THE CARVING OF NATIVE STONES OF OREGON

by

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A CREATIVE TERMINAL PROJECT REPORT

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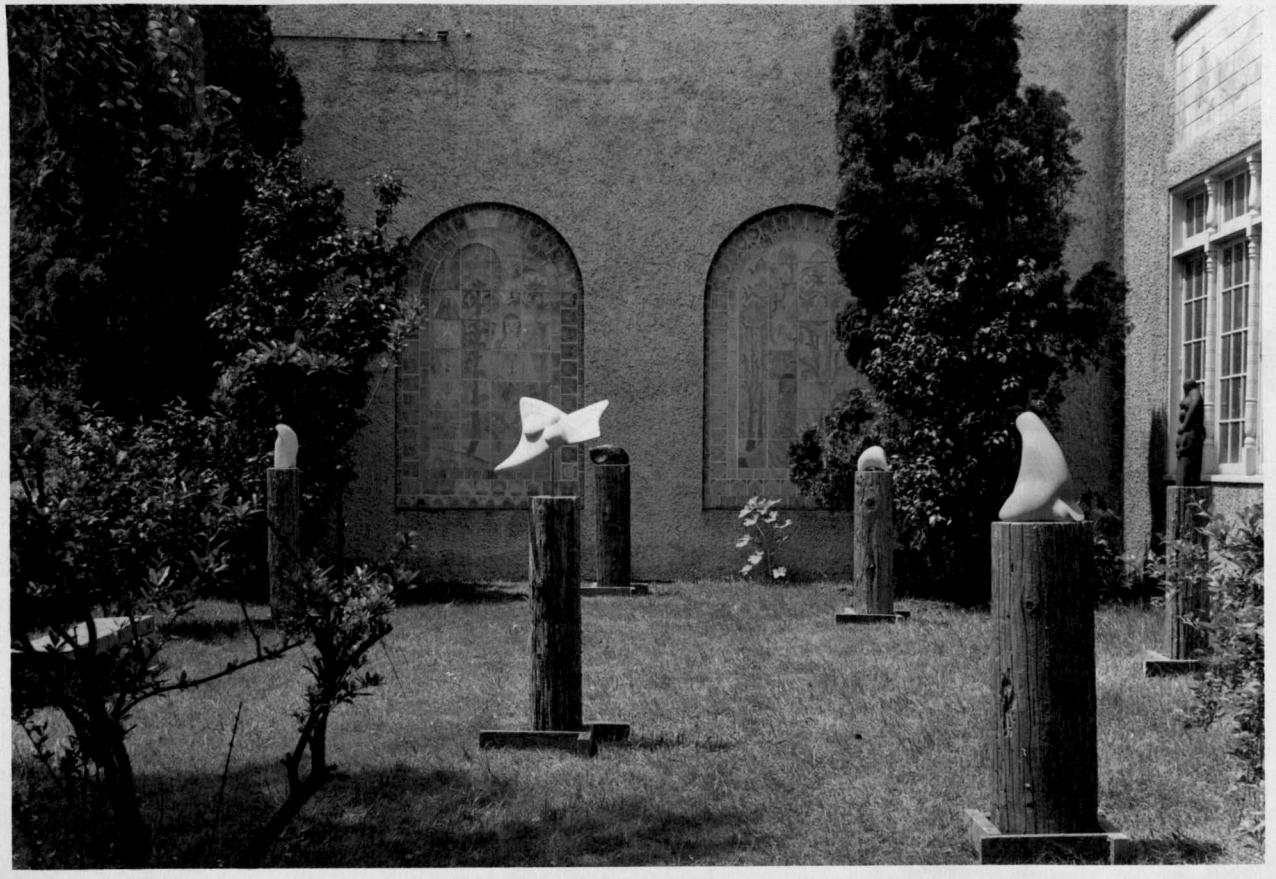

THE EXHIBITION OF THE SCULPTURES OF THIS PROJECT

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INTRODUCTION

Stone carving is one of the oldest of the arts. From the earliest times man has used the permanent native materials around him both to help maintain his existence and to enhance his life. Stone, being one of the more abundant and most permanent of the available materials, was familiar to man and he found he could change its shape by rubbing or striking it with another stone. Thus sculpture was born and man's appreciation for this material was undoubtedly increased.

As time has passed man has changed. He has found many new materials which he used to replace stone or which were used as substitutes for stone. These new materials offered him greater opportunities and the products of these have made it possible for man to progress in his civilization to his present position. However, it seems to me he has lost that appreciation for stone that once must have been so much a part of him. But stone itself has not changed. Relatively few men now realize the natural beauty of stone, its possibilities as a material for sculpture and architecture, and the fact that it does have qualities that cannot be replaced or substituted.

It was partly with this in mind that I chose the subject for my terminal project, "The Carving of Native Stones of Oregon." My previous experiences in the field of sculpture were concerned primarily with modeling in clay and plasticine. Therefore, I felt I could approach

such a subject without prejudice. I also realized how fortunate I was to be located in a region so rich in native materials.

APPROACH

Each of my pieces is an experiment in form and I have felt the most logical approach for me to take was to work with simplified composition of forms and intersections. By proceeding in such a manner I have attempted to build in my mind a sensitive feeling for the structure of form.

As I progressed from one problem to the next I experienced a feeling of competence growing within me. I am not sure each piece I did was better than the preceding one as a piece of sculpture, but I do feel that each has a relationship to the others and is a step forward in the understanding of form.

At all times I have attempted to keep in mind that, first of all, I was carving a design from a piece of stone. I have approached each problem with an open mind as to what would be the best solution for that particular carving. I studied each stone and considered all of its characteristics known to me. I made changes in my original plans in all instances where I felt changes were needed. I have worked with the hope that my pieces would have freshness, strong feeling of life, and that they would enhance the materials in which they were carved.

At the present there are, generally speaking, two methods of carving used in sculpture. These are direct carving and carving from a model. I have used both of these processes; and, judging from my limited experience, have found that each has its advantages, theoretically.

In direct carving the sculptor has the opportunity to study his stone throughout the cutting process, allowing the characteristics of that particular piece of material to suggest and demand their rightful place within the design. This is referred to as a "respect for materials."

On the other hand, in carving from a model, the sculptor works out his design in a temporary material from which he points up his carving into stone. By working in this manner he is enabled to explore many possible solutions to his problem.

Perhaps, however, in the actual working procedure these two processes are not so far apart as one may be led to believe if those artists who hire their carving to be done by a professional stone carver are exempted from the comparison. While the sculptor who works from a model is designing that model there is no reason why he cannot have in mind the stone in which this design is to be carved. If he is an experienced man in the field of sculpture, he probably will know the characteristics of that particular material and will take them into consideration when creating his design. Thus, the sculptor who carves from a model can also have a "respect for material." The change in scale which takes place in pointing up a model is a dangerous pitfall; but, here again, it is something that is familiar to the experienced sculptor and he should be able to make proper adjustments as they are needed. At the same time the direct carver might have a design in his mind which could be as determined as if it were in three dimensions.

