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Raku and Stoneware Ceramics

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by
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Contents

I.

During my undergraduate art studies, I gave the greatest emphasis to two-dimensional art--drawing, painting, and graphics. But my goals in studying ceramics on the graduate level have stressed three-dimensional art. These goals include developing a full range of skills in ceramic processes, producing work for exhibition and sale, and most important, learning to prepare courses in ceramics for high school and other students. Since the primary purpose of my study is to achieve teaching competence in ceramics, most of my study has been devoted to gaining an understanding of the traditional and classical aspects of ceramics: throwing well on the pottery wheel and chemically formulating technically good glazes.

I deliberately chose ceramics as a medium in my master's study in order to broaden my aesthetic awareness and diversify my skills. My past art study has been heavily over-balanced in the two-dimensional area of art, so the emphasis on three-dimensional work for my M.A. was both necessary and logical to provide enrichment and a fresh approach to my creative expression. In setting up working goals, I had, due to my previous art background, a desire to see ceramic forms (and other art) fulfill more of a function than that of a purely visual experience. I like for forms to function,

even if the function is merely as a storage container or a vase.

I have always admired a skilled worker in any endeavor, and this admiration prompts me to seek to perfect the potter's traditional skills of wheel throwing. I feel sure that the majority of the ceramic pieces in my master's show will be largely what would be viewed as the classical forms. When I look at the classic work by master potters of past time periods, I am moved by the centuries of evolution the form has undergone, yet I recognize the timeless nature of the challenges they faced, for example, how to fit a handle to a form or what shape the shoulder of a pot should have. I feel personally insul ted when I look at the expressions of some of the "avant garde" ceramicists who incorporate a gimmick or technique that is foreign to ceramics such as the addition of photographically, silk-screened glaze images to pursuade the public that the object is something more than just clay.

In working with the ceramic medium, I am sure that the same influences which I responded to previously as a painter will also motivate my work as a potter. When I paint, I respond to nature forms, especially surfaces in the painting. The same organic textures subconsciously direct my ceramics. Recently I learned

that this association of art and nature is closely related to the oriental philosophy of Zen, and this formed the basis of my research entitled Tea, Zen, and Ceramics which I completed during the summer of 1979 at Lindenwood College in St. Charles, Missouri.

Although I work with traditional or classic forms, I still find much innovation and expression in working with the orientally-derived Raku ceramic firing technique. I find a great amount of satisfaction in working with the heavily grogged clay; I like the challenge of throwing with it and seeing the different textural qualities the extra grog in the clay body produces. In addition to the textural qualities of the Raku clay body, I enjoy the effects of reduction materials on the Raku glazes, specifically, the lusters and crack patterns.

Presently I am becoming increasingly interested in sculptural forms that are non-functional and are purely visual. I am unsure if this approach will be shown in my culminating ceramic show, but I am planning sculptural forms of a large scale to be constructed from stoneware wheel-thrown shapes with the inclusion of cast portions of the figure molded from life.

II.

Art expression of any form must come from the person executing the work. The artwork can be on any of many levels of refinement, but, it must satisfy a specific artistic purpose (unless the work is intended for commercial use). Achieving this satisfaction of purpose depends somewhat on the degree of harmony between the artist's creative expression and his personal life style, for the two are interwoven. I find that the nature or character of my work is very much related to my life style. My enjoyment of nature and the outdoors is reflected in what functional objects I choose to make and the detail treatment that the form receives.

