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Pottery Making Possibilities of The Clays of Ellis County, Kansas

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POTTERY MAKING POSSIBILITIES OF THE CLAYS OF
ELLIS COUNTY

being

A thesis presented to the Graduate Faculty
of the Fort Hays Kansas State College in
partial fulfillment of the requirements for
the Degree of Master of Science

by

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Date May 30, 1938 Approved: Robert T. McPartch, Ph.D.
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gift

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John M. Strange

7-38

Chapter I

History of the Use of Clay in Pottery Making

The first discovery of the use of clay in making utensils and how that discovery was made have been lost in the dim and distant beginning of man's existence. The discovery probably was made entirely by accident, as many great inventions were.

A woman observed that a coating of clay from the river's edge, plastered inside her crude basket, kept the small grains and berries from sifting out. By accident, this basket could have been placed too near, or thrown upon the fire, and the outer container of reeds or willows burned away, leaving a container that was hard and resistant. It would even hold water and could be used for a cooking pot.¹

This method of discovery may be entirely incorrect, but fragments of pottery which were made in this very manner, have been discovered in caves where prehistoric races lived.

A comprehensive and elaborate history of man's development of this craft, and his embellishment of it with artistic motifs, have no place in a thesis of this type. The reader, however, should remember that working in clay is world-wide, and pre-dates any of man's written history.

The ware of the first potters was unglazed and unadorned, but

¹ Gardner, Helen, Understanding The Arts.

as man progressed, his craftsmanship and artistic ability increased, and he saw the possibilities of incorporating both glazes and adornment in one product.¹ Thus was the use of simple glazes and designs added to pottery.

Man, in his search for ever new combinations and effects, discovered that certain natural formations, when placed in certain proportions and subjected to extremely high temperatures, made a white, vitrified ware of great beauty. This discovery gave us our porcelain which must not be confused with pottery; pottery is a product of clays of natural formations, while porcelain is a product of mixtures of compounds discovered, proportioned and mixed by the potter.

In searching for a local clay to use in our pottery department at the Fort Hays Kansas State College, the numerous deposits and many varieties found over Ellis County were surprising.

From this search has evolved this thesis, the purpose of which is to test samples of clays of Ellis County and to discover their possibilities for pottery making.

The method used was to select approximately one hundred samples of clay, and by the use of an analysis chart, study each sample. These samples were collected from all parts of the county--from outcroppings along streams, from cuts through hills, and from any exposed deposits. Each sample was placed in a container, numbered, the characteristics of each deposit noted, and the localities marked on a large map of the county.

¹ Binns, Charles F., The Potter's Craft.

An attempt was made to select the most likely deposit from all localities, but the scarcity of outcroppings in certain sections of the county made this difficult.

Several states in the Middle-West have, within recent years, made an exhaustive search for clay deposits that may be of commercial value. Iowa made a geological survey as early as 1902, and several valuable deposits have been discovered recently.¹

At the present time the Geology Department at the University of Louisiana is making a search of that state for deposits of clay and other minerals that may be of value.

The State Chamber of Commerce of the State of Kansas in 1937 went on record as favoring such a search in this state.

¹ Cox, Paul E., The Use of Iowa Clays in Small-Scale Production of Ceramic Art.

Chapter II

Clays of Ellis County

Clays are the product of the weathering of feldspar. The soluble matter of the feldspar has been carried away, leaving the insoluble. If the clay remains at the original location, it is a primary clay, usually white, and with a low content of iron, so that it burns white; it is called kaolin, or china clay. If, in the course of years, the clay has been transported to another location (by water, wind or glacier), it is a secondary clay; it has then lost the coarse particles of undecomposed feldspar which remain in the primary clays, but it now contains hydrated iron oxide mud, limestone powder, and organic impurities in varying amounts. The purer deposits of the secondary clays are more plastic than china clay, and are used under the name of ball clays.

Clays differ in many particulars, especially in their plasticity, which in turn depends upon their content of admixed organic matter, upon their state of hydration, and upon the fineness of the subdivision of the particles.

A plastic clay is called a fat clay, a less plastic one a lean clay. Plasticity is the resultant of two separate properties; deformability, which allows shaping, and tenacity, which resists tearing.

Another property of clays which is of great importance is fusibility, which allows them to become dense upon firing. This density is of extreme importance, for without it, the ware is porous, soft, and easily broken, thus lessening its utility.

The third property we seek in clays to be used for the making of pottery, is porosity. This porosity depends upon the flint or silica content. Without porosity, the ware cannot lose its water of mixture by drying, and the ware becomes warped.

The two properties, plasticity, which allows the ware to hold together, and porosity, which allows it to dry properly, must be evenly balanced.

To determine these properties, and the amount of each, as well as other valuable characteristics of clays, the following list of tests has been chosen. Each individual test gives data that is of help in determining the value of the clay for use in pottery making.

Characteristics of deposit

While this is not necessarily a test of the value of the clay, it does show the size of the deposit, ease by which it may be obtained, and other information which may be of value.

Slaking qualities

This test shows whether or not the clay will break down readily or must be blunged or ground before it can be used.

Per cent of coarse material

This test shows whether or not there is too much coarse gravel or other undesirable material present.

Plasticity

This information is important. A clay low in plasticity is of little value.

Per cent of water of plasticity

There is a close correlation between the per cent of water required to make a clay plastic and its plasticity. The less plastic the clay, generally, the lower the per cent of water of plasticity. The per cent of water necessary to make the clay plastic is obtained by this method. One hundred grams of dry clay are crushed to a powder and water added until the clay becomes wet and plastic, then the amount of water is divided by the weight of the clay.

$$WP = \frac{W}{C}$$

Shrinkage

Low shrinkage in a clay is a sign of a fat clay, or one with a high content of sand. This type of clay is usually weak and brittle in the green-ware, and porous when fired. The higher the shrinkage, the more dense will be the ware; however, a high shrinkage is also a sign that other difficulties will be met such as warping, cracking, etc.

Color

Color for most wares of a commercial nature is of little importance, however, for art wares, decorative tiles, and some facing bricks, a clay that is light in color when fired is more desirable.

The color of the clay varies as the heat varies. For this reason two different temperatures have been used to show this vari-

ance. The first firing is to cone .04, which is 1922 F., according to the table of the Standard Pyrometric Chart. Cone .02 reaches the temperature of 2003 F.

Dry strength

Strength in a clay during the green-ware stage is necessary or the breakage will be high. There is a close correlation between shrinkage and dry strength. The higher the shrinkage, the stronger the clay.

Absorption

When a clay is porous there is a greater amount of open space between the clay particles. This allows water to seep through. The clay should show little, if any absorption, at the temperature by which the body is matured.

Warpage

A good clay must approach the vitrification point without a deformation of shape. If a clay tends to sag and warp it is of little use as a pottery body.

Action in mold

If a clay cannot be used in casting it has little use in pottery making.

Action when glazed

Some clays absorb the glaze when fired. This fault makes their use prohibitive.