As has been previously stated, I used both methods to the best of my ability and perhaps as I gain more experience in the field I will lean more to one or the other than I do at the present. My opinion now is that each person has the right to work in a manner he feels best suited to him.

TOOLS

Throughout this project I have used the standard tools of the sculptor. However, I think it might be of interest to note how brief the list is and how little a person actually needs to do stone carving. In the carving of the stones in this project the following tools were used:

Goggles

Soft iron hammer (weight two pounds)

Chisels (points, tooths, flats, gouges)

Rasps

Coarse carborundium block

Carborundium grit (number 90)

Putty powder

Garnet papers (numbers $\frac{1}{2}$ through 5/0)

Bush hammer

Pocket knife

Gloves

Vise

Sand bag

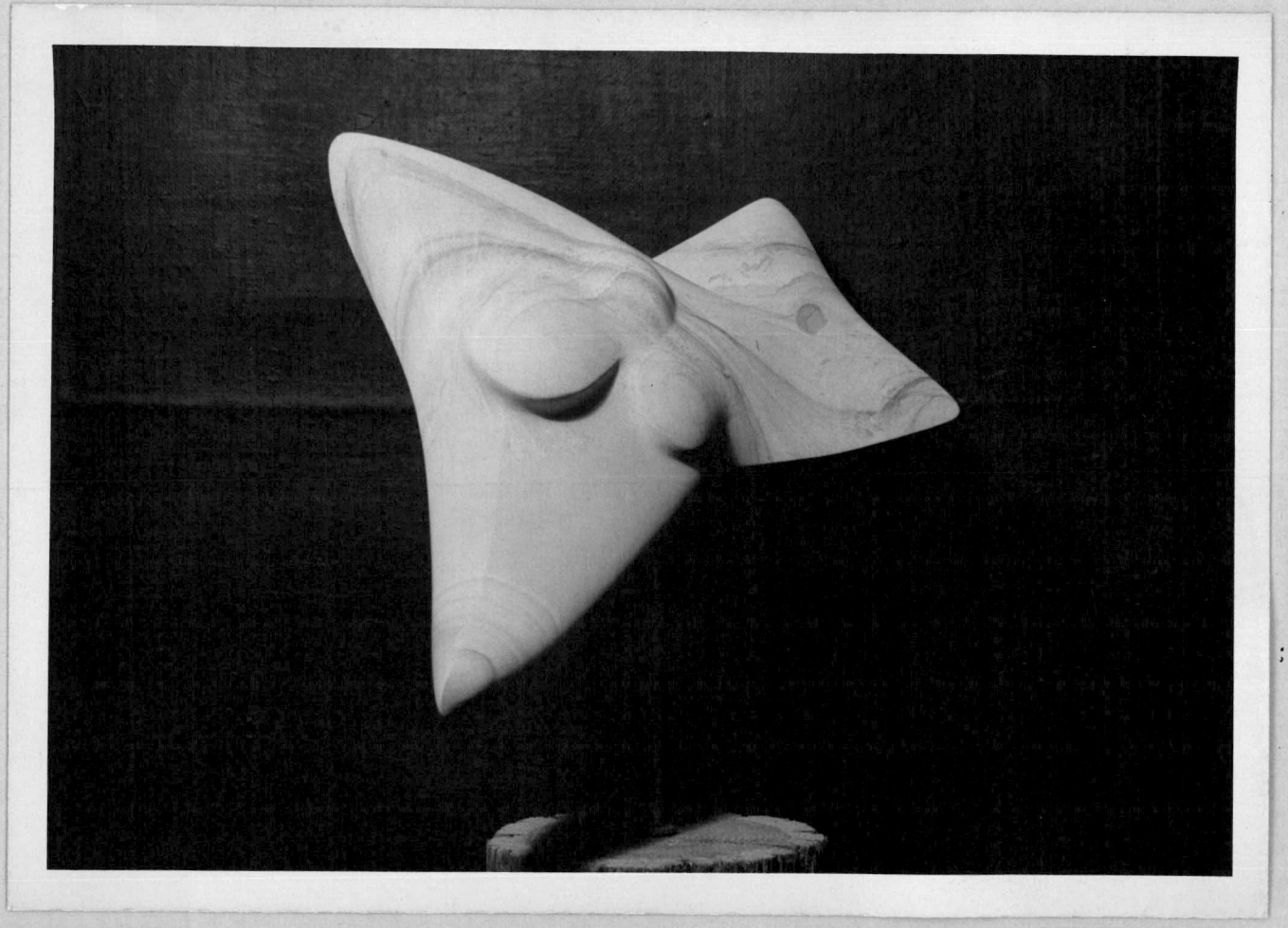

PLATE I. SANDSTONE (BROWNSVILLE). HEIGHT 16 INCHES

MATERIALS AND METHODS

Sedimentary Rocks

Sedimentary rocks are those that are composed of sediments which have undergone compaction and cementation. In their origin they were built up in layers or strata and this stratification is one of their strong characteristics.(1) There are many different sedimentary rocks, but here I am primarily concerned with sandstone and limestone. They are the ones I have carved.

Sandstone. There is considerable variety in the texture and hardness of sandstone depending on the size of the grains and how well they are cemented together. Sandstone has a great range in color which is due to the variable coloring of the cements in which the grains are embedded.(2) This rock is clastic, being composed of the fragments of other rocks which have been broken by nature.

Brownsville Sandstone (Plate I). The Brownsville sandstone which I have used in my project is fine grained and extremely colorful. It is yellow with bands of red brown traveling through it at odd angles. This discoloring was caused, I understand, by the penetration of mineral solutions which have stained the material. I found this to

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(1) Emmonds, William H., and Others. Geology Principles and Processes. New York: McGraw-Hill Book Company, Inc., 1939. 268 p.

(2) Ibid., p. 271.

PLATE II. SANDSTONE (ASHLAND). HEIGHT 15 INCHES.

be a fascinating stone.

In the carving process I used the point, tooth, flat, and a rasp. To finish I used 1/0, 2/0, and 3/0 garnet papers in that order.

The site from which I obtained this rock is located about four miles south of Brownsville. (Map I). This was not a regular quarry but a cow pasture. The bed of sandstone runs just under the turf. I was able to dislodge some fairly large pieces with a wrecking bar, but it will be necessary to do some blasting before anything of size can be removed from that location.

Brownsville sandstone has been used extensively in this department in the past because of its availability and the ease with which it can be carved. I think it serves as a satisfactory material in sculpture and might be used to some degree in architecture. However, the stone weathers poorly and could not be used outside for either sculptural or architectural purposes.

