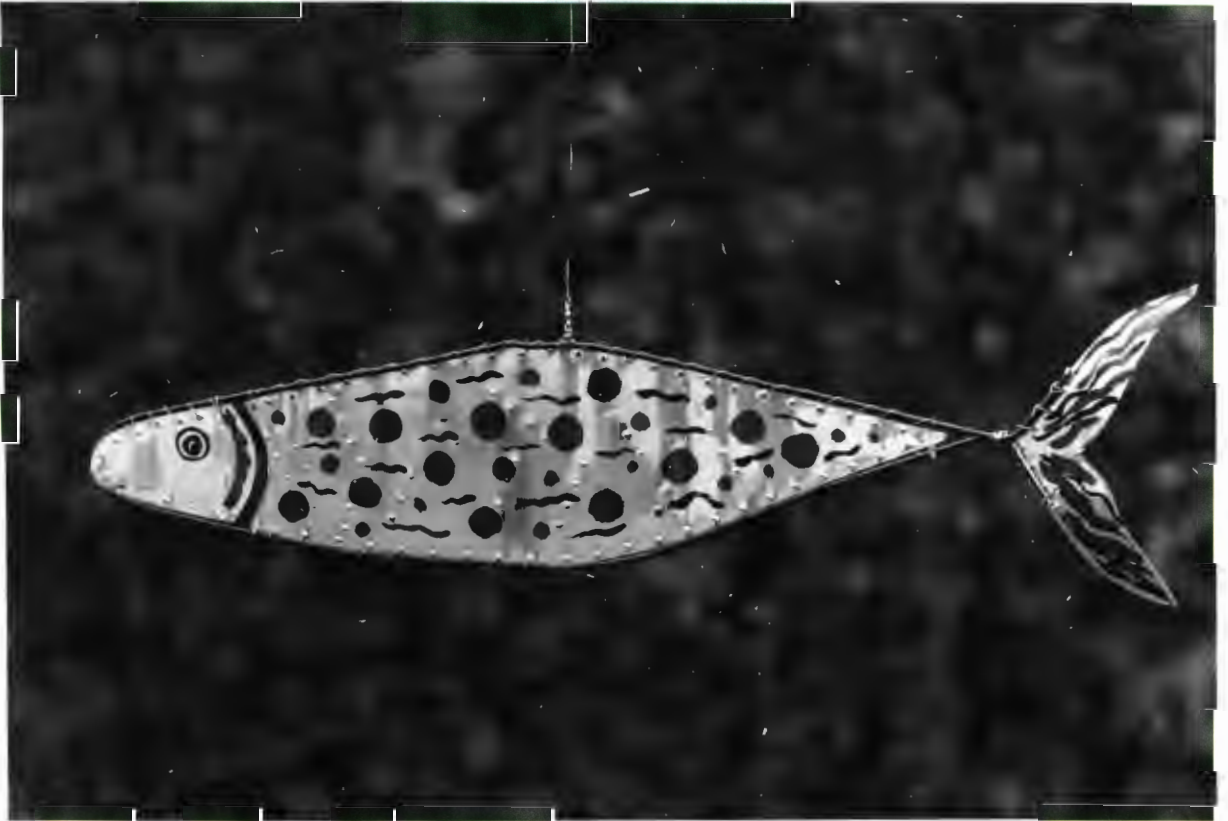


FIGURE 16  
FISH MOBILE



FIGURE 17  
FREE FORM MOBILE

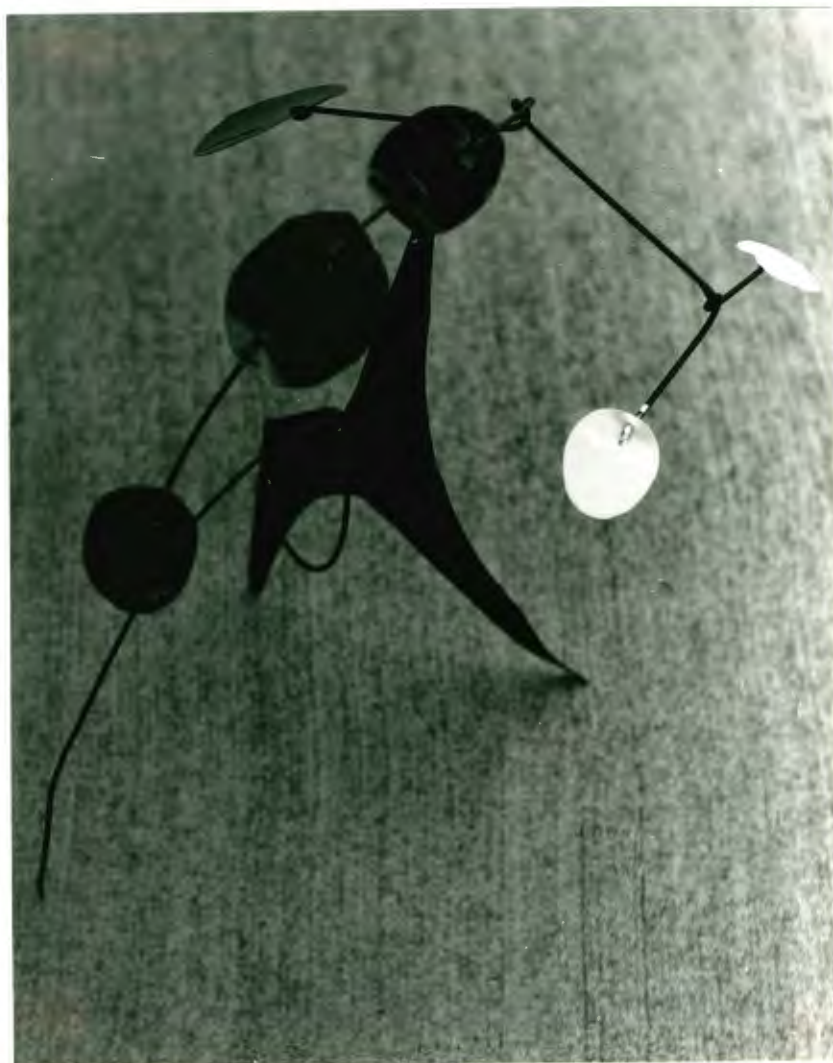


FIGURE 18  
STABILE



using only tin, tin-snips, and a wire coathanger; no adhesive or soldering processes were used. Paint was added in order to emphasize certain parts by the creation of contrast. This construction clearly demonstrates the opportunity for application of imagination and ingenuity.

Larger metal containers offer possibilities for pieces of greater size. The mask in Figure 19 was cut from a large ten-gallon container which was obtained from a bakery. First, the tin was removed from the container and pressed out flat. Next, an outline was lightly sketched on the metal and the shape was cut out with tin-snips. An ordinary household screwdriver was employed to emboss the design in the metal, and paint was applied to emphasize the design. Contour was achieved by cutting notches in the chin and cheeks, and then lacing the cut edges together with heavy twine. High school boys and girls will find enjoyment and satisfaction in the creation of fanciful masks.

Another creative activity which holds great merit would be that of interpreting action in metal. The aim of the writer, in the construction pictured in Figure 20 on page 75, was one of attempting to convey action



FIGURE 19

MASK



FIGURE 20  
FIGHTING COCKS

involving hostility and tension. The two cocks, arranged in a fighting attitude, do give a feeling of furious combat. The visual expression of attitudes is one of the important and basic criteria for judging the success of creativity in art expression.

These examples of construction have been worked out with simplicity to demonstrate that salvaged metal from discarded containers is a rewarding source of material with which to enrich the school art program. These examples are meant to be suggestions and evidence that this medium can be successfully handled in the school classroom without prohibitive investment in tools or special equipment. The figures shown in this study depict many types of art expression: geometric, formal, decorative design, free expression, non-objective, abstract, pictorial, realistic.