Test 1 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 10 Township 13 Range 19 County Ellis

Characteristics of deposit Deposit of unknown thickness--top of deposit two feet below surface of top soil.

Slaking qualities Breaks down in about six minutes.

Per cent of coarse material not passing mesh No. 80 3%

Plasticity Fairly plastic.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry 6% Raw

Fired cone .04 1 Cone .04

Fired cone .02 1 $\frac{1}{2}$ Cone .02

Total shrinkage 8 $\frac{1}{2}$ %

Dry strength (pounds per square inch) 380 lbs.

Absorption. cone .04 9.88% cone .02 4%

Warpage. (in mm from horizontal) at cone .02 2 mm

Action in mold Casts well.

Action when glazed Takes glaze well.

Remarks and conclusions This clay is too sandy to be used successfully in its present mixture. The color is good and all tests show fairly good results.



Test 2 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 20 Township 12 Range 19 County Ellis

Characteristics of deposit A large deposit of unknown thickness two feet
below the surface.

Slaking qualities Breaks down in two minutes.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity Not very plastic--large percentage of fine sand.

Per cent of water of plasticity 26%

SHRINKAGE

COLOR

Slip to dry 5% Raw

Fired cone .04 $\frac{1}{2}$ % Cone .04

Fired cone .02 1% Cone .02

Total shrinkage 6 $\frac{1}{2}$ %

Dry strength (pounds per square inch) 260 lbs.

Absorption. cone .04 47.02% cone .02 25.61%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold Cracks in mold--hard to remove whole.

Action when glazed The ware steals the silica from the glaze.

Remarks and conclusions This clay has a good color when fired, but the
ware is chalky and has very little strength. The fault of the body
stealing the silica from the glaze and leaving the surface of the
ware rough and gritty makes it undesirable for pottery making. A
mixture of this and a more plastic clay might give a workable clay.

*

No test could be made.



Test 3 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 13 Township 11 Range 20 County Ellis

Characteristics of deposit Large shale deposit.

Slaking qualities Breaks down in about fifteen minutes.

Per cent of coarse material not passing mesh No. 80 2 %

Plasticity Quite plastic.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry 7 % Raw

Fired cone .04 1 % Cone .04

*

Fired cone .02 % Cone .02

*

Total shrinkage %



Dry strength (pounds per square inch) 495 lbs.

Absorption. cone .04 11.8 % cone .02 5 %

*

Warpage. (in mm from horizontal) at cone .02 mm

Action in mold Breaks in mold.

Action when glazed Takes glaze well.

Remarks and conclusions The clay has a musty odor, is quite plastic,

but does not turn loose of molds. It is very dense at cone .02,

but the fault of cracking in the mold upon drying makes it undesir-

able for pottery making.

*

No test could be made.

Test 4 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 11 Township 11 Range 20 County Ellis

Characteristics of deposit Large hill of clay.

Slaking qualities Breaks down in two minutes.

Per cent of coarse material not passing mesh No. 80 4.5 %

Plasticity Practically none.

Per cent of water of plasticity 34 %

SHRINKAGE

COLOR

Slip to dry 7 % Raw

Fired cone .04 $\frac{1}{2}$ % Cone .04

Fired cone .02 $\frac{1}{2}$ % Cone .02

Total shrinkage 8 %

Dry strength (pounds per square inch) 410 lbs.

Absorption. cone .04 18.95 % cone .02 13.41 %

Warpage. (in mm from horizontal) at cone .02 1 mm

Action in mold Cracks--cannot be removed from mold.

Action when glazed The glaze is filled with small bubbles.

Remarks and conclusions The deposit appears to be largely sand and is of no value in its present mixture.



Test 5 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 21 Township 11 Range 20 County Ellis

Characteristics of deposit Sample taken from ditch at side of road under
about three feet of top soil.

Slaking qualities Breaks down in two minutes.

Per cent of coarse material not passing mesh No. 80 sand & shell 10%

Plasticity Very little.

Per cent of water of plasticity 32%

SHRINKAGE

COLOR



Slip to dry * %Raw

Fired cone .04 * %Cone .04

Fired cone .02 * %Cone .02

Total shrinkage * %

Dry strength (pounds per square inch) 670lbs.

Absorption. cone .04 17.58% cone .02 no%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold Cracks in mold--cannot be taken out whole.

Action when glazed *

Remarks and conclusions This clay has a high content of silica and
does not cast. It breaks easily in the green-ware state. At cone
.02 the test became vitrified and stuck to the shelf.

* No test could be made.

Test 6 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 3 Township 12 Range 20 County Ellis

Characteristics of deposit This sample is hard shale taken from the lower section of a twenty foot cliff on the south bank of a small stream.

Slaking qualities --will not break down--must be pulverized.

Per cent of coarse material not passing mesh No. 80 1 %

Plasticity --very little.

Per cent of water of plasticity 42 %

SHRINKAGE

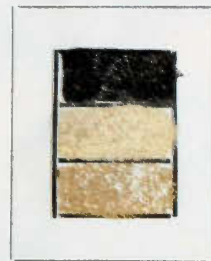
COLOR

Slip to dry 1 % Raw

Fired cone .04 0 % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 480 lbs.

Absorption. cone .04 69.44 % cone .02 70 %

Warping. (in mm from horizontal) at cone .02 * mm

Action in mold --casts fairly well.

Action when glazed This test absorbs the glaze.

Remarks and conclusions This coarse gray shale will not break down when soaked. It must be crushed to be used. Firing does not make this test dense. It is chalky and easily crushed even after being fired to cone .02. This clay is of no value as a pottery body.

* No test could be made.

Test 7. Locality NW 1/4 of SW 1/4 Section 20 Township 13 Range 20 County Ellis

Characteristics of deposit --large deposit of shale.

Slaking qualities --partially slakes in few minutes.

Per cent of coarse material not passing mesh No. 80 0%

Plasticity --very plastic.

Per cent of water of plasticity 34%

SHRINKAGE	COLOR
Slip to dry <u>8%</u> Raw	
Fired cone .04 <u>1%</u> Cone .04	
Fired cone .02 <u>2%</u> Cone .02	
Total shrinkage <u>11 1/2%</u>	



Dry strength (pounds per square inch) 570 lbs.

Absorption. cone .04 10.12% cone .02 4.31%

Warpage. (in mm from horizontal) at cone .02 0 mm

Action in mold --sticks to mold.

Action when glazed The glaze is smooth without bubbles.

Remarks and conclusions This shale breaks down readily, but leaves quite a quantity (about 25%) of flakes of darker shale that must be churned or ground into solution. This clay does not readily shrink away from the mold, which is a fault that could be corrected by an addition of flint or a more sandy clay. The color is a little too dark to use as a pottery clay when transparent glazes are to be used.

Test 8 Locality NW 1/4 of SW 1/4 Section 4 Township 15 Range 20 County Ellis

Characteristics of deposit --large deposit on the west side of road north of Smoky River.

Slaking qualities --breaks down in eight minutes.

Per cent of coarse material not passing mesh No. 80 20.8% Gypsum and fossil shells

Plasticity --practically none.