Ashland Sandstone (Plate II). The Ashland sandstone which I carved was found to be quite different in character from that described above. It has a much coarser grain and is harder. It is gray and in the sunlight it has a particularly clean appearance of which I am fond.

While carving this sandstone I used the point, tooth, flat, and attempted to use a rasp, but found it to be true that coarse sandstones and rasps do not work well together. Therefore I used a block of coarse carborundium and finished the piece by sanding it with garnet papers.

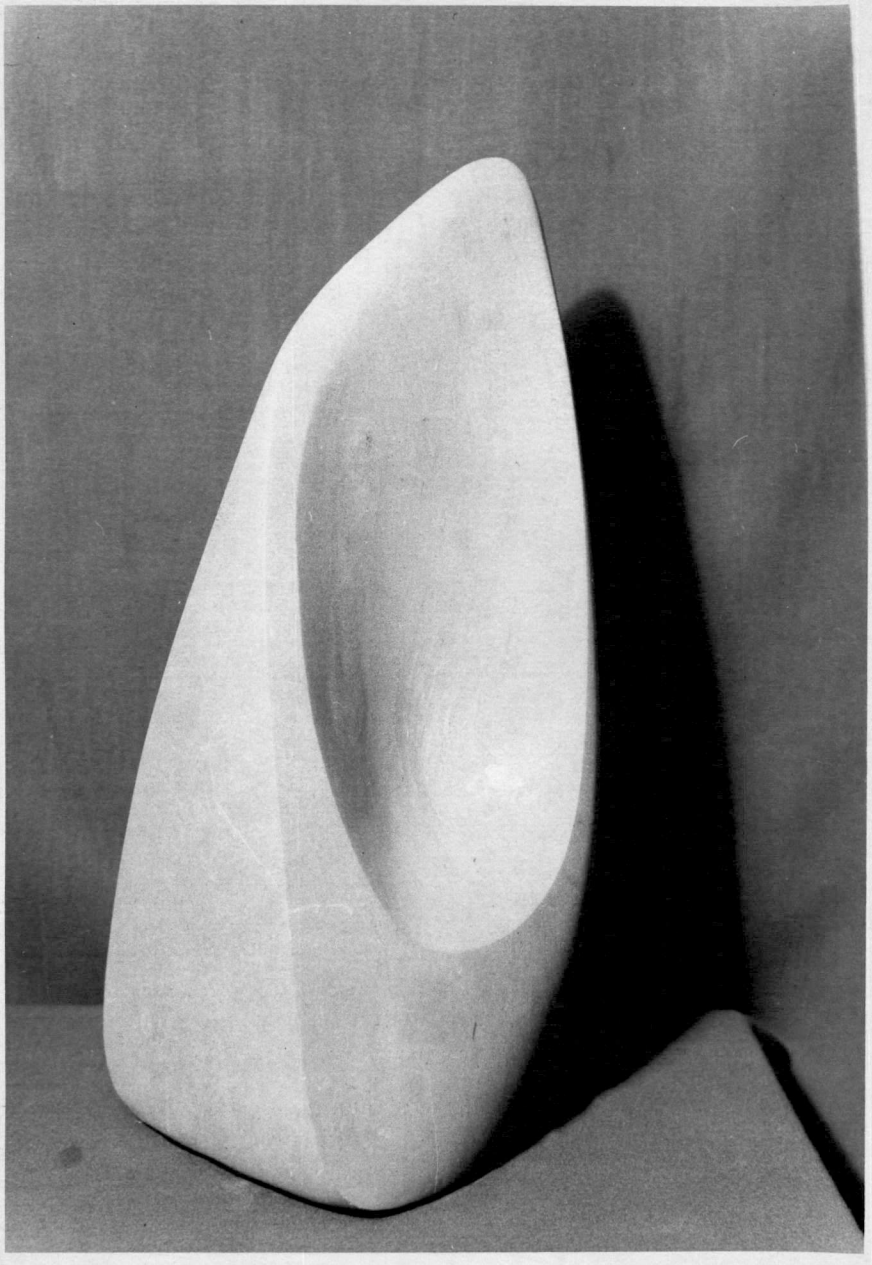

PLATE III. LIMESTONE (DALLAS). HEIGHT 17 INCHES.

I also used a gouge in working the concavity in the front of the figure.

I think this to be one of the better materials used in the project. I found an abandoned quarry of it about six miles south of Ashland (Map II) and I was impressed by the quality of the stone from the moment I saw it. There was much from which to choose and it all looked good. It was a strong, clean looking material with a slight variation in color running throughout the different pieces which were lying about. The surfaces of the pieces showed even fractures and were almost sculptural as they were.

My one carving in this stone is not much basis for an opinion, but I think this sandstone is a material that would merit further investigation. I believe there might be uses for it in the field of sculpture and in architecture. I am sure it would work well in interior work and it may weather well enough for exterior placement.

Dallas Limestone (Plate III). Limestones are sedimentary rocks composed of the material that once formed organic remains (hardness--3). They are classified as a non-clastic material, but often are impure and have some sand or clay in them.(1)

The limestone which I included in my project was found to be dense and brittle. It is dark gray in color. Although it worked

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(1)Longwell, Chester R., Knoph, Adolph, and Flint, Richard F. Physical Geology. New York: John Wiley and Sons, Inc., 1948. 573 p.

down to a smooth finish, it does not have an appealing visual quality. Small portions of the stone are actually of a different material which seem to be igneous in character. These appear as spots on the surface of the limestone and are quite evident.

I used the point and the tooth chisels in my carving, but found the flat to be ineffective. I used a gouge in working the concave form on the one side and relied on a rasp for refining all of the forms and intersections. Varying grades of garnet paper were used to acquire a finished surface.

Of those I visited, the quarry at Dallas was the only one in actual operation. (Map I) It is located about five miles southwest of that city and all of the stone removed is being calcined and used for agricultural lime.

Upon inquiry I found that this stone had never been used in connection with architecture. However, from a nearby quarry that preceded this one, stone was cut and used in the buildings of that region with satisfactory results. I believe that some of the hardness and brittleness in the stone which I worked was due to its having been quarried and left exposed for a lengthy period. However, I suggest that more research be done before recommending this material for either architecture or sculpture.

Metamorphic Rock

A Metamorphic rock is a sedimentary, igneous, or a pre-existing metamorphic rock which has been altered by heat and pressure. How this

PLATE IV. MARBLE (WALLOWA). HEIGHT 7 INCHES.

metamorphic rock differs with its original state may vary according to the degree of metamorphism that has taken place, however, generally the alteration has been so complete that the original characters have vanished and the metamorphic product is to all appearance a new rock.(1)

Marble. Marble (hardness--3) is the only metamorphic rock with which I have been concerned in this project. It is a recrystalized limestone and is a product of the alteration process referred to as hydrothermal metamorphism.(2) In geology the term marble is reserved for those metamorphosed limestones, the crystalline structure of which may be seen by the unaided eye. In commercial practice any limestone or marble that will take a polish is called a marble.(3)

Wallowa Marble (Plate IV). When this marble was given to me I was informed that it contained many impurities. That, plus its having been quarried long before, may account for its having been so brittle and hard. It fractured in an irregular manner and did not seem to have the crystalline structure which is typical of marble. The color of this piece is predominently coal black with an even distribution of small white shell-like forms throughout. I found this to be one of the most interesting pieces to carve because of the color contrast and because it was a material which could be highly polished.