My appreciation of rustic, rural life, is in contradiction to my working (teaching) environment in the suburbs of the city, but my living environment on a secluded farm is consistent with my love of natural life, and I believe this love comes out artistically in my ceramic work. I think that the best example of the rustic influence is represented in the Raku fired pottery. The Raku clay body formula contains approximately 20% fine sand which gives the finished pieces a surface texture or "tooth" representative of the unrefined nature objects, like a weathered stone, tree bark, or barren earth. Although the Raku clay body has an excessive amount of sand, which is needed to withstand the firing method, I also enjoy an excessive

amount of sand in my stoneware clay body for texture. I prefer the rough textural surface, but I still like to see this surface in combination with a refined form. However, I have not yet internalized the characteristic distorted rims and calculated crude forms of Zen origin to emphasize the "humble" and "poverty" as referred to in Raku by Tyler and Hirsch.[1]

Many ceramicists work purely for the visual response, and although that is the experience which is of primary importance to me, I also feel the need for the ceramic form to function simultaneously with its pleasing visual experience. I am aware of the extremes of approach among potters, one side maintaining that function should dictate what the shape of a ceramic piece should be and the other side insisting that the form is the primary consideration and function is second (or not at all). I am certain that my earlier training as a commercial artist is responsible for my present need to feel that my art is marketable as a functional product. The forms can be appreciated on my levels, depending on the viewer's knowledge of the skills involved. Some people can appreciate a pot simply for its function but others will go further and appreciate the form and the pure aesthetics of the piece.

In my study of commercial art in college, the emphasis was always on precision and exactness in the controlled elements of the art. I learned to strive to be a first-rate craftsman and to recognize that skill and technique are the enduring qualities in art. There always are fads and "isms". But when these short-lived art movements pass, a great many of the figures involved also fade with them. It is this attitude, or respect for true skill, that motivates me to master the traditional skills of the potter.

To study ceramics, to learn pottery wheel techniques, to construct and contemplate sculptural forms--these have been a fresh and expanding part of my artistic awareness. Prior to my work in sculpture at Lindenwood College, I had little interest in the three-dimensional due to the generally slow-paced working techniques of sculpture. After studying sculpture (welded steel constructions), I did further work in ceramics and found that I enjoyed the faster work pace. Prior to my three-dimensional study, my favorite medium for expression was water color painting. Both clay and water color involve a fairly brisk pace of working and a do-it-right-in-one-shot approach. With clay, the artist walks a tight rope; the clay form is either "right" or not, and if it isn't, he should fold

the clay and begin again.

It has never been my intent to discontinue my interests in painting. I have found early in my work with three-dimensional forms that as skills develop in dealing with three-dimensional, there is a carry-over in representing objects more easily in two-dimensional media. If I were to speculate on future development of my work, I see the three-dimensional study as an enhancement of skills for work in two-dimensional areas.

At this point of evaluating why I chose three-dimensional expression for my master's study, I believe there are two reasons for working with solid forms rather than images of the forms. The first reason is for change, the need for fresh means of expression, and the second reason and possibly the greater of the two is the physical involvement that is needed for ceramic or sculpture work. In the course of my approach to working, I have a nervous drive that must come out in the work process. In painting there is a certain amount of physical energy that is expended, but there is comparatively more working with the clay. There is the lifting of bags of dry clay, mixing the clay, working the clay to the proper consistency--the creative experience is (as a generalization) much more physically demanding than working with the two-dimensional arts. Frankly, I enjoy the energy drain.

III.

In developing an attitude or working approach to ceramics, I was torn between whether form or function should dictate what shape a piece should take. The first book to have impact on my concepts of approach to form was Pottery: Form and Expression by Marguerite Wildenhain. My concepts are still consistent with those ideals. Wildenhain, in discussing ceramics, expresses a pure truth in one concise statement (she must work as she speaks): "All pots are functional, even those that are supposed to be purely decorative, for that is their function." [2] I feel that I must have integrated very much of Wildenhain's philosophy early, from reading, without being totally aware of the extent of the influence. I have mentioned previously my admiration for the classical tradition. Wildenhain continues on function:

> If he has a teacher to show him how to make spouts, lids and handles, it will be to his advantage, for men before him have faced the same problems and have found many ways of solving them basically. This is where tradition is all important; it will save him years of dabbling around. [3]