Per cent of water of plasticity 32%

SHRINKAGE

COLOR

Slip to dry	*	%Raw	-----
Fired cone .04	*	%Cone .04	-----
Fired cone .02	*	%Cone .02	-----
Total shrinkage	*	%	-----



Dry strength (pounds per square inch) 340 lbs.

Absorption. cone .04 24.44% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --water absorbed immediately--will not cast.

Action when glazed *

Remarks and conclusions This clay appears to be mostly fine sand--will not hold in suspension. It vitrifies and sticks to shelf at cone .02.

* No test could be made.

Test 9 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 9 Township 15 Range 20 County Ellis

Characteristics of deposit --large deposit on hillside on south banks of Smoky River--under about twelve inches of top soil.

Slaking qualities --breaks down in about four minutes.

Per cent of coarse material not passing mesh No. 80 $\frac{1}{2}$ %

Plasticity --quite plastic.

Per cent of water of plasticity 52 %

SHRINKAGE

COLOR

Slip to dry 13 % Raw

Fired cone .04 7 % Cone .04

Fired cone .02 0 % Cone .02

Total shrinkage 20 %

Dry strength (pounds per square inch) 680 lbs.

Absorption. cone .04 35 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 0 mm

Action in mold --casts well.

Action when glazed --glazes well.

Remarks and conclusions This clay has an exceptionally large shrinkage. The ware is quite strong in the green-ware state. The clay became very dense at cone .02. The dark color and exceptionally large shrinkage make it undesirable for pottery.



Test 10 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 30 Township 15 Range 19 County Ellis

Characteristics of deposit --large deposit of shale.

Slaking qualities --breaks down in about five minutes.

Per cent of coarse material not passing mesh No. 80 0%

Plasticity --very plastic.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry 9 $\frac{1}{2}$ % Raw

Fired cone .04 1 $\frac{1}{2}$ % Cone .04

Fired cone .02 1% Cone .02

Total shrinkage 12%

Dry strength (pounds per square inch) 300 lbs.

Absorption. cone .04 13.7% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts fairly well.

Action when glazed *

Remarks and conclusions This test vitrified and stuck to the clay shelf
at cone .02. It is strong in the green-ware, but its color makes
it of little value as pottery clay.



* No test could be made.

Test 11 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 11 Township 15 Range 18 County Ellis

Characteristics of deposit --large deposit on hill one fourth mile north of Smoky River.

Slaking qualities --breaks down in about two minutes.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --highly plastic.

Per cent of water of plasticity 46%

SHRINKAGE

COLOR

Slip to dry 11% Raw

Fired cone .04 6% Cone .04

Fired cone .02 * Cone .02

Total shrinkage *%



Dry strength (pounds per square inch) 990 lbs.

Absorption. cone .04 2.95% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The ware warps badly when fired, but is strong in the green-ware. The dark color and the breakage in the mold makes this test useless.

*

No test could be made.

Test 12 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 23 Township 15 Range 18 County Ellis

Characteristics of deposit --large deposit exposed by grader.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 1 $\frac{1}{2}$ %

Plasticity --very little plasticity.

Per cent of water of plasticity 50%

SHRINKAGE

COLOR

Slip to dry 2% Raw

Fired cone .04 * Cone .04

Fired cone .02 * Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 480 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This clay air-slaked after firing at cone .04.

It breaks easily in the green-ware state and is valueless for pot-
tery.

* No test could be made.

Test 13 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 10 Township 15 Range 17 County Ellis

Characteristics of deposit --small deposit taken from ditch at side of road.

Slaking qualities --slakes almost immediately.

Per cent of coarse material not passing mesh No. 80 2 %

Plasticity --not very plastic.

Per cent of water of plasticity 44 %

SHRINKAGE

COLOR

Slip to dry 3 % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %

Dry strength (pounds per square inch) 465 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions After the first firing at cone .04 this clay

air-slaked upon cooling. It cracked in the mold and the green-ware was easily broken. It is valueless for pottery.

* No test could be made.



Test 14 Locality NE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 14 Township 15 Range 17 County Ellis

Characteristics of deposit --small deposit found at the side of the road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 3%

Plasticity --slightly plastic.

Per cent of water of plasticity 56%

SHRINKAGE

COLOR

Slip to dry * %Raw
* %Cone .04
 Fired cone .04 * %Cone .04
* %Cone .02
 Fired cone .02 * %Cone .02
 Total shrinkage %



Dry strength (pounds per square inch) 540 lbs.

Absorption. cone .04 56.62% cone .02 48%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The green-ware is easily broken. The test is porous and crumbles easily. It is valueless for pottery in its pure state.

* No test could be made.

Test 15 Locality NE 1/4 of NE 1/4 Section 26 Township 15 Range 17 County Ellis

Characteristics of deposit --large deposit exposed by cut through hill.

Slaking qualities --slakes slowly.

Per cent of coarse material not passing mesh No. 80 26%

Plasticity --very little plasticity.

Per cent of water of plasticity 46%

SHRINKAGE

COLOR

Slip to dry 5 % Raw *
 Fired cone .04 * % Cone .04 *
 Fired cone .02 * % Cone .02 *
 Total shrinkage * %



Dry strength (pounds per square inch) 450 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks when drying.

Action when glazed *

Remarks and conclusions This clay has very little plasticity. The coarse material lawned out consists of fossil shell. The sample air-slaked after firing at cone .04, and is valueless for pottery.

* No test could be made.

Test 16 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 25 Township 15 Range 17 County Ellis

Characteristics of deposit --large deposit on top of hill north of bridge.

Slaking qualities --does not slake--must be ground.

Per cent of coarse material not passing mesh No. 80.....1 %

Plasticity --slightly plastic.

Per cent of water of plasticity.....50 %

SHRINKAGE

COLOR

Slip to dry.....* %Raw

Fired cone .04.....* %Cone .04.....

Fired cone .02.....* %Cone .02.....

Total shrinkage.....* %



Dry strength (pounds per square inch).....630 lbs.

Absorption. cone .04.....19.7 % cone .02.....0 %

Warpage. (in mm from horizontal) at cone .02.....* mm

Action in mold --cracks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The green-ware is easily broken. Test pieces, when cast, break in the mold. This clay becomes very dense at cone .02, however, it warps too much to be of value.

* No test could be made.

Test 17 Locality NE 1/4 of NW 1/4 Section 22 Township 15 Range 16 County Ellis

Characteristics of deposit --small deposit in ditch at the side of the road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 2 %

Plasticity --very little.

Per cent of water of plasticity 48 %

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----

Dry strength (pounds per square inch) 375 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed *

Remarks and conclusions The test crumbled upon cooling after being

fired to cone .04. It breaks in the test mold when casting and

cannot be removed whole. It is useless as pottery clay.



* No test could be made.

Test 18 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 13 Township 15 Range 16 County Ellis

Characteristics of deposit --large deposit exposed by road cut through hill.

Slaking qualities --does not slake--must be ground.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --very little.