These experiments by the writer are offered as a point of departure for the teacher of art. Imagination and initiative in the handling of this metal can lead to valuable development in creative expression.

#### IV. FINDINGS

It was not the intent of this study to include experimental procedures with controlled student groups;

such an approach could be the subject for further study. This study was conducted as an investigation into and an examination of the potential creative contributions of light metal to the school art program. Certain opinions were formed and information gained which may contribute to further exploration of the subject. The findings presented are those of the writer and were arrived at through critical evaluation of his own work and investigations pertaining to the use of discarded light metal for creative expression:

1. Because art education should keep pace with current trends in professional expression, salvaged tin offers opportunity for experience in a resistant medium which can lead to a greater appreciation and understanding of metal sculpture.
2. Construction and collage with this medium can help to increase the student's awareness and perception of form in space.
3. Constructions from salvaged tin offer valuable opportunities to emphasize principles of design through the skillful use of line, mass and color, and the careful proportioning and arrangement of parts.
4. Due to the limitless supply of salvageable tin, it offers and encourages freedom of expression in handling.
5. Because of the softness and malleability of tin, it can be used for many types of constructions which formerly have been conceived only in paper.
6. The tactile resistance of tin can add a valuable challenge to the program of school art.
7. Tin offers a wide range of possibilities for textural treatment.
8. Work with tin can be carried on in the classroom with only household or simple craft tools.

9. The relative permanance of tin makes it possible for the students to create objects which can be taken home and enjoyed by their families.<sup>3</sup>
10. Since flexibility of thinking and originality of approach are important criteria for healthy mental growth, work with salvaged tin contributes to this development.
11. While objects created from salvaged tin may not possess intrinsic value, they do possess extrinsic value as may be expressed in the embodiment of ideas.

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<sup>3</sup>This is an important psychological and motivational factor for incentive (1:119).

## CHAPTER VII

### SUMMARY

Metal has been used for creative expression in art by craftsmen of every known culture. The earliest uses of metals were for utilitarian objects such as weapons and utensils, but it was also used for the creation of lavish decorative jewelry. As civilization progressed, man found new ways of using metals for art expression. Metal for large sculptural pieces was used by the Greeks as early as 500 B.C. During the Renaissance the metal craftsman reached his peak and metal was universally used for decorative purposes as well as for sculpture.

It was not until the twentieth century, however, that metal was used for sculpture by direct handling. The industrial revolution brought technological advances and during this period great progress was made in the development of new materials, tools, and processes. Imaginative artists, stimulated by a desire for freshness and originality in their work, began to create three-dimensional forms-in-space. In the beginning these applications of new ideas of form-in-space were somewhat experimental in nature, but later they were acknowledge as representations of art in a new age--the age of technology.

Today metal sculpture stands on its own merit as a valid art form, and examples are to be found in many of America's leading museums.

The concept of art education in the public schools of America is that art experience should reflect the environment and bring the student into closer alliance with the cultural manifestations of his environment in order to direct his aesthetic development. While attempting to provide opportunities for creative expression of valid art forms in a variety of media, public school art, in the past, appears to have lagged behind in the use of metal as an experience for the classroom. There have been logical reasons for the omission of this experience, and foremost among them has been the high cost of tools and materials. In order to work with sheet metals such as copper and brass, an especially equipped shop-laboratory would be advantageous and almost a necessity. This is a costly and often prohibitive expenditure for many hundreds of small schools. The problem of how to provide for the inclusion of some creative experience with resistant media presents a challenge to the art educator.

While much has been written for the professional artist, very little has been written concerning the



practical and simplified use of metal in a classroom situation. Many art curriculums recognize that work with metal is a valuable creative experience, but they fail to indicate how this activity might be carried out in the art class. This study has been made in an attempt to find ways in which light metal could be used in the art classroom.

The first factor of importance was to discover, through experimenting with the medium, a simplified process which would provide the experience but which would eliminate the necessity for costly special equipment. The second major consideration was that of discovering suitable material of tactile quality which would be available in quantity and which would be inexpensive. After considerable experimentation and investigation, the results of the study have demonstrated that experience with metal can be provided in the school classroom.

