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Landscapes in gum

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LANDSCAPES IN GUM

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I. INTRODUCTION

There is nothing in nature that is not in us. Whatever exists in nature exists in us in the form of our awareness of its existence. All creative activities of mankind consist in the search for an expression of that awareness.

There is in photography a new attitude towards the photographer's task of what to look for. We must accept the fact that what we perceive with our five senses is not the only reality existing there. We must further accept the fact that life and nature conceal an infinite variety of forces and depths never seen and only faintly felt. These have to be expressed through some kind of understandable image.

The purpose of this thesis project is to emphasize the distinct individual characteristics of the photo image as revealed through the gum-bichromate process.

"A process wherein the greatest value lies in its power to eliminate the undesirable, to suppress the unimportant details, and to emphasize points of special interest; and consequently favoring, in a unique manner, the exercise of personal taste and artistic feeling regarding the photo image."¹

The subject of the thesis is the natural landscape and most of the pictures were taken in Colorado and Nebraska. Through these gum-images, I have tried to capture the many contrasting characters of the earth: its strength in form, its depth and force; while, also, showing its softness, its delicate textures, its fantasies and dreams.

Each image was produced through the gum-bichromate process.

"When paper coated with a mucilage of gum arabic, potassium or ammonium bichromate and the desired pigment is exposed to light through a photographic negative and submitted to water, an image will appear if the paper is worked upon with a brush or sponge."2

During the 1971 Spring quarter, experimentation in the process was begun under the supervision of Judy Steinhauser and research begun under the direction of Tom Barrow at the Eastman House. Both experimentation and research were continued throughout the year of work and will be reviewed in the next section of this paper.

2 Holme, Charles; Art in Photography, London, M.C.M.V.
II. THE TECHNIQUE

A. Calendar of Procedures


September and October 1971: Began photographing landscapes in Colorado and Nebraska. Experimented with the gum solution.

November and December 1971: Did some photographing in Wisconsin and Nebraska. Experimented with the coating solution, exposure and development of the print. Began the actual printing of the thesis.

January and February 1972: Evaluation with my advisors concerning the work. More long printing sessions.

March and April 1972: Selection of the most successful prints. Matting them for display.

May 1972: Exhibit

B. Review of Research and Experimentation

September and October, 1971.

The working solution itself was the subject under experimentation during these first months. This involved the gum solution, the bichromate sensitizer, and the pigments. Demachy, Richards, Warren, and Whipple all offered advice concerning these subjects.

"The more gum, the more brilliant the result. Larger portions of gum can be used for landscapes to secure brilliancy, not so with portraits. If the bichromate is reduced to a minimum, longer exposure will be necessary. Exposure is most affected by the composition of the sensitizing solution; its thickness and its application to the paper." 3

3 Demachy, Robert; Photo-Aquatint or the Gum-Bichromate Process, Hazell, Watson, and Viney, LD. 1898.
"Increase of acidity really means a decrease in the exposure time, as the gum is already partly insoluble before its exposure to light begins. The gum is in its most soluble condition when freshly made." 4

"The gum is soluble in cold water. Heating changes its composition. The dilution is 30 to 35 grams of gum dissolved in 100 cc of water with the mercuric chloride already in the water as a preservation. Tie the gum in a cheesecloth bag and let it dissolve over a 1 or 2 day span. Either tube water colors or dry pigments may be used, with equally good results. All pigments whether tube or dry should be taken by weight and a record kept of the amount used in each lot of mixture until you arrive at the proportion best suited to your manner of working. Potassium dichromate is the salt with the smallest concentration of the dichromate ion, so it is the slowest printing. Ammonium dichromate has the largest number of ions and is preferred by those who use artificial light. Dilution is 29 grams of the salt to 75 cc of hot water and when dissolved fill to 100 cc of water. At 68 degrees it remains constant." 5