The above quote expresses the importance of tradition and skill standards of pottery; these are my feelings also. Since my initial objectives in ceramics are to gain competence in the traditional skills, it is my position that the refinement of a form and how it functions is not a task that can be solved in a year or two;

the challenge is an on-going one. Wildenhain comments on the refinement of form:

> Not for nothing is man said to have been made out of clay, it is the basic stuff of life--and, just as a poet who might want to write about mankind, after a year's experience of life, would fail, so the potter who thought he was a competent potter after the same length of time would obviously fail, also. It takes years to find valid and genuine forms and it takes all the skill, intelligence, feeling, experience, talent, discrimination and integrity of a man. It is in the widest sense a problem of human development and of how to pour the sum of a man's experience of life into form.[4]

Wildenhain develops the suitability of materials to forms; she stresses that the materials should be related to one's outlook and experience. Earlier I mentioned my enjoyment of nature and love of the outdoors as being a central factor in my choices of clay and firing methods. Wildenhain sums up the approach to materials that I am in total agreement with:

> To work with a material that is formed either in the liquid or malleable state and that hardens to rock through a process of firing will necessarily require a thorough knowledge of the stages of its transformation. But it is still more important to realize the fact that, depending on the basic composition of the clay, different forms are possible and suitable, and to use this fact with understanding. A meager tile or terra cotta clay with either fine quartz or coarse grog will lend itself to quite another range of forms than would, at the other end of the scale in ceramic materials, a high-fired vitreous procelain body. Thus a teacup or a pitcher made out of stoneware clay by a potter with a conscious feeling for his material will differ widely

> from those that same potter would make in a fine translucent porcelain; in their whole character and in every detail they would differ --in the thinness of the main body, in the distribution of the separate volumes, in the curves and angles of spouts, feet, bellies and handles; and they would besides ask for a totally different range of decorative treatments.[5]

Trying to understand why I approach art expression as I do, I am certain that the core of my relationship to clay, materials, and forms is largely dependent on my early reading of Wildenhain's philosophy; but there is an attitude, nature, or "essence" to my work that seems to be fleeting and difficult to define; at times I see the presence of this feeling, and at others I can see an obvious absence. The closest I have been able to understand this essence (analytically) is through the Japanese concept of wabi which is connected to Wildenhain's philosophy by what might be labeled as sincerity or "being true to one's materials."

Wabi, a philosophy with Zen as the origin is, I believe, the basis for many potters' approach to living and working as artists. Wabi is a spirit or essence that exists within a sensitive artist and may be a conscious or unconscious response. Wabi is described and followed by a poem in Raku Pottery by Robert Piepenburg:

> Wabi is the natural expression of feelings that are neither ostentatious nor imposing, and its spirit is the essence of the tea ceremony. A Buddhist might use the word compassion to

> describe the feeling of the ritual; an occidental might use the word <u>love</u>. It is that part of our being which emanates a simple and open love and an honest experience of union--whether it is the love of another human being or the empathy for leaves floating in the wind.[6]

The following is a selection of verses written by Rikyu explaining the meaning of <u>wabi</u> and the spirit of the tea ceremony:

> Many though there be
> Who with words or even hands
> Know the Way of Tea.
> Few there are or none at all,
> Who can serve it from the heart.
>
> If you have one pot
> And can make your tea in it
> That will do quite well.
> How much does he lack himself
> Who must have a lot of things.
>
> When you hear the splash
> Of the water drops that fall
> Into the stone bowl
> You will feel that all the dust
> Of your mind is washed away.
>
> In my little hut,
> Whether people come or not
> It is all the same.
> In my heart there is no stir.
> Of attraction or disgust.
>
> There is no fixed rule
> As to when the window should
> Closed or open be.
> It depends on how the moon
> Or the snow their shadows cast.
>
> Flowers of hill or dale
> Put them in a simple vase
> Full or brimming o'er.
> But when you're arranging them
> You must slip your heart in too.

Though invisible
There's a thing that should be swept
With our busy broom.
'Tis the dirt that ever clings
To the impure human heart.