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(1) Ibid. p. 574.

(2) Emmonds, William H., and Others. Op. cit. p. 387.

(3) Longwell, Chester R. Op. cit. p. 576.

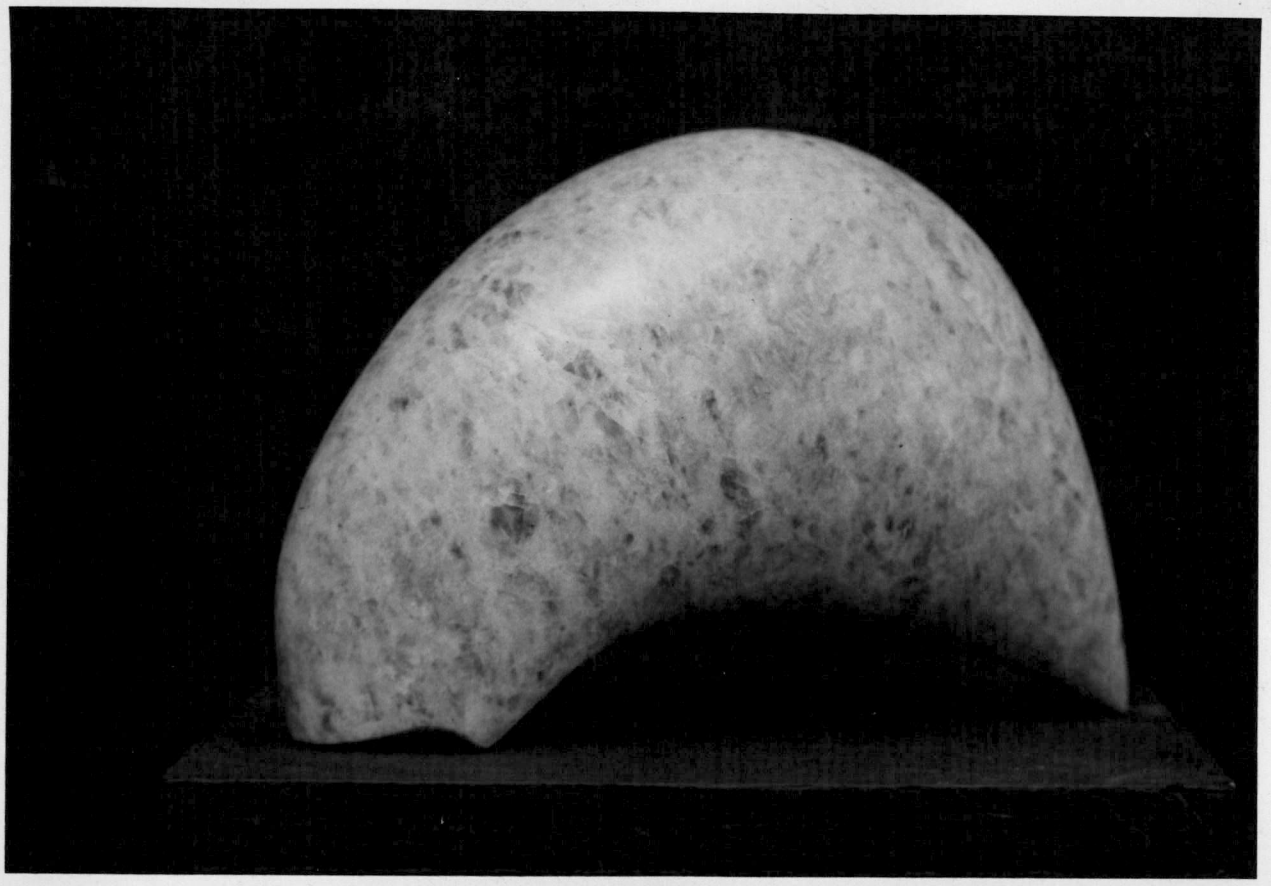

PLATE V. MARBLE (WILLIAMS). HEIGHT 8 INCHES.

In carving this piece I used the point and the tooth, but found the flat to be as useless as it had been on the limestone. Therefore, I used a rasp, garnet papers, and carborundium to bring the surface down to a smooth finish. I polished it with putty powder and received quite a thrill when sharp reflections could be seen on its surface.

I was unable to obtain this material at its natural site because of the distance between Eugene and the Wallowa Mountains where it is located. (Map III) However, I was given a piece by the geology department here at the university and was told where it had been obtained. The quarry is not in operation at this time, but the site is about four miles southwest of Enterprise.

I would certainly recommend this material for further investigation, if it were possible to obtain it freshly quarried and of more consistent properties. I believe it might have fine possibilities as a material for both sculpture and architecture.

Williams Marble (Plate V). The structure of this stone is indeed peculiar. The crystals are very large and in a most irregular pattern. In addition to this irregularity, the stone is hard, but of low density. These combined properties make up a material that is weak and unreliable. Large pieces will part for little or no reason from the main mass during the carving process.

In carving this piece I used the point and the rasp plus a block of coarse carborundium. The tooth and the flat were ineffective. I sanded the surface, used carborundium grit and polished it with putty