The easily accessible supply of discarded metal containers offers a ready source of suitable light metal. The metal which is salvaged from these containers offers unlimited opportunity for the stimulation and carrying out of imaginative ideas through a process of direct handling of the material. With the application of only household or simple craft tools, initiative, and incentive, this

material can furnish satisfying and creative achievement. The alert teacher of art can, in this manner, present metalwork as an exciting and creative experience for his students. This medium offers unlimited possibilities for collage and construction.

The test of an art experience is the extent to which it develops in the individual a sensitivity to the aesthetic values of his life and environment. The ultimate achievement of the creative process is the strengthening of the student's aesthetic perceptions. Through the use of metal, a student can develop an understanding of three-dimensional form which will help him to appreciate contemporary metal sculpture. The value of creating collages and constructions lies in the awakening and refinement of the tactile and visual sensations, so that life becomes richer and more full of meaning.

The inclusion of light-metal projects in the school art program will enrich art experience and add to the variety of expression which is an important and desirable goal in art education.

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**APPENDIX**



CAT  
CAST CEMENT AND CRUSHED STONE  
AGGREGATE



MASK

WOOD SCULPTURE IN PHILLIPINE MAHOGONY



Feb. 16, 1959  
211 E. 10th Ave.  
Ellensburg, Wash.

Director, Museum of Modern Art  
New York City, New York

Dear Sir:

I am in the process of writing a thesis on the subject of metal as an art form. I am tracing the use of metals in history and expect to bring in the modern use of metals for sculpture. I know you have a number of fine examples of metal sculpture in the Museum of Modern Art.

I should like to purchase photographs of some of these works to use as illustrations in my thesis-as examples of what modern artists are doing with metals. This thesis will not be published, so there would be no commercial use of the photographs. Do you have photographs for sale, or do you have brochures which contain illustrative material? I shall need four copies of each work. The photographs should not be too large-perhaps 4x6 maximum.

Will you be so kind as to advise me if you will be able to assist me? Thank you for any help you may be able to offer.

Sincerely,

92932

THE MUSEUM OF MODERN ART

NEW YORK 19

The Library

11 West 53rd Street  
Telephone: Circle 5-8900  
Cables: Modernart, New-York

February 20, 1959

Mrs. Alma E. McConnell  
211 East 10th Avenue  
Ellensburg, Washington

Dear Mrs. McConnell:

In reply to your letter of the 16th I can not send you 4 x 5 photographs of sculpture in the museum collection. All of our negatives are 8 x 10 and it would be just as expensive for you to have smaller photographs made from these as it would be to have enlargements made. The cost of an 8 x 10 glossy is \$1.00 plus 20¢ postage for each three photographs. I could pick out and send you various examples in this size or if it is possible, you should send names of certain artists or pieces of work that you are interested in.

You may be interested in the book, "Sculpture of the Twentieth Century", by Andrew Carnduff Ritchie. You may have information about this book by writing to the Publication Sales Department of the museum.

Should you be interested on 8 x 10 photographs of sculpture we would be happy to make them up and send them to you. The charge for the photographs is paid in advance.

Sincerely,

Willard Tangen  
The Library

Feb. 26, 1959  
211 E. 10th Ave.  
Ellensburg, Washington

Mr. Willard Tangen  
Museum of Modern Art  
New York City, N. Y.

Dear Mr. Tangen:

Thank you so much for your prompt reply to my letter of inquiry about photographs of metal sculpture.

You have two pieces in your collection which I believe will illustrate some of the earlier expressions. These two are:

Gonzales, "Head"

Calder, "Lobster Trap and Fish Tail"

Please forward to me three copies of a photograph of each of these works. (I mean three of each-six in all).

Enclosed please find check for \$6.40 which will cover cost and mailing.

If you should have available any bulletins on this type of sculpture, I should appreciate knowing about them.

Thank you for your kind attention to my inquiry.

Sincerely,

(Mrs. Alme E. McConnell)