Though you wipe your hands
And brush off the dust and dirt
From the tea vessels.
What's the use of all this fuss
If the heart is still impure?

When you take a sip
From the bowl of powder tea
There within it lies
Clear reflected in its depths
Blue of sky and gray of sea.

In the Dewy Path
And the tearoom's calm retreat
Host and guests have met.
Not an inharmonious note
Should disturb their quiet zest. [7]

The previous quote expresses a life philosophy that I believe to be the necessary foundation for any serious approach to art and expression. Art begins with a feeling of caring for one's work and having a contentment that is dependent only on one's inner state. Another Rikyu poem that expresses a "feeling" or "state" of being that I appreciate is from Zen and Japanese Culture by Daisetz T. Suzuki, and is said to express wabi:

The snow covered mountain path
Winding through the rocks
Has come to its end,
Here stands a hut,
The master is all alone;
No visitors he has,
Nor are any expected. [8]

IV.

During my ceramics study, the bulk of my finished work has been stoneware wheel-thrown pottery, fired in a gas kiln to cone nine temperature. When I think about the forming of ceramics--the stoneware and the raku--I consider the stoneware pieces more from a standpoint of being "work" and think of the raku as recreation. Since the raku is my "recreation," I would like to discuss first the methods, equipment, and learning that were involved with the raku and discuss the work in stoneware second.

Prior to my ceramic work, I did ceramic raku firing at Lindenwood College during a course with the aid of an instructor. In the previous class work, all of the technical problems of glaze formulation, clay body mixture, and firing were taken care of by the instructor. When I wanted to do further raku firing, I realized that there were a great many technical difficulties to be solved, and as further experience proved, one can't use a book and "do it by the numbers."

My primary information resource was the book Raku Pottery by Robert Piepenburg. Many raku firings take place out of doors. Employed as a high school art teacher, I have the need to be able to demonstrate raku firing techniques at various locations using a compact portable kiln. After discussing this with my ceramics

instructor, Sam Rudder, I decided that a small kiln could be constructed from a shortened 55 gallon oil drum. The inner insulating liner material is Fiberfrax ceramic wool, available locally in St. Louis through Christy Fire Brick Co. [9] The fiber wool insulation was secured to the inside of the metal drum using stoneware "buttons" pulled into the insulation and held with lengths of nichrome wire (see photos). The insulated kiln rests on a layer of fire bricks on the ground and is lifted away from the pottery by permanently attached handles on the kiln when the glazed work inside is ready to be removed. The burner, forced air blower, heat intake opening, and flue were all arrived at through experimentation. The heat intake opening on the bottom side is approximately 6" by 10" and can be adjusted by closing off the opening partially with fire bricks to alter the secondary air being drawn by the flame. The flue measures 8" by 8" and is located on top of the kiln and on the opposite side from the heat intake. The heat intake and flue arrangement described seem to create a spiraling of the heat flow when the kiln is loaded and operating.

The burner that I use with the kiln is an adaptation of a flange type burner described and illustrated in Raku Pottery by Piepenburg [10] (see diagrams). I found that the flange type burner works well when used with propane as the fuel source. I later adapted the burner to operate with forced air and natural gas which reduced the amount of time needed to bring the kiln to maximum firing temperatures.

Arriving at a functioning glaze for the raku pottery was initially difficult since I wanted to avoid the base glazes containing lead. Several base glazes listed in Raku Pottery by Piepenburg were tried with results that were not entirely satisfactory due to excessive bubbling. Through trial and error, I found that a 50/50 mixture of Gerstley Borate and Nepheline Syenite worked well over the clay body I used. The raku clay body I have used with pleasing results has the following composition: AP Green Fire Clay 50%, OM4 Ball Clay 30%, Talc 20%, and Grog 20%. I have also raku fired the clay body I normally use for stoneware with good results.