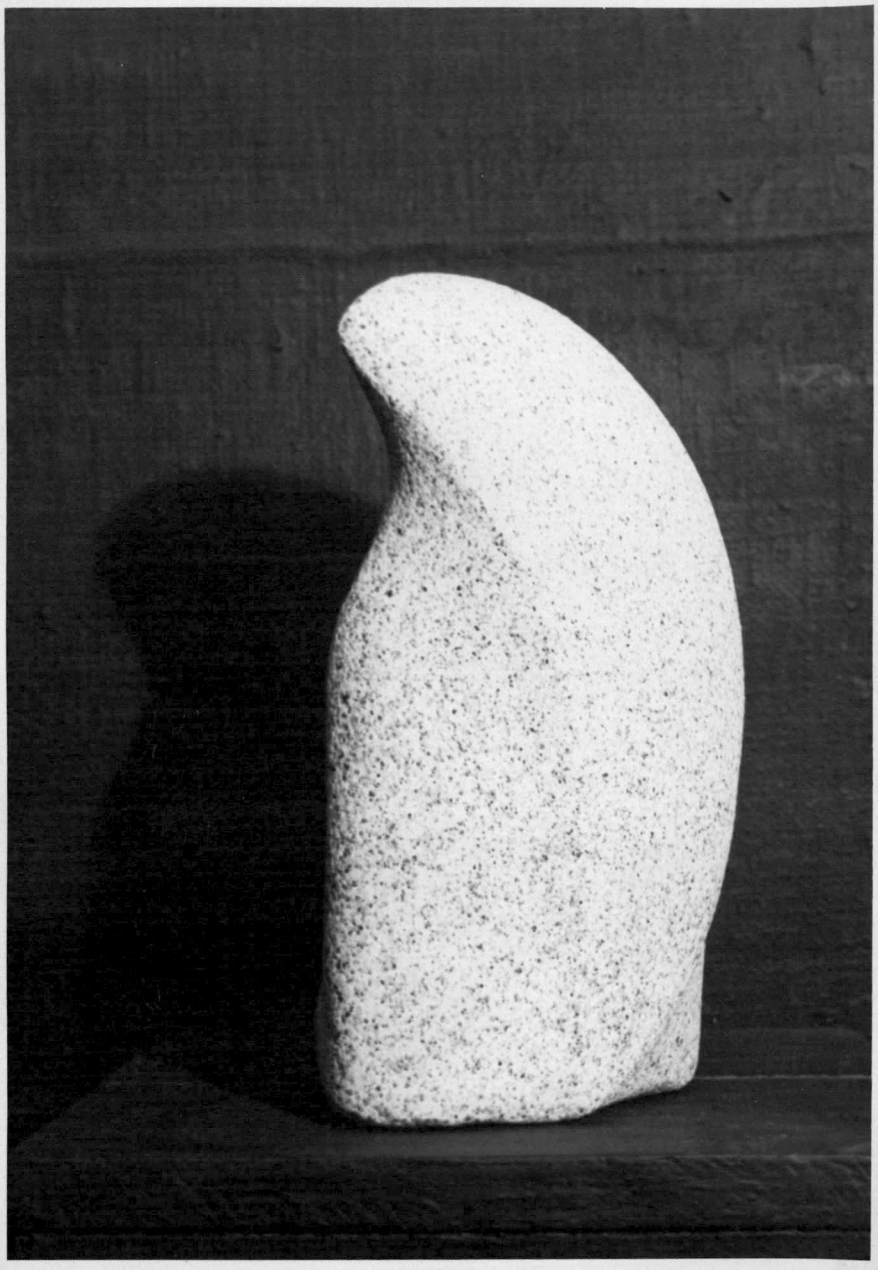

PLATE VI. GRANITE (ASHLAND). HEIGHT 12 INCHES.

powder. The stone, gray in color, took a fine polish. I think it is quite interesting, too, because the polish gave the piece a transparent quality which enables the observer to clearly see the structure of the material.

I obtained this marble at a quarry near Williams which was not being operated at the time. (Map II) Practically all of the stone had been removed, allowing little choice as to what I brought back. This stone was being calcined and used for agricultural lime.

I would not recommend this material for use in either sculpture or architecture. However, I have seen samples of fine, even grained marble that were taken from this quarry and I believe there might be considerable variation in the quality of the rock removed at that location.

Igneous Rocks

Igneous rocks are formed at high temperature. They are made by the solidification of molten matter that originated within the earth. These are divided into intrusive and extrusive rocks.(1)

Ashland Granite (Plate VI). Granite is an intrusive rock (hardness-7) in that it is formed below the surface of the earth. The rate of the cooling of the magma determines the size of the crystals in granite. If the magma cools rapidly from many centers, the crystals are small. All of the constituents of granite can be seen by the naked eye.(2)

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(1) Ibid. p. 283.

(2) Ibid. p. 301.

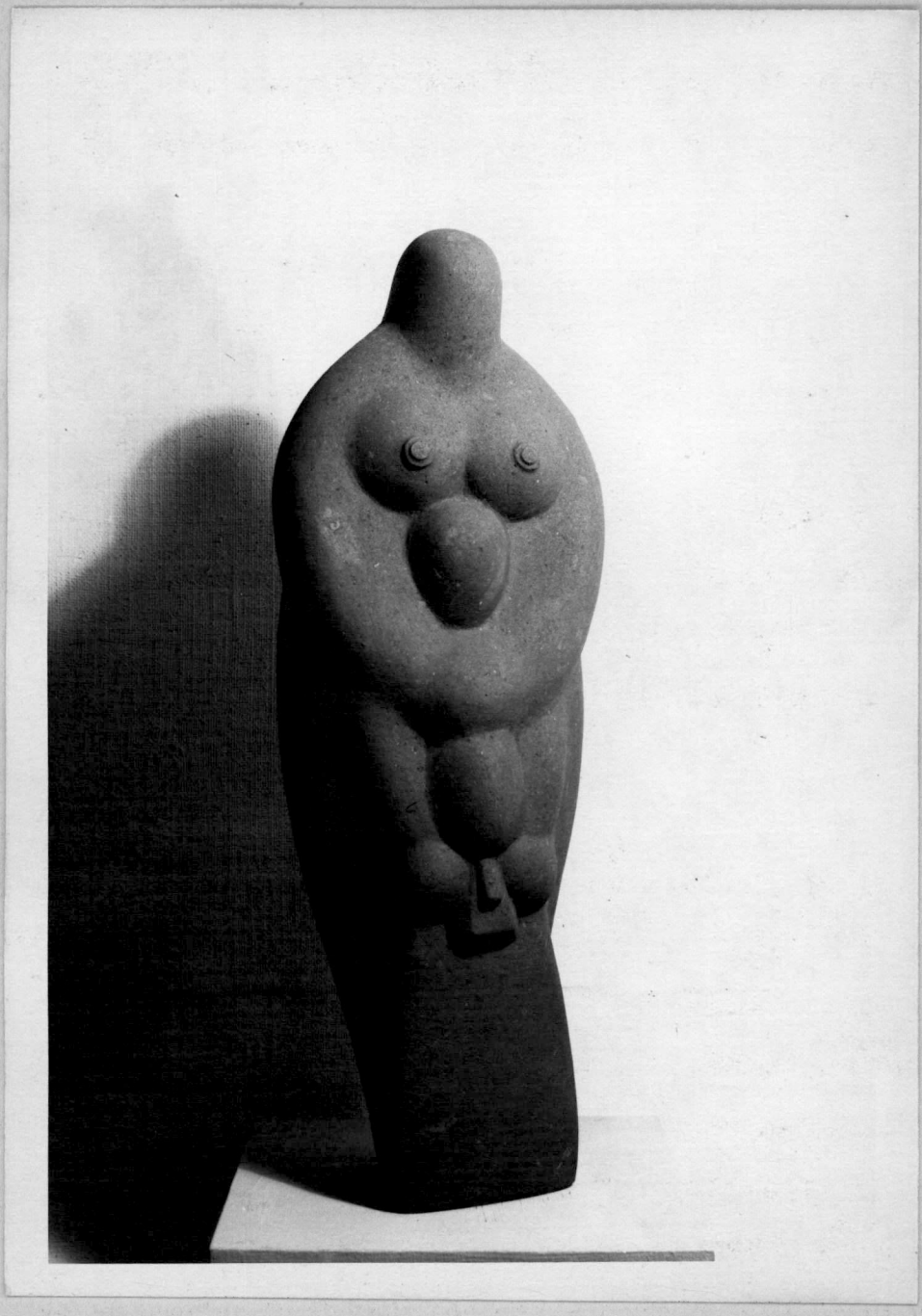

PLATE VII. TUFF (TUMALO RESERVOIR). HEIGHT 26 INCHES.