Per cent of water of plasticity 50%

SHRINKAGE

COLOR

Slip to dry	*	% Raw	-----
Fired cone .04	*	% Cone .04	-----
Fired cone .02	*	% Cone .02	-----
Total shrinkage	*	%	-----



Dry strength (pounds per square inch) 555 lbs.

Absorption. cone .04 70.37% cone .02 34.61%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions When fired the ware is soft and chalky and it breaks in the test mold. It is valueless as a pottery clay.

* No test could be made.

Test 19 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 1 Township 15 Range 16 County Ellis

Characteristics of deposit --small deposit exposed by grader.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 sand 5%

Plasticity --very little.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry 3% Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 270 lbs. -----

Absorption. cone .04 * % cone .02 * % -----

Warpage. (in mm from horizontal) at cone .02 * mm -----

Action in mold --cracks in mold.

Action when glazed * -----

Remarks and conclusions This clay slakes after being fired at cone .04.

It breaks in the test mold and is valueless as a pottery clay.

* No test could be made.

Test 20 Locality NE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 34 Township 14 Range 16 County Ellis

Characteristics of deposit --vein one foot thick exposed by grader.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80.....3%

Plasticity --slightly plastic.

Per cent of water of plasticity.....50%

SHRINKAGE

COLOR

Slip to dry.....6% Raw

Fired cone .04.....*% Cone .04.....

Fired cone .02.....*% Cone .02.....

Total shrinkage



Dry strength (pounds per square inch).....705 lbs.

Absorption. cone .04.....30.85% cone .02.....19.78%

Warpage. (in mm from horizontal) at cone .02.....* mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This is a light gray shale-like formation rather coarse in texture. The test piece cracked in the mold and could not be removed whole. It is chalky and soft, and of no value in pottery.

*

No test could be made.

Test 21 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 14 Township 14 Range 16 County Ellis

Characteristics of deposit --three foot vein exposed by grader in cut
through small hill.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80..... 5 %

Plasticity --very plastic.

Per cent of water of plasticity..... 44 %

SHRINKAGE

COLOR

Slip to dry..... 12 $\frac{1}{2}$ % Raw

Fired cone .04..... * % Cone .04

Fired cone .02..... * % Cone .02

Total shrinkage * %

Dry strength (pounds per square inch)..... 1240 lbs.

Absorption. cone .04..... 10.9 %..... cone .02..... 0 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in test mold.

Action when glazed..... *

Remarks and conclusions The test piece broke in the mold. The clay

vitriified at cone .02. The color makes this clay of little value
for pottery.



* No test could be made.

Test 23 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 10 Township 13 Range 16 County Ellis

Characteristics of deposit --small deposit exposed by grader.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 3 $\frac{1}{2}$ %

Plasticity --slightly plastic.

Per cent of water of plasticity 46%

SHRINKAGE

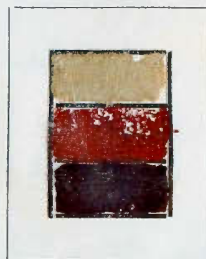
COLOR

Slip to dry 12% Raw -----

Fired cone .04 * Cone .04 -----

Fired cone .02 * Cone .02 -----

Total shrinkage * -----



Dry strength (pounds per square inch) 690 lbs.

Absorption. cone .04 2.46% cone .02 1.31%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed Takes glaze well.

Remarks and conclusions The ware is very dense at cone .02, however,

the breakage in the test mold makes it valueless as a pottery clay.

* No test could be made.

Test 24 Locality NE $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 2 Township 13 Range 16 County Ellis

Characteristics of deposit --large deposit on west side of small stream.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 2 %

Plasticity --quite plastic.

Per cent of water of plasticity 48 %

SHRINKAGE

COLOR

Slip to dry 13 % Raw

Fired cone .04 6 % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 780 lbs.

Absorption. cone .04 1.85 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed Takes glaze well.

Remarks and conclusions This sample of light blue shale becomes a dark red in color after firing which makes it of little value for pottery making. It becomes very dense at cone .04 and breaks in the test mold.

* No test could be made.

Test 25 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 25 Township 12 Range 16 County Ellis

Characteristics of deposit --found in vein under about two feet of top soil in a ditch at the side of the road.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 5 $\frac{1}{2}$ %

Plasticity --quite plastic.

Per cent of water of plasticity 42%

SHRINKAGE

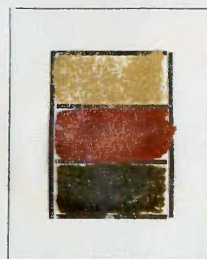
COLOR

Slip to dry 9% Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 1050 lbs.

Absorption. cone .04 10.2% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The test broke in the mold. The ware vitrified at cone .02. The fault of breaking in the mold makes this clay valueless.

* No test could be made.

Test 26 Locality SW¹/₄ of NW¹/₄ Section 14 Township 12 Range 16 County Ellis

Characteristics of deposit --small deposit exposed by cut through small hill.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 7¹/₂%

Plasticity --quite plastic.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry 10% Raw

Fired cone .04 1% Cone .04

Fired cone .02 1% Cone .02

Total shrinkage 12%

Dry strength (pounds per square inch) 870 lbs.

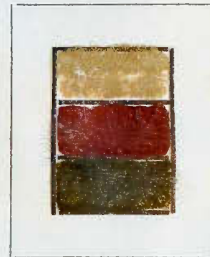
Absorption. cone .04 23.18% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 3 mm

Action in mold --cracks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This test vitrifies at cone .02 and is strong in the green-ware, but its dark color makes it of little value as a clay for making pottery.



Test 27 Locality SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 34 Township 11 Range 16 County Ellis

Characteristics of deposit --vein under one foot of top soil.

Slaking qualities --slakes slowly.

Per cent of coarse material not passing mesh No. 80 5%

Plasticity --quite plastic.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry 8% Raw

Fired cone .04 2% Cone .04

Fired cone .02 2% Cone .02

Total shrinkage 12%

Dry strength (pounds per square inch) 660 lbs.

Absorption. cone .04 16.57% cone .02 10.81%

Warpage. (in mm from horizontal) at cone .02 1 mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The surface of this clay is rough and coarse

and is flaked with small white specks. It is strong in green-ware, but its light brown color is undesirable.



Test 28 Locality NE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 25 Township 11 Range 16 County Ellis

Characteristics of deposit --large deposit on top of hill.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 8 %

Plasticity --quite plastic.

Per cent of water of plasticity 44 %

SHRINKAGE

COLOR

Slip to dry 12 % Raw

Fired cone .04 3 % Cone .04

*

Fired cone .02 * % Cone .02

*

Total shrinkage * %



Dry strength (pounds per square inch) 945 lbs.

Absorption. cone .04 6.58 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay vitrifies at cone .02, breaks in the test mold, and is too dark for a good pottery clay.

* No test could be made.