For variety of color additions to the base glaze, I added oxides and carbonates in standard recommended proportions found in any of the ceramic reference books; the one I use is Clay & Glazes for the Potter by Daniel Rhodes. Applying the glazes is done by dipping the

small pieces and spraying with a gun and compressor for the larger forms.

The raku firing process I have used is fairly standard. The glazed pots are stacked on the fire brick ground liner, one or two levels high depending on the sizes to be fired. The kiln is lowered over the pottery and the burner is lit. The first load of pottery is heated slowly; the average first firing time is about 1½ hours. After the fire brick floor heats up, additional firings can be as quick as 18 to 25 minutes depending on the size and quantity of ware in the kiln. Each time the kiln fires, the condition of the glaze can be visually observed through the flue opening (cautiously and at a safe distance). When the glaze ceases to bubble and has a "wet " appearance, the burner is turned off, the kiln is lifted away, and the pottery is placed into tightly covered metal containers with combustible material such as sawdust to burn, smoke, and reduce the glaze.

For a discussion of my stoneware work, the logical beginning seems to be the clay. Early in my wheel-throwing work, I had various difficulties, particularly with the larger forms, and could not throw the tall cylinders. I was using a clay body mixture that included a minimum of 25% to 30% grog. I eventually realized that the presence of excessive grog causes the

clay body to take on excessive water very quickly during the throwing process, causing the clay to weaken and usually collapse.

At the suggestion of my instructor, I tried and found successful the following clay body mixture: Hawthorn Clay 25%, AP Green Fire Clay 10%, N-1 Red Clay 10%, Grog 5%, OM4 Ball Clay 25%, and Gold Art Clay 25%. This clay formula has met my needs quite satisfactorily, but I do plan further experiments. This particular formula fires to a nice toast brown color with iron spots and has a shrinkage of 11% in cone 9 reduction firing. Having an acceptable clay body increased my throwing capability considerably.

There have been many things that have influenced my wheel-throwing work, but one of the simpler method changes has made the most significant improvements in quality of throwing. That change was simply to weigh the clay with a scale, so that the clay I'm using is repeating the weight-to-size relationship in the forms. For example, when throwing tea cups, I have all of the clay balls weigh the same (I use grams). This has improved consistency a great deal. When I work with larger amounts of clay--up to 30 pounds--I use a bathroom-type scale to maintain consistency of weight.

My work is composed of clay and glaze only, and as I have mentioned earlier, I do not care for gimmicks

or the addition of foreign materials to the ceramics. During my recent study, I mixed and tested considerably more than 200 glaze tests. Some of the glaze tests were from reference books such as Complete Compendium of Glazes by John W. Conrad and Clay & Glazes for the Potter by Daniel Rhodes. Many of the glazes tested were glazes for which I used theoretical "ideal" base formulas given as unity chemical formulas and converted the unity formula to a batch mixture using the raw materials that I had available.[11] Of the various base glazes tested on my clay, the base that has proven most appealing to me is as follows:

F4 Spar	43.77
China Clay	1.52
Flint	27.36
Whiting	2.74
Gerstley Borate	9.12
Dolomite	9.12
Zinc Oxide	1.82
Barium Carbonate	4.56
	100.01

and the unity formula for the above:

Na_2O	.1368
K_2O	.0912
CaO	.4574

MgO	.1639
ZnO	.0744
BaCo	.0763
B_2O_3	.2191
SiO_2	3.14
Al_2O_3	.31
	.9993

In addition to the cone 9 stoneware glazes that I have worked with and analyzed chemically, I have also mixed ash glazes with various results. Rhodes gives a starting point for experimentation with wood ash glazes.[12] The beginning mixture for cone 8 base glaze is: Feldspar 2 parts, Wood ash 2 parts, and Ball Clay 1 part. Rhodes' directions are to increase the clay in small percentages if the first test is too shiny or runs excessively. Ash glazes have been very pleasing to me--the results are always different, depending on the mineral content of the wood ash and what clay body the glaze is used over. The accent colors I use on both the ash glaze and chemical glazes is a mixture of 95% Albany slip clay plus the color oxide or carbonate desired.