The piece of Ashland granite which I used in my project is fine-grained. It is predominantly white with the black mica giving it a salt and pepper effect.

For carving in this material it was necessary for me to select a number of the heavy pointed chisels which were on hand and have them re-tempered and drawn out to a blunt point. The process of roughing out the granite did not differ from the general procedures used on other materials. Large corners and edges could be broken off with ease, but to cut into a flat surface it was necessary to cut parallel furrows and then remove the high areas between. I used a bush hammer to develop the forms and allowed the surface to retain the frosted texture which was the result of that operation.

I obtained the granite about five miles south of Ashland at a quarry that was in operation until 1949. (Map II) The stone from this quarry had been used for tombstones.

I believe it does have qualities that would make it a good medium for either sculpture or architecture and could be used in either the interior or exterior of buildings. The color is interesting with the dark mica forming a contrast against the light minerals.

Tumalo Reservoir Tuff (Plate VII). Volcanic tuff is an extrusive rock. Extrusive rocks are those that are formed by the magma which flows from an opening in the surface of the earth. Magma is extruded in two ways: the quiet, in which it is discharged as a flow of lava; and the explosive, in which it is blown into the air in the form of

hot liquid lava or fragments of cold solidified magma that has been dislodged from the crater walls.(1)

This tuff (hardness-1.5) from the Tumalo Reservoir area is composed of dust like particles which were blown from the opening when the volcano erupted. This material was distributed by the wind and formed beds on the surface of the ground within a range of twenty miles or so from the volcano.

This is a fine carving material. It is soft and easily worked with nearly all tools including a pocket knife. I used the point, tooth, flat, and gouge and found each to do its job effectively. There are phenocrysts distributed throughout the material and they add a spot of contrasting color to the dark body of the tuff. However, these phenocrysts are of a much harder nature than the compressed dust in which they are inclosed and are easily dislodged when working down the surface. However, they are soft enough to be controlled by using a sharp rasp. It is possible to sand the surface of this material with great ease, but the stone retains a dusty appearance. I have experimented with oil and wax as coloring agents for this material and have obtained some results which I found to be pleasing. My intention was to change this normally gray, dusty, and indistinct material to a black in which the form could be more clearly seen and also give a better contrast of color with the phenocrysts that are exposed to the surface.

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(1) Ibid. p. 293.

The location of the site where I gathered this rock is close to the Tumalo Reservoir. (Map IV) This rock has been previously used here in the sculpture department. It has been found to be a reliable, soft, light weight material and is available in great quantity and in large pieces. I have been told that in the vicinity of Bend it has been used as a building material with satisfactory results.

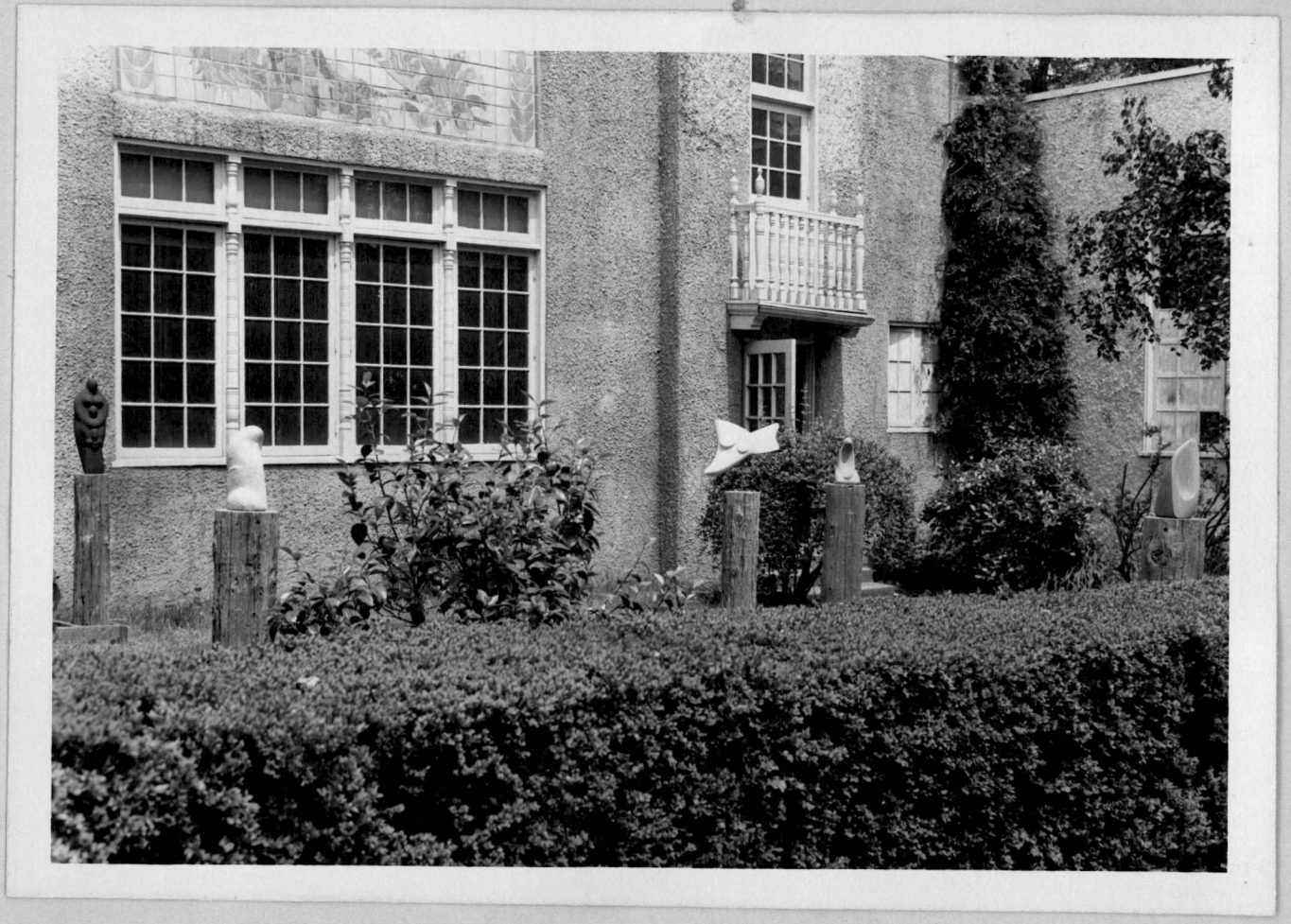


PLATE VIII.