"The dilution of the gum is 2 oz. of gum arabic to 5 oz. of water. The dilution of potassium bichromate is 2 oz. to 2 oz. of water and can be stocked for some time. For pigments powder is best. A nice scale of colors can be had with only red, burnt umber, ochre, indigo, and Perussian blue. Don’t mix black with anything. Grind powdered chalks or pastel crayons for rich soft colors." 6

After having studied and worked in the styles and techniques of these photographers, I began my own experimenting. Throughout September and October I made various solutions of the gum; fresh solutions, old solutions, acid solutions, and solutions with too much gum or too much sensitizer. I crushed chalk for pigment, used old tempera, new tempera, water colors and pastel crayons. After working through 18 different solutions, I came up with the best working formula for my purposes and since that time have had almost constant success with controlling the gum solution. The dilution of the gum is 1 oz. of the gum arabic to 2½ oz.

of water which produces a consistency similar to honey. The bichromate
dilution is \( \frac{1}{2} \) oz. of the ammonium dichromate to 5 oz. of water. Then I
use an equal amount of each of these stock solutions along with the
desired amount of pigment. I use tempera when I want a matt finish and
bright colors, and water color pigments when I want a glossy finish and
pastel colors. The crushed chalk streaked.

During the latter part of October, I used a book of sample papers
and found Rives and Arches Text papers to be the ones I use for gum
printing mainly because of the way the gum responds. It is hard to
always get the particular paper you want so it is wise to have a couple
to choose from. Before using the paper I always sized it with the
genamine and formaldehyde solution after pre-soaking for 15 minutes.

November and December.

After all the experimenting was over, I could depend on the gum
solution to work and proceed with the actual printing. During this time,
I was mostly concerned with coating the paper, exposing it, and developing
it. Again I studied the research material which dealt with the areas of
coating, exposing and developing the print.

"With a fan shaped brush smear the sensitive coating
over the paper; do it as rapidly as possible, and the
moment the paper is rubbed all over take the soft
brush which is dry and clean and give it final strokes
from top to bottom. In reality an over-exposed print
is one that cannot be washed up to the desired effect;
and under-exposed print is one which will not retain a
sufficient quantity of the pigmented gum. Very hot
water will be used to develop the darkest shadows, luke
warm for the intermediate values and cold water for the
delicate half tones. This is extremely delicate work
and you could ruin your print anytime by the tempera-
ture of the water or the brush strokes you use."?

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?Demachy, Robert. *Photo-Aquatint or the Gum-Bichromate Process*,
Hazell, Watson and Viney, L.D. 1898.
"If the sensitizer and pigment are coated on together the exposure is longer. Increased gum will need a longer exposure. Over-exposure and forced development lower the number of tones available but obtain a finer grain and greater softness. A thick coat will need a longer exposure; and when you use reds and browns a longer exposure is needed.\(^8\)

Factors which may modify the printing time are thickness of coating, concentration of pigment, and humidity of the air. The simplest and surest way is to make use of test strips as is done in making enlargements. The color of the pigment has no effect on the exposure. Multiple printings are made with full strength pigment reducing the exposure a little each time. Development can be up to two hours if you have the patience. A gentle stream of water may be used for local reduction while the print is laying face up in the development tray with the surface just under the water. Brushing is useful for clearing the highlights. The slight yellow stain of the bichromate left in the paper can be removed by soaking the print in a bath of potassium alum 30 grams to the liter of water. Then wash for 15 minutes.\(^9\)

Each of these men has many suggestions to offer anyone who works in gum-printing, especially hints on exposure and development. It is in these areas, however, that one's own experience is the best teacher. When I actually make the exposures, I am aware of what an over-exposed or under-exposed gum print really looks like. Likewise, when I develop print after print, I realize that this is the real "decisive moment" of gum printing. It is here that one's own "style" and personal judgement really come to the fore. At this stage the artist has the power in her hands to lighten or darken areas, let the detail come through or keep it concealed, remove the color or leave it on, or maybe brush off the whole image and begin again.