Test 29 Locality NW 1/4 of NE 1/4 Section 15 Township 11 Range 16 County Ellis

Characteristics of deposit --large deposit on north side of road in drainage ditch.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 8 1/2%

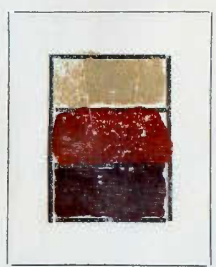
Plasticity --very plastic.

Per cent of water of plasticity 42%

SHRINKAGE

COLOR

Slip to dry	<u>14%</u>	Raw	-----
Fired cone .04	<u>*</u>	% Cone .04	-----
Fired cone .02	<u>*</u>	% Cone .02	-----
Total shrinkage	<u>*</u>	%	-----



Dry strength (pounds per square inch) 870 lbs.

Absorption. cone .04 3.73 % cone .02 0 %

Warp. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This sample is very brittle in the green-ware state and breaks too easily. It vitrifies at cone .02, and is too dark to use as pottery clay.

* No test could be made.

Test 30 Locality SE $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 12 Township 11 Range 17 County Ellis

Characteristics of deposit --large deposit on top of hill exposed by
grader.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 17%

Plasticity --medium plasticity.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry 8% Raw

Fired cone .04 1% Cone .04

Fired cone .02 *% Cone .02

Total shrinkage *%



Dry strength (pounds per square inch) 630 lbs.

Absorption. cone .04 13.42% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 *mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay vitrifies at cone .02. The green-
ware is strong, but brittle. It is too dark to be used.

* No test could be made.

Test 31 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 5 Township 12 Range 17 County Ellis

Characteristics of deposit --large deposit--vein about three feet thick
under two feet of top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 5%

Plasticity --very little plasticity.

Per cent of water of plasticity 48%

SHRINKAGE

COLOR

Slip to dry 7% Raw Raw

Fired cone .04 5% Cone .04 Cone .04

Fired cone .02 *% Cone .02 *

Total shrinkage *%

Dry strength (pounds per square inch) 340 lbs.

Absorption. cone .04 *% cone .02 *%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold cracks in mold.

Action when glazed *

Remarks and conclusions The sample air-slaked after firing at cone .04.

It crumbled easily, and was not good for pottery clay.



* No test could be made.

Test 32 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 2 Township 12 Range 18 County Ellis

Characteristics of deposit --large deposit exposed by grader.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 8%

Plasticity --not very plastic.

Per cent of water of plasticity 46%

SHRINKAGE

COLOR

Slip to dry 6% Raw

Fired cone .04 2% Cone .04

Fired cone .02 2% Cone .02

Total shrinkage 10%

Dry strength (pounds per square inch) 370 lbs.

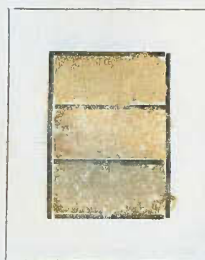
Absorption. cone .04 49.77% cone .02 36.84%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts fairly well.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay is too soft for pottery. It crumb-
les easily in the green-ware, and the fired ware is soft and chalky.



* No test could be made.

Test 33 Locality SW $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 13 Township 11 Range 18 County Ellis

Characteristics of deposit --large deposit close to stream.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80.....19%

Plasticity --very plastic.

Per cent of water of plasticity.....50%

SHRINKAGE

COLOR

Slip to dry.....11% Raw

Fired cone .04.....8% Cone .04.....

Fired cone .02.....1% Cone .02.....

Total shrinkage.....20%

Dry strength (pounds per square inch).....675 lbs.

Absorption. cone .04.....1.61% cone .02.....0%

Warpage. (in mm from horizontal) at cone .02.....1 mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions The high shrinkage and dark color of this clay make it undesirable for use as a pottery clay, however, the greenware is very hard and durable.



Test 34 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 8 Township 11 Range 18 County Ellis

Characteristics of deposit --large deposit exposed by grader.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 9 %

Plasticity --very plastic.

Per cent of water of plasticity 50 %

SHRINKAGE

COLOR

Slip to dry 12 % Raw

Fired cone .04 8 % Cone .04

Fired cone .02 0 % Cone .02

Total shrinkage 20 %

Dry strength (pounds per square inch) 600 lbs.

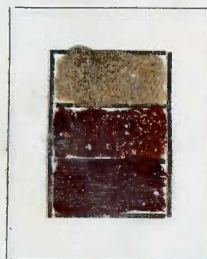
Absorption. cone .04 .32 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 0 mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions This ware is hard and durable but the dark color and high shrinkage lessen its value for pottery making. It vitrifies at cone .04--very hard green-ware.



Test 35 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 22 Township 11 Range 19 County Ellis

Characteristics of deposit --large deposit of sandy clay exposed by grader.

Slaking qualities --breaks down immediately.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --not very plastic.

Per cent of water of plasticity 34%

SHRINKAGE

COLOR

Slip to dry *% Raw _____
 Fired cone .04 *% Cone .04 _____
 Fired cone .02 *% Cone .02 _____
 Total shrinkage *% _____



Dry strength (pounds per square inch) 600 lbs.

Absorption. cone .04 20.22% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The sample vitrified at cone .04, crumbles easily, and is not plastic enough to be of any value as a pottery body. Its color is a dull dark green.

* No test could be made.

Test 36 Locality NE 1/4 of NW 1/4 Section 11 Township 12 Range 19 County Ellis

Characteristics of deposit --small deposit on top of hill by winding road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 60%

Plasticity --medium plasticity.

Per cent of water of plasticity 48%

SHRINKAGE

COLOR

Slip to dry	<u>4</u> %	Raw	-----
Fired cone .04	<u>0</u> %	Cone .04	-----
Fired cone .02	<u>*</u> %	Cone .02	-----
Total shrinkage	<u>*</u> %		-----



Dry strength (pounds per square inch) 495 lbs.

Absorption. cone .04 50 % cone .02 51.75 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The ware is soft and porous--not strong and dense enough for pottery making. It crumbles easily and is not plastic enough for use.

* No test could be made.

Test 37 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 25 Township 12 Range 19 County Ellis

Characteristics of deposit --small vein under two feet of top soil from ditch at side of road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 42%

Plasticity --very little.

Per cent of water of plasticity 34%

SHRINKAGE

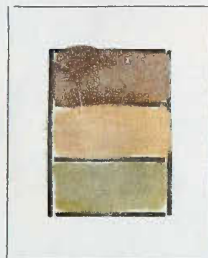
COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 480 lbs.

Absorption. cone .04 38.85 % cone .02 26.04 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed The clay absorba the glaze.

Remarks and conclusions The ware crumbles easily after being fired and is not good for pottery making. It has a high content of sand and not enough plasticity to make it usable.

* No test could be made.

Test- 38 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 7 Township 13 Range 18 County Ellis

Characteristics of deposit --small deposit under top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 17%

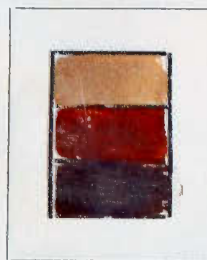
Plasticity --practically none.