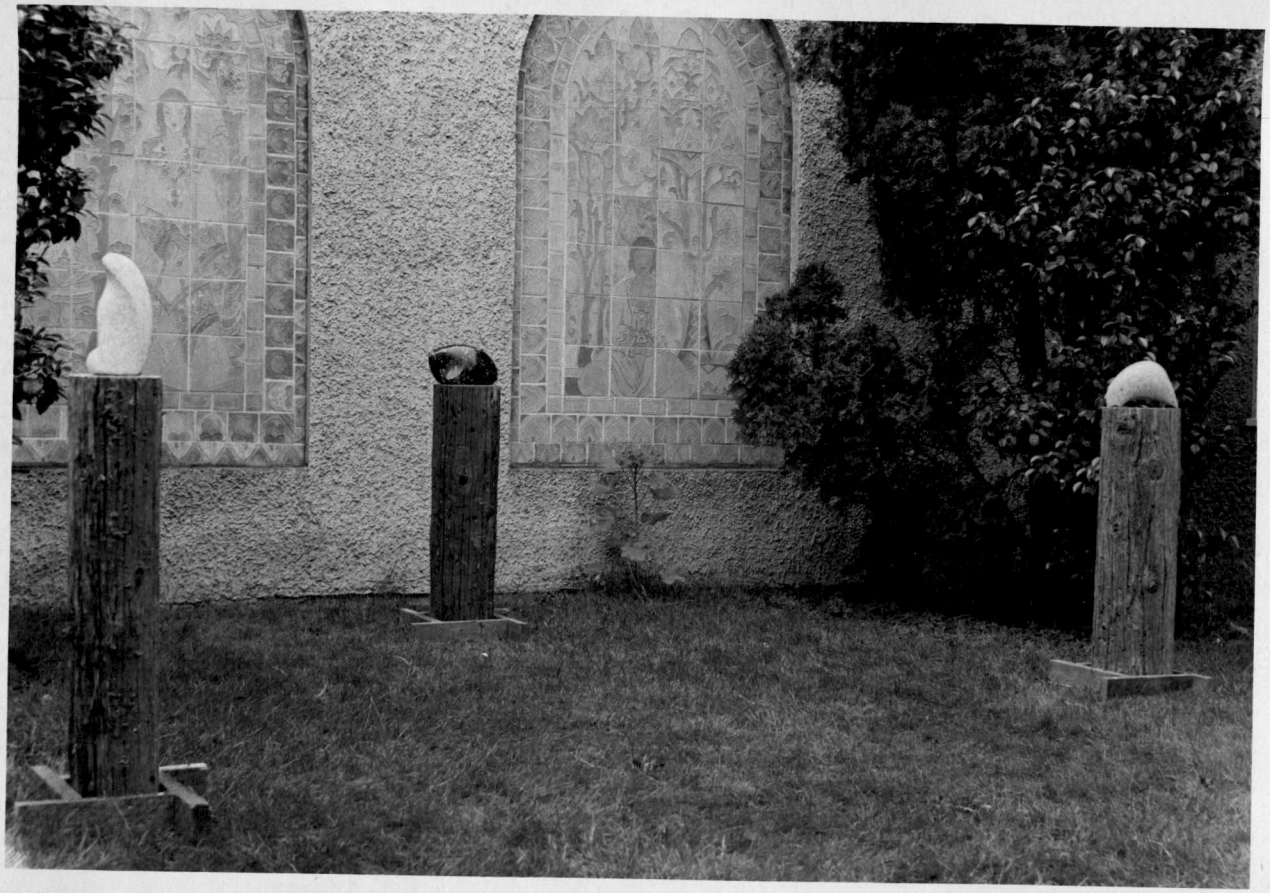


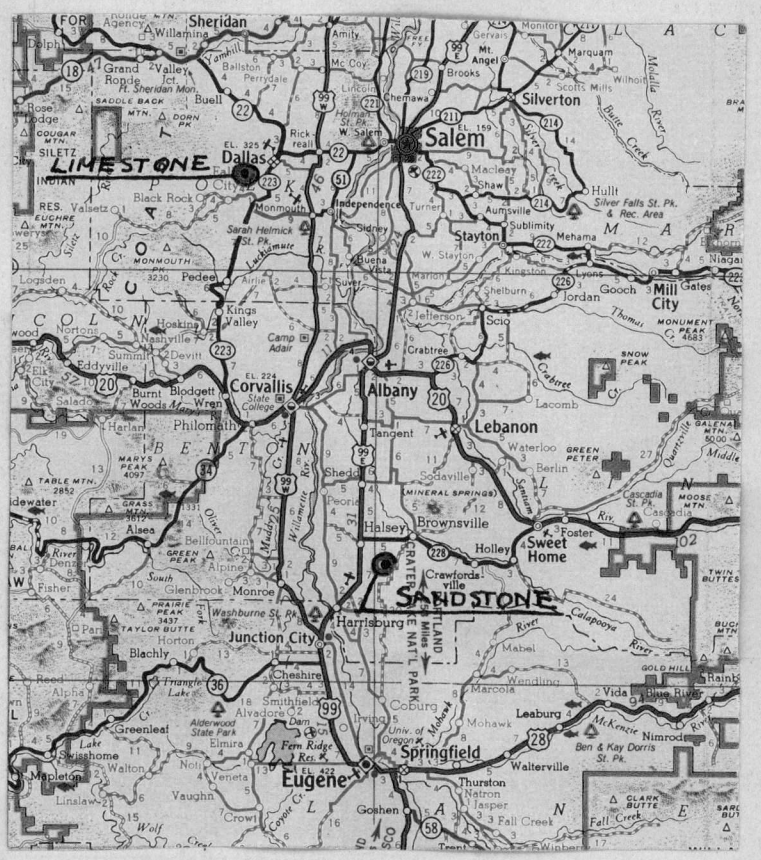
PLATE IX.

CONCLUSION

Oregon is rich in native materials that might be satisfactory media for sculpture and architecture. In addition to those I have used there are many others that I think would merit investigation. There are various granites, marbles, sandstones, limestones, and extrusive volcanic rocks located throughout the state. Because Oregon is so young in her development, most of these materials have been used in a limited way in the past. But due to our modern way of life we do have easy access to their locations by good roads and fast transportation.

In reference to the stones carved in this project I believe the Ashland granite, the Ashland sandstone, the Wallowa marble, and the Tumalo tuff may have value as materials that could be used for architecture or sculpture in either interiors or exteriors. From my limited experience with them, I would rate their value in the order in which I have named them. The Brownsville sandstone weathers poorly and therefore it would not be suitable for use in a position where it was exposed to the rain and frost. The Williams marble and the Dallas limestone I would not, without further investigation, recommend for either sculpture or architecture.