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During these two months, I was not only concerned about the exposure and development but also, on how I could make my Kodalith negatives continually better. I wanted the positives and negatives I used to show the greatest amount of detail possible and to render a full range of half tones. I found that if I developed them in Dectol rather than the A & B Kodalith Developer, that I would get a fuller scale of half tones. I concentrated on images that were not complex with detail but rather contained a combination of bold forms and complementing textures.

**January and February, 1972**

During these months the technique was no longer at the experimentation level and I was free to study the images and see exactly what I was doing with them. I found myself making many more decisions about what was happening to the image. The exciting part was that now I had the control to make it whatever I wanted it to be.

Movement began to appear consistently in the work and brought very much life to the static landscape images. This occurred because of the mis-registration of the negatives during printing. I gave each print at least two or three printings; sometimes with the same color and other times with a different color. When the same color was used over and over, the tones became richer which added depth to the image.

Although the feeling of movement was exciting to see, it became rather mechanical in places which can be boring. It was suggested that I study some Japanese woodcuts to see how they blocked off areas when applying color to avoid mechanical repetition. This helped very much and I was able to apply it to my work. I also tried using color in local areas in contrast to covering the entire sheet with the emulsion. The use of colors that are close together on the spectrum added subtle color changes which made the prints very exciting to ponder.
Selection was now the task at hand. Out of the 50-60 gum prints made, which ones did I think the most successful? In choosing I wanted each phase of the project represented, i.e. the mechanical movement prints, the ones with local color, as well as the complex and the simple prints. I did in the end, conclude that the more successful images were the ones that were made richer in experience and more unique because of the gum-bichromate process.

The matting and preparation of a print for display is a critical stage which can help or hinder the success of an image. Keeping this in mind I began thinking about which color of matts would best complement the prints. Having seen many of the prints in white matts I was convinced that white was not the color. I chose three colors: gold, tan and avocado green, because these were the actual colors of the prints or would surely complement the colors in most of the prints. My purpose here was to get a frame around the prints that would not be in competition with the image itself but would subtly complete the edge of the print taking nothing from it but supporting the statement. And, in this, the colored matts were successful.
III. THE IMAGE

There is a unity of nature which is sometimes hard to understand as we look at an expansive landscape. Our eye can see the whole of the scene before it — while the camera must isolate and choose. The photographer as any other artist must work for simple statements in his imagery. If he lets an image get too complex — containing all that can be said about the subject — he runs the risk of depriving the image of that sense of mystery and wonder which very much adds to the final effect.

A. The Problem of Vision

Vision itself is a mode of thinking. When we see, we interpret the world around us. Sharpening our awareness, heightening our sensibility, disciplining our vision, will increase our power to understand the world and then, in the end, communicate what we have seen and felt.

To only look at something is not to understand it. We must study and search out its meaning. Where there is understanding there can, also, be communication. When working with images, the artist attempts to communicate his awareness or understanding of the object. He more often depicts the inner world of man than the likeness of particular objects, making visible and external their experience in connection with the world around them. But the general public still assumes that art is a naturalistic representation.

When I first began to work on this thesis project about a year ago, I was not very aware of what it meant to interpret the world around me. Now that I have worked so constantly in this one direction, my work has revealed in me a desire to search deeper into the image and make it all my own statement. After deciding on the landscape image, I more and more
affirmed the decision I had made to reproduce that image through the gum-bichromate process. I could really take the image and look at it anew giving it the mood and atmosphere that I thought would best communicate it to others.

Many decisions confront the person who works with gum-bichromate printing. The "decisive moment" when the image is first recorded on film is followed by many processes, any of which can alter the final effect or mood you want to communicate. The gum solution, choice of paper and its size, coating the emulsion, length of exposure, the light source, style of development, use of color, and the number of printings are just some of the decisions that add or subtract from the final message communicated. There are many chances to stop or to continue printing, which all adds to the challenge and excitement of the gum process.