Per cent of water of plasticity 36%

SHRINKAGE

COLOR

Slip to dry	<u>4</u> %	Raw	
Fired cone .04	<u>*</u>	% Cone .04	
Fired cone .02	<u>*</u>	% Cone .02	
Total shrinkage	<u>*</u>	%	



Dry strength (pounds per square inch) 945 lbs.

Absorption. cone .04 23.68% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 *mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay has a high content of sand which makes its removal from the mold difficult. The ware is too dark to be of any value in pottery making.

* No test could be made.

Test 39 Locality SE $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 19 Township 13 Range 17 County Ellis

Characteristics of deposit --small deposit at the side of the road in drainage ditch.

Slaking qualities --breaks down immediately.

Per cent of coarse material not passing mesh No. 80 5 %

Plasticity --very little.

Per cent of water of plasticity 34 %

SHRINKAGE

COLOR

Slip to dry	*	% Raw	
Fired cone .04	*	% Cone	.04
Fired cone .02	*	% Cone	.02
Total shrinkage	*	%	



Dry strength (pounds per square inch) 720 lbs.

Absorption. cone .04 22.5 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 *mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This ware vitrifies at .02. It is very sandy and not plastic enough to be of any value.

* No test could be made.

Test 40 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 20 Township 13 Range 17 County Ellis

Characteristics of deposit --small deposit under three feet of top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80..... 8 %

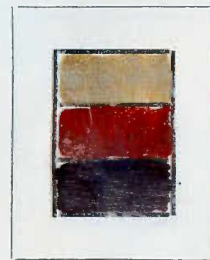
Plasticity --very little.

Per cent of water of plasticity..... 42 %

SHRINKAGE

COLOR

Slip to dry.....*	% Raw
Fired cone .04.....*	% Cone .04.....
Fired cone .02.....*	% Cone .02.....
Total shrinkage.....*	%



Dry strength (pounds per square inch)..... 1050 lbs.

Absorption. cone .04..... 16.36 %..... cone .02..... 0 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The ware breaks into small pieces--has a high content of sand, and because of its dark color and lack of plasticity, is of no use in pottery making.

* No test could be made.

Test 41 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 17 Township 13 Range 17 County Ellis

Characteristics of deposit --large deposit from cut west of small stream.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --very plastic.

Per cent of water of plasticity 48%

SHRINKAGE

COLOR

Slip to dry 10% Raw -----

Fired cone .04 4% Cone .04 -----

Fired cone .02 3% Cone .02 -----

Total shrinkage 17%

Dry strength (pounds per square inch) 690 lbs.

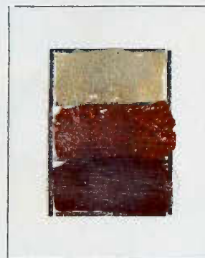
Absorption. cone .04 1.61% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions The green ware is of medium strength but the test piece broke in the first firing. This clay vitrifies at cone .02, but it is too dark in color to be of much value.



* No test could be made.

Test 42 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 9 Township 13 Range 17 County Ellis

Characteristics of deposit --large deposit from bank west of stream.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 3%

Plasticity --very, very plastic.

Per cent of water of plasticity 50%

SHRINKAGE

COLOR

Slip to dry 14% Raw

Fired cone .04 8% Cone .04

Fired cone .02 0% Cone .02

Total shrinkage 22%

Dry strength (pounds per square inch) 810 lbs.

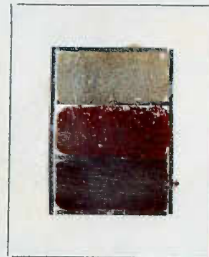
Absorption. cone .04 0% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 1 mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions The shrinkage in this sample is exceptionally large, and the green-ware is strong. It vitrifies at cone .04, and is very hard but the color lessens its value.



Test 43 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 27 Township 13 Range 17 County Ellis

Characteristics of deposit --large deposit from ditch east of small stream.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --very little.

Per cent of water of plasticity 34%

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 660 lbs.

Absorption. cone .04 17.82% cone .02 4%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The green-ware crumbles easily on account of
the large content of sand. At cone .02 the ware is quite dense,
however, the color is too dark to be good.

* No test could be made.

Test 44 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 30 Township 13 Range 16 County Ellis

Characteristics of deposit --chalky white deposit from eight-foot cut at right side of road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 7 %

Plasticity --practically none.

Per cent of water of plasticity 30 %

SHRINKAGE

COLOR

Slip to dry	<u>1</u> %	Raw	-----
	*		
Fired cone .04	-----	% Cone	<u>.04</u> -----
	*		
Fired cone .02	-----	% Cone	<u>.02</u> -----
	*		
Total shrinkage	-----	%	



Dry strength (pounds per square inch) 170 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed *

Remarks and conclusions This sample crumbles easily in the green-ware state. Upon firing the test piece air-slaked. It is of no use as a pottery clay.

* No test could be made.

Test 45 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 12 Township 13 Range 17 County Ellis

Characteristics of deposit --shallow deposit under ten inches of top soil
from ditch on west side of road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80.....4%

Plasticity --very little.

Per cent of water of plasticity.....36%

SHRINKAGE

COLOR

Slip to dry.....6% Raw

Fired cone .04.....*% Cone .04.....

Fired cone .02.....*% Cone .02.....

Total shrinkage.....*%



Dry strength (pounds per square inch).....990 lbs.

Absorption. cone .04.....23.33%.....cone .02.....19.66%

Warpage. (in mm from horizontal) at cone .02.....* mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions There is a high content of sand in this sample.

It has medium strength in the green-ware, but breaks upon being
fired. It is of little value as a pottery clay in its pure form,
however, it might be used with a more plastic clay to make it a bet-
ter one.

* No test could be made.

Test 46 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 19 Township 12 Range 16 County Ellis

Characteristics of deposit --found in ditch on east side of the road.

Slaking qualities --breaks down immediately.

Per cent of coarse material not passing mesh No. 80 1 $\frac{1}{2}$ %

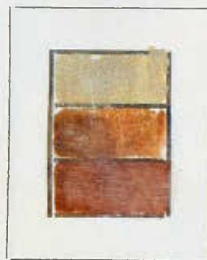
Plasticity --practically none.

Per cent of water of plasticity 36%

SHRINKAGE

COLOR

Slip to dry	*	%Raw
Fired cone .04	*	%Cone .04
Fired cone .02	*	%Cone .02
Total shrinkage	*	%



Dry strength (pounds per square inch) 660 lbs.

Absorption. cone .04 22.44 % cone .02 22.58 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks and sticks to mold.

Action when glazed The glaze is filled with small bubbles.

Remarks and conclusions This test is practically all sand and crumbles easily. The deposit was full of small white stones. When fired the test was sandy and rough. It is of no good for pottery making.

* No test could be made.

Test 47 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 14 Township 12 Range 17 County Ellis

Characteristics of deposit --large deposit full of small white stones
found in ditch on north side of road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 34 %

Plasticity --practically none.