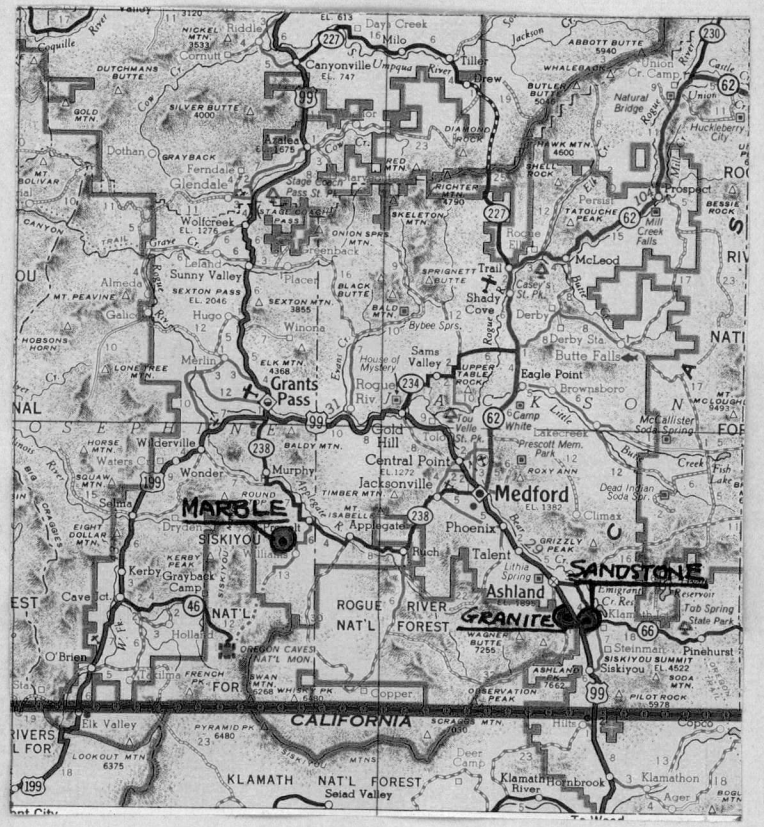
I have found this investigation to be interesting. I hope that in addition to the experience I gained by collecting and carving these stones, I have awakened in others the desire to use these materials and to investigate those which have not previously been explored.



MAP I

Brownsville Sandstone

Dallas Limestone

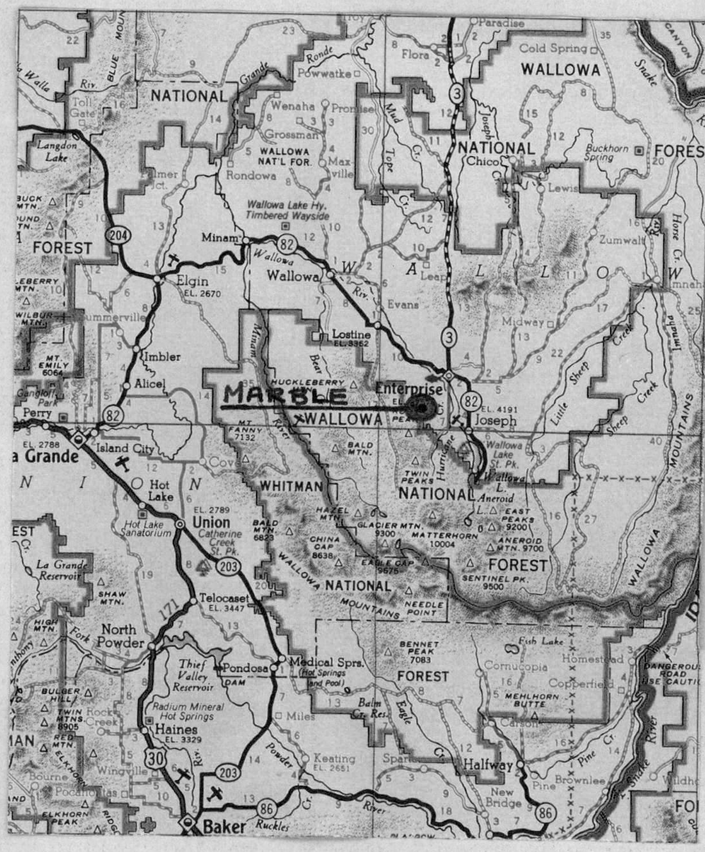


MAP II

Ashland Sandstone

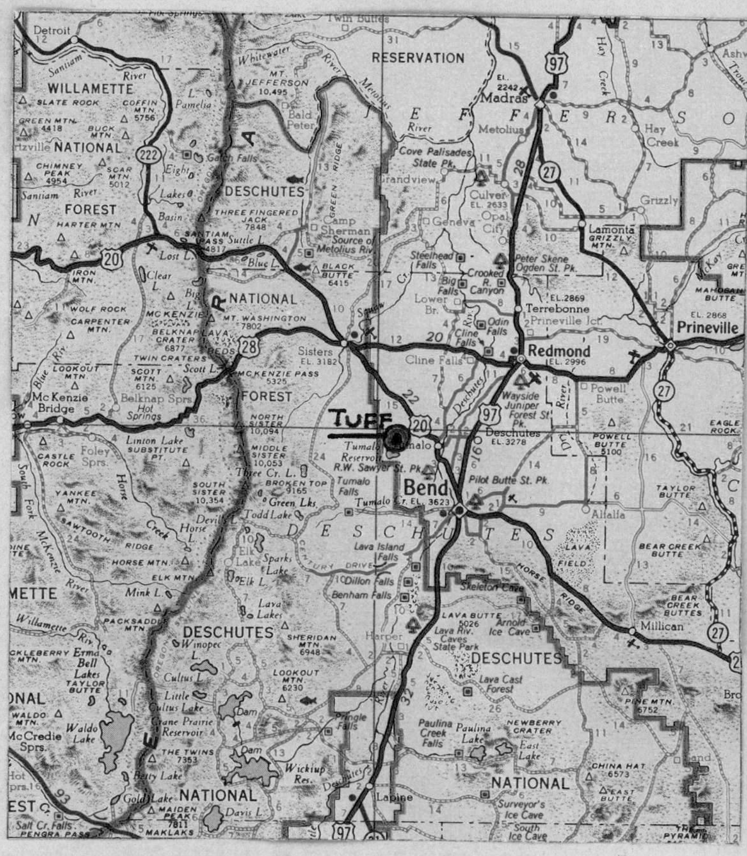
Ashland Granite

Williams Marble



MAP III

Wallowa Marble



MAP IV

Tumalo Reservoir Tuff

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