B. Relationships

Images are the starting point of all our thinking and feeling. Through images we participate in the world, responding emotionally to its qualities and rhythms. Through images we become aware of the world's forms and structures. Image-making is basic in enabling the human mind to grasp the nature of our surroundings. "Making pictures brings those images out of men's minds and communicates them to others.

The relationship of lines and shapes have become very important to me in working through this thesis project. I have become more aware of how lines can convey the experience of movement and change; how shapes can remain on the surface or take on real form and depth through the use of color; and how the rhythm of the textures can be most effective when varied.

Art attempts to discern order relationships in nature. The landscape offers many contrasting life forms - some soft and graceful
surrounded by flowing lines filled with texture - while others are more solid with heavy forms showing the strength of the earth. All through the country these contrasts are repeated over and over. The ordering of the image comes when you decide which forms and shapes you will put together and then later a decision on how you will further the experience in the photographic process you chose. The gum-bichromate process gives the photographer many more choices and decisions about his work than a print made using the silver or iron process. The reason for this is mainly the use of color and secondly the photographer's power to eliminate or suppress unimportant details and highlight the special points of interest through development and exposure of the print.

The color, sometimes complex, sometimes simple, gives life and movement to the static forms. Color adds continuity and order to a scene that might otherwise fall apart because of the many individual shapes and patterns. A vital factor in most of the work is the creation of movement through the relationship of shapes and textures in space. Not only movement across the surface of the paper but depth can be added through the advancing and receding of the layers of the color. I, also, found certain colors kept changing in tone and depth in terms of value of dark and light when related to other colors. The same color when used with only a slight variation in tone could subtly add depth without shocking or taking away from the whole effect. Such relationships are the things that made each print successful or not successful.
V. CONCLUSION

The world has its own dimensions of light, color, space, forms, textures, rhythms, and movement - a wealth of qualities and sensations to be apprehended and experienced. If we relate experience to experience, image to image, we can bring our environment into focus and become more aware of the differences and variations which continue to survive side by side. Our environment has much to offer us and "we must not narrow the universe down to the limit of our understanding, which has been men's practice up to now, but our understanding must be stretched and enlarged to take in the image of the universe as it is discovered."10

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Whipple, Leland, *The Gum-Bichromate Process*, George Eastman House Library,

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"Figure in Landscape" George Eastman House, Rochester, N.Y. 1971.
Chart #1

This chart shows some of the results of the experiments during the months of September and October. There were 18 various solutions made. Exposure was for 35 minutes under a 200 watt bulb. Development for 30 min. in cold water.
<p>| | | | |</p>
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<tr>
<th></th>
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<tbody>
<tr>
<td>5</td>
<td>crushed chalk, more water than gum, (\frac{1}{2}:\frac{3}{3}), very thin</td>
<td>same</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>new watercolor, same mixture as</td>
<td></td>
<td>new tempera, same as 1</td>
</tr>
<tr>
<td>7</td>
<td>crushed chalk, mixture was never refrig. - after 2 days water cloth was added</td>
<td></td>
<td>old tempera</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
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</table>
Chart *2

The right side of this paper was soaked in a very diluted solution of alum. The purpose was to remove the yellow ammonium dichromate stains and restore the original color of the pigment.
Chart #3

Here are some samples of paper that I used to determine which kinds worked the best with the gum solution. Arches text and Rives were the best and easiest to purchase.
FABRIANO BOOK
19 x 26

TOVIL
15½ x 20½

MORIKI 1018
25 x 36

CROWN & SCEPTRE

HAYLE

IYO GLAZED

RIVES

INOMACHI
20 x 26

ARCHES TEXT
White Wove
25½ x 40
Also stocked in
Laid Finish

No. 4
Slides of the Thesis Prints