V.

My goals for ceramic work in the master's study program have been realized by developing the technical competence to formulate glazes chemically from raw materials and with an understanding of the function of the chemicals in glazes, I can modify and adjust glazes to suit changing needs. The expanded understanding of the glazes helps me to further experiment with the glazes that cannot be analyzed chemically such as the ash glazes and the local clay glazes. The additional knowledge opens the way to endless experimentation and further work with glaze formulation.

Since my primary goal in the master's study is to become competent as an instructor in ceramics art for high school and other students, I have further met my goals by perfecting my wheel-throwing skills, specifically by controlling initial clay weights up to 30 pounds and throwing forms in excess of three feet in height by the coil and throw method. The learning experience has given me great personal satisfaction. I have gained ease in throwing forms on the wheel, an intelligent approach to glaze formulation, and confidence in handling the firing procedures of pottery. I have included additional pages of sketches of how I constructed my portable raku pottery kiln and burner unit (which can function with propane or natural gas). The construction of the kiln is only one of many possible

methods of construction; it has proven to be quite satisfactory in my experiences. Also included are "action" photos the reader may find of interest.

Of the many realizations I have experienced, one in particular is worth mentioning. The clay itself has little value as it is, but it is the learning and growing experience that matters: how the potter changes as he works with the clay is what is important. In my contemplation of why I make the forms I do and why I choose one glaze rather than another, or why I prefer raku to stoneware, a statement in Piepenburg struck me as relevant:

> Whether or not today's raku potter should reflect the philosophical Oriental heritage in his ceramic forms is a matter of personal choice. If an American potter were to incorporate some other standard of form for expression, as seen in the work represented in this book, there would be no need to feel any apprehension; it is not the form or even the philosophy of raku that is important--the form will disappear in time, it is sure to be broken--it is the experience that lives and moves life forward.[13]

It is my opinion that raku is a valuable art form because it reaches the fusion of sense and sensibility, of past and present, of form and function. The simple forms which emerge are beautiful to me because all the senses are involved: touching the clay when it is first wedged; hand-building the pot or throwing on the wheel; constantly smoothing, trimming, pressing, pushing, bending; hearing the roar of the gas burner and blower unit as the kiln fires; smelling the burning exhaust fumes and wood smoke when the glowing pot is submerged in saw dust; and breathing in the clay dust and tasting its harsh dryness. So I think Piepenburg is correct when he says that it is not the form or even the philosophy that is important, but it is the experience that lives. When a beautiful object moves out of the realm of inanimate form and becomes, quite literally, an experience, then art is born.

Notes

[1] Robert Piepenburg, Raku Pottery (New York: MacMillan, Inc. 1976), p. 17

[2] Marguerite Wildenhain, Pottery: Form and Expression (New York: Reinhold Corp., 1962), p. 65

[3] Wildenhain, p. 65

[4] Wildenhain, p. 29

[5] Wildenhain, p. 60

[6] Piepenburg, p. 27

[7] Piepenburg, p. 27 & 28

[8] D. T. Suzuki, Zen and Japanese Culture (Princeton University Press, 1959), p. 282

[9] Christy Fire Brick Co., 3144 North Broadway

[10] Piepenburg, p. 110

[11] Daniel Rhodes, Clay & Glazes for the Potter (Kodansha International, Ltd., Palo Alto, California, 1975), p. 266