Per cent of water of plasticity 38 %

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 170 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This sample crumbles easily in the green-ware
and air-slakes after being fired to cone .04. It is of no value
for pottery making.

* No test could be made.

Test 48 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 4 Township 12 Range 17 County Ellis

Characteristics of deposit --large deposit under twelve inches of top soil on west side of the road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 42 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity 30%

SHRINKAGE

COLOR

Slip to dry 5% Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----

Dry strength (pounds per square inch) 225 lbs.

Absorption. cone .04 * % cone .02 * %

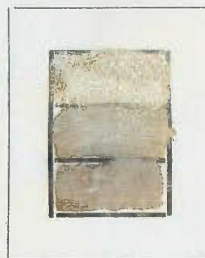
Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions The clay air-slakes after being fired at cone

.04. It has a chalky texture, is soft and crumbly, and is of no value as a pottery clay.



* No test could be made.

Test 49 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 16 Township 12 Range 17 County Ellis

Characteristics of deposit --large deposit from ditch on the north side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 6%

Plasticity --very little.

Per cent of water of plasticity 40%

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 600 lbs.

Absorption. cone .04 20% cone .02 12.09%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This sample breaks upon firing and is too sandy and too dark for good clay.

* No test could be made.

Test 50 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 17 Township 12 Range 17 County Ellis

Characteristics of deposit --large deposit covered with two feet of top soil from ditch on the north side of the road.

Slaking qualities --breaks down readily.

Per cent of coarse material not passing mesh No. 80..... 38 %

Plasticity --not very plastic.

Per cent of water of plasticity..... 46 %

SHRINKAGE

COLOR

Slip to dry..... * % Raw

Fired cone .04..... * % Cone .04.....

Fired cone .02..... * % Cone .02.....

Total shrinkage..... * %

Dry strength (pounds per square inch)..... 660 lbs.

Absorption. cone .04..... 34.11 %..... cone .02..... 32.1 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay crumbles too easily when fired--it also crumbles in the green-ware. It is too sandy--not dense enough for a good clay.



* No test could be made.

Test 51 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 14 Township 12 Range 18 County Ellis

Characteristics of deposit --thick vein from ditch one fourth mile south of farm house.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 14%

Plasticity --very little.

Per cent of water of plasticity 36%

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 885 lbs.

Absorption. cone .04 25.92% cone .02 15.53%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This sample crumbles easily and is too rough and sandy when fired. It is not plastic enough to use.

* No test could be made.

Test 52 Locality SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 15 Township 12 Range 18 County Ellis

Characteristics of deposit --thin layer of sandy white clay two feet under top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 50%

Plasticity --very little.

Per cent of water of plasticity 28%

SHRINKAGE

COLOR

Slip to dry 3% Raw -----

Fired cone .04 *% Cone .04 -----

Fired cone .02 *% Cone .02 -----

Total shrinkage *%

Dry strength (pounds per square inch) 360 lbs.

Absorption. cone .04 38.75% cone .02 35.05%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts without breaking.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This test crumbles easily in the green-ware and when fired at cone .02. It does not have enough plasticity to be usable.



* No test could be made.

Test 53 Locality SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 10 Township 12 Range 18 County Ellis

Characteristics of deposit --white deposit three feet thick in ditch on the east side of the road--top soil two feet thick.

Slaking qualities --slakes immediately.

Per cent of coarse material not passing mesh No. 80 38 %

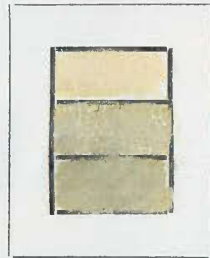
Plasticity --practically none.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry * % Raw -----
 Fired cone .04 * % Cone .04 -----
 Fired cone .02 * % Cone .02 -----
 Total shrinkage * % -----



Dry strength (pounds per square inch) 150 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This test air-slaked after being fired to cone .04. It crumbled easily in the green-ware state and is of no value as pottery clay.

* No test could be made.

Test 54 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 21 Township 11 Range 18 County Ellis

Characteristics of deposit --large deposit of shale on the east side of
the cut half way down the side of Dean's Hill.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80..... 20 %

Plasticity --quite plastic.

Per cent of water of plasticity..... 40 %

SHRINKAGE

COLOR

Slip to dry..... 9 % Raw

Fired cone .04..... 3 % Cone .04.....

Fired cone .02..... 3 % Cone .02.....

Total shrinkage..... 15 %

Dry strength (pounds per square inch)..... 765 lbs.

Absorption. cone .04..... 9.88 % cone .02..... 6.51 %

Warpage. (in mm from horizontal) at cone .02..... 1 mm

Action in mold --casts well.

Action when glazed --takes the glaze well.

Remarks and conclusions The green-ware is quite strong and it is dense
and strong when fired, but its color, which is a dark gray (shale)
makes it unsuitable for pottery clay.



Test 55 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 23 Township 11 Range 20 County Ellis

Characteristics of deposit --large deposit from west side of road one
half mile south of river.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 5%

Plasticity --very little.

Per cent of water of plasticity 38%

SHRINKAGE

COLOR

Slip to dry *% Raw

Fired cone .04 *% Cone .04

Fired cone .02 *% Cone .02

Total shrinkage *%



Dry strength (pounds per square inch) 705 lbs.

Absorption. cone .04 26.66% cone .02 11.43%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --glazes well.

Remarks and conclusions This sample breaks in the mold and does not
have enough plasticity to be usable as pottery clay.

* No test could be made.

Test 56 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 35 Township 11 Range 20 County Ellis

Characteristics of deposit --six inch vein of light gray shale from a deep ditch on the west side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 18 %

Plasticity --medium plasticity.

Per cent of water of plasticity 42 %

SHRINKAGE

COLOR

Slip to dry 1 % Raw

Fired cone .04 4 % Cone .04

Fired cone .02 0 % Cone .02

Total shrinkage 5 %

Dry strength (pounds per square inch) 570 lbs.

Absorption. cone .04 48.75 % cone .02 44 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts well.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The green-ware has medium strength but is quite gritty. When fired it is soft and light and cannot be used as a pottery clay.



* No test could be made.

Test 57 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 2 Township 12 Range 20 County Ellis

Characteristics of deposit --large deposit from ditch on the west side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 3 %

Plasticity --very little.

Per cent of water of plasticity 38 %

SHRINKAGE

COLOR

Slip to dry	*	% Raw
Fired cone .04	*	% Cone .04
Fired cone .02	*	% Cone .02
Total shrinkage	*	%



Dry strength (pounds per square inch) 570 lbs.

Absorption. cone .04 19.67 % cone .02 7.62 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This sample has a large per cent of sand and crumbles easily. The ware becomes quite dense upon firing but the color is too dark for pottery use.

* No test could be made.

Test 58 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 14 Township 12 Range 20 County Ellis

Characteristics of deposit --large deposit under a layer of sandstone on a hill on the west side of the road.

Slaking qualities --slakes immediately.

Per cent of coarse material not passing mesh No. 80 9 %

Plasticity --practically none.