[12] Rhodes, p. 290

[13] Piepenburg, p. 35

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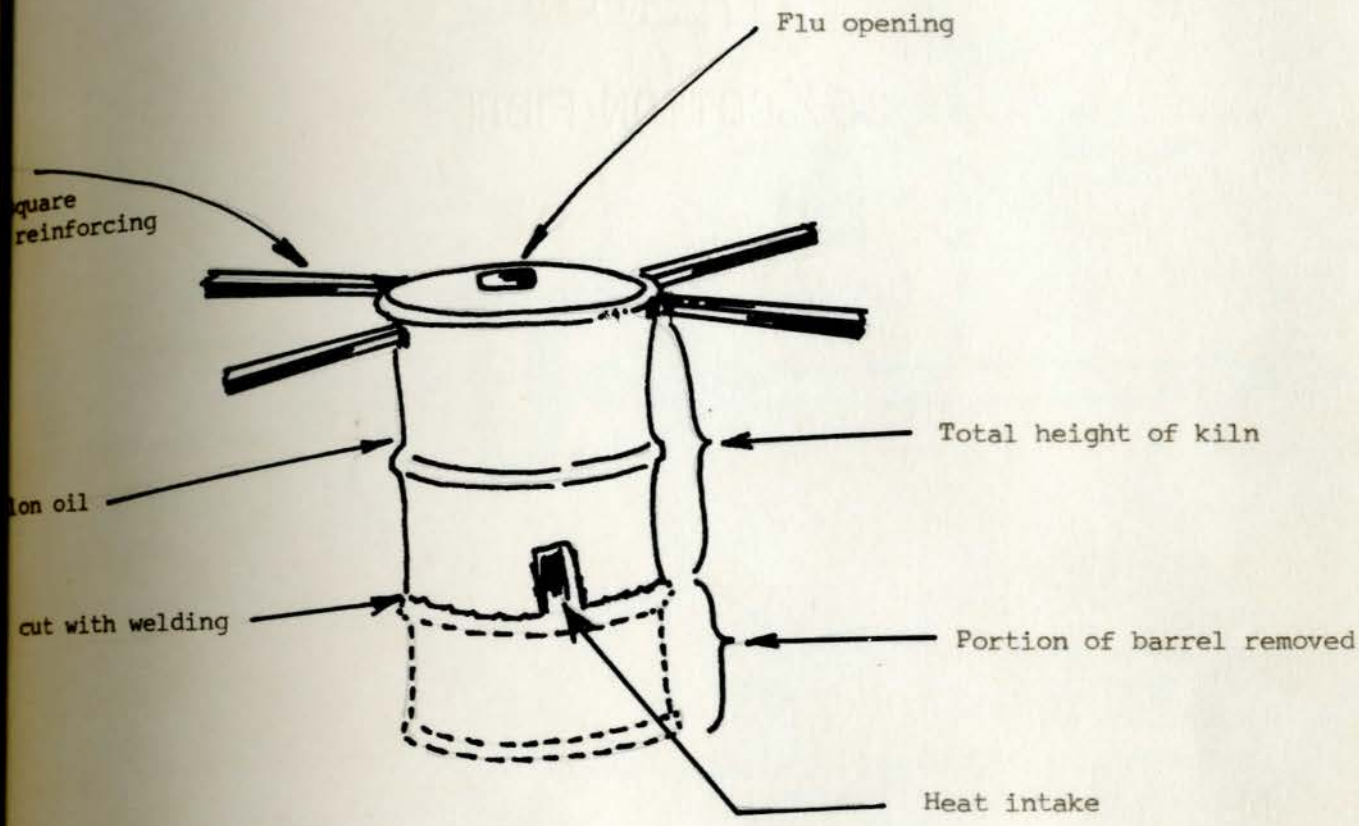
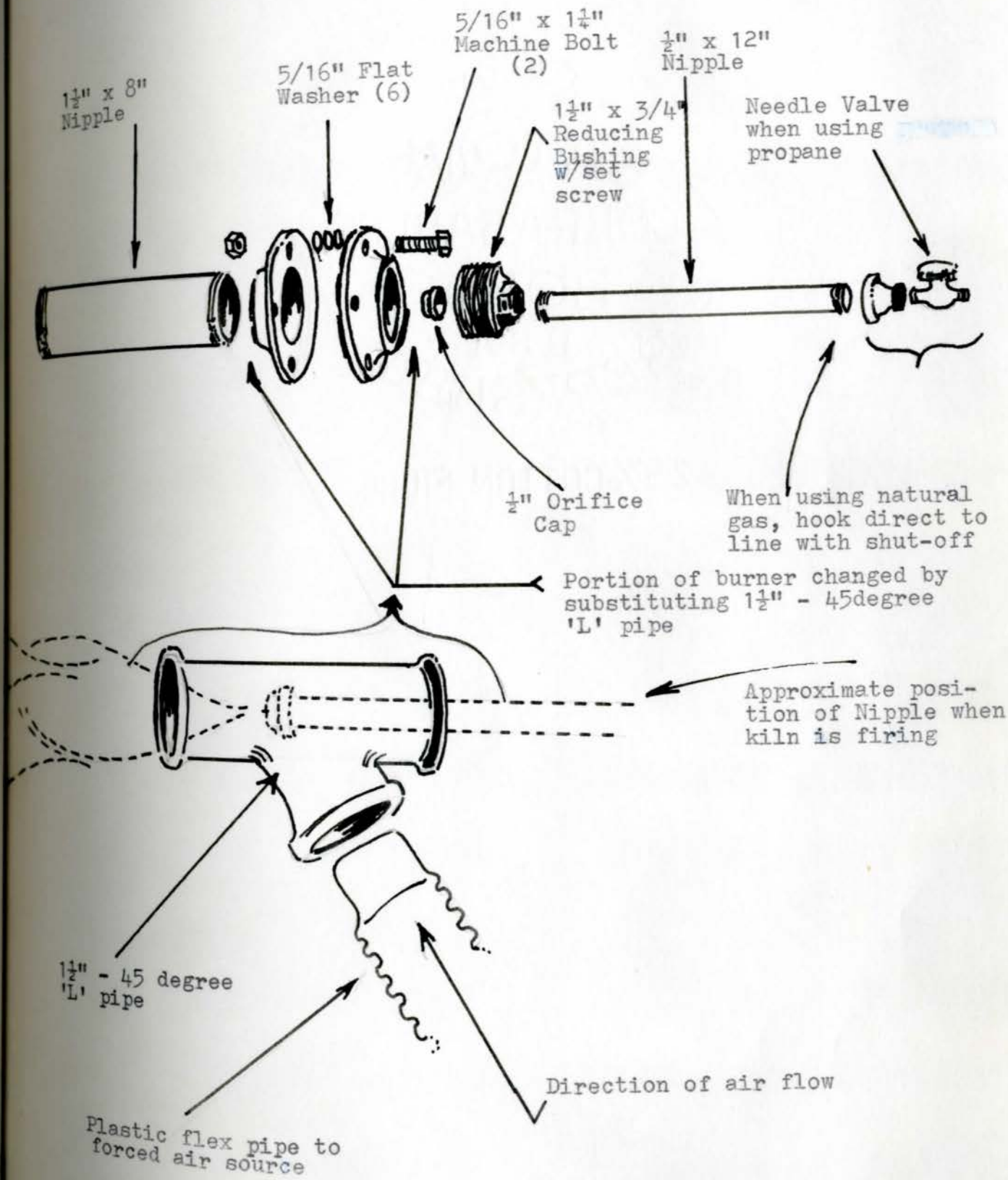


Portable Raku Kiln


5/16" x 1¼" Machine Bolt (2)
½" x 12" Nipple
1½" x 8" Nipple
5/16" Flat Washer (6)
1½" x 3/4" Reducing Bushing w/set screw
Needle Valve when using propane
½" Orifice Cap
When using natural gas, hook direct to line with shut-off
Portion of burner changed by substituting 1½" - 45degree 'L' pipe
Approximate position of Nipple when kiln is firing
1½" - 45 degree 'L' pipe
Direction of air flow
Plastic flex pipe to forced air source