Per cent of water of plasticity 44 %

SHRINKAGE

COLOR

Slip to dry	<u>3</u> %	Raw	-----
	*		
Fired cone .04	-----	% Cone .04	-----
	*		
Fired cone .02	-----	% Cone .02	-----
	*		
Total shrinkage	-----	%	



Dry strength (pounds per square inch) 465 lbs.

Absorption. cone .04 76.31 % cone .02 66.66 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This test crumbles easily in the green-ware state, and when fired it is soft and crumbly. It is too porous to use.

* No test could be made.

Test 59 Locality SE 1/4 of NE 1/4 Section 23 Township 12 Range 20 County Ellis

Characteristics of deposit --large deposit deeply eroded on both sides of the road.

Slaking qualities --slakes immediately.

Per cent of coarse material not passing mesh No. 80 25 %

Plasticity --practically none.

Per cent of water of plasticity 44 %

SHRINKAGE

COLOR

Slip to dry	<u>3</u> %	Raw	-----
	*		
Fired cone .04		% Cone .04	-----
	*		
Fired cone .02		% Cone .02	-----
	*		
Total shrinkage		%	-----



Dry strength (pounds per square inch) 140 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This clay is slightly gritty, crumbles easily, and air-slakes after being fired. It has no value for pottery use.

* No test could be made.

Test 60 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 26 Township 12 Range 20 County Ellis

Characteristics of deposit --small deposit from bank on the west side of the road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 13 %

Plasticity --very little.

Per cent of water of plasticity 42 %

SHRINKAGE

COLOR

Slip to dry 8 % Raw _____

Fired cone .04 * % Cone .04 _____

Fired cone .02 * % Cone .02 _____

Total shrinkage * %

Dry strength (pounds per square inch) 765 lbs.

Absorption. cone .04 37 % cone .02 36.83 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This sample has a high content of sand and is chalky and porous when fired. It does not have enough plasticity to be of any value as a pottery or modeling clay.



* No test could be made.

Test 62 Locality NW $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 3 Township 13 Range 19 County Ellis

Characteristics of deposit --large deposit on hill-side on the west side of the road.

Slaking qualities --breaks down readily.

Per cent of coarse material not passing mesh No. 80 1 %

Plasticity --practically none.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry * % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 1005 lbs.

Absorption. cone .04 16.85 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed *

Remarks and conclusions This clay broke in the mold. At cone .02 it became liquid and spread over the shelf. It could not be used as a pottery body.

* No test could be made.

Test 63 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 2 Township 13 Range 19 County Ellis

Characteristics of deposit --small deposit from bank on the west side of the road near a house.

Slaking qualities --breaks down easily.

Per cent of coarse material not passing mesh No. 80 2 $\frac{1}{2}$ %

Plasticity --not very plastic.

Per cent of water of plasticity 40%

SHRINKAGE

COLOR

Slip to dry * %Raw

Fired cone .04 * %Cone .04

Fired cone .02 * %Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 750 lbs.

Absorption. cone .04 31.03% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This sample has a high sand content and crumbles easily. It becomes vitrified and slightly fluid at cone .02 and is of no value as a pottery body.

* No test could be made.

Test 64 Locality NE $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 11 Township 13 Range 19 County Ellis

Characteristics of deposit --thick vein from deep cut near stream.

Slaking qualities --breaks down rapidly.


Per cent of coarse material not passing mesh No. 80 2%

Plasticity --very little.

Per cent of water of plasticity 40%

SHRINKAGE

COLOR

Slip to dry	*	% Raw	
Fired cone .04	*	% Cone .04	
Fired cone .02	*	% Cone .02	
Total shrinkage	*	%	

Dry strength (pounds per square inch) 600 lbs.

Absorption. cone .04 21.8% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This sample is quite sandy, has very little strength, and vitrifies at cone .02. It is too dark to be used.

* No test could be made.

Test 65 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 2 Township 13 Range 19 County Ellis

Characteristics of deposit --large deposit found in ditch on the north side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 9 %

Plasticity --very little.

Per cent of water of plasticity 34 %

SHRINKAGE

COLOR

Slip to dry * % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 705 lbs.

Absorption. cone .04 23.18 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This sample is very sandy and crumbles easily.

It becomes vitrified and fluid at cone .02 and is of no value for a pottery body.

* No test could be made.

Test 66 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 1 Township 13 Range 19 County Ellis

Characteristics of deposit --large deposit under two feet of top soil in ditch on the north side of road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 9 %

Plasticity --not very plastic.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----



Dry strength (pounds per square inch) 795 lbs.

Absorption. cone .04 20.34 % cone .02 2.36 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --glazes well.

Remarks and conclusions This test is very sandy, breaks easily, and is too dark to be of any value.

* No test could be made.

Test 67 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 17 Township 13 Range 18 County Ellis

Characteristics of deposit --large deposit found in high bank on the east side of the road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 3 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity 42%

SHRINKAGE

COLOR

Slip to dry	*	% Raw
Fired cone .04	*	% Cone .04
Fired cone .02	*	% Cone .02
Total shrinkage	*	%



Dry strength (pounds per square inch) 900 lbs.

Absorption. cone .04 15.38% cone .02 2.35%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --glazes well.

Remarks and conclusions This test is very sandy, crumbles easily, and becomes very dense at cone .02. It is too dark in color to be used for a pottery clay.

* No test could be made.

Test 68 Locality SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 20 Township 13 Range 18 County Ellis

Characteristics of deposit --deposit found on high bank on the west side of the road, one half mile south of the bridge over Big Creek.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 4 %

Plasticity --practically none.

Per cent of water of plasticity 34 %

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * %



Dry strength (pounds per square inch) 125 lbs.

Absorption. cone .04 29.26 % cone .02 2.63 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --glazes well.

Remarks and conclusions This sample is very sandy, crumbles easily, and is of no value as a pottery clay.

* No test could be made.

Test 69 Locality NE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 17 Township 15 Range 18 County Ellis

Characteristics of deposit --large deposit covered by two feet of top soil found in a ditch at the left side of the road.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 3 $\frac{1}{2}$ %

Plasticity --medium plasticity.

Per cent of water of plasticity 46%

SHRINKAGE

COLOR

Slip to dry 8% Raw -----

Fired cone .04 4% Cone .04 -----

Fired cone .02 0% Cone .02 -----

Total shrinkage 12%

Dry strength (pounds per square inch) 615 lbs.

Absorption. cone .04 26.05% cone .02 36.17%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts well.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This test is sandy, of medium strength and too porous to be of any value for pottery use.



* No test could be made.

Test 70 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 20 Township 15 Range 18 County Ellis

Characteristics of deposit --six inch vein at the east end of cement cul-
vert under test seventy one.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80..... 4 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity..... 32%

SHRINKAGE

COLOR

Slip to dry..... * % Raw

Fired cone .04..... * % Cone .04.....

Fired cone .02..... * % Cone .02.....

Total shrinkage..... * %



Dry strength (pounds per square inch)..... 340 lbs.

Absorption. cone .04..... 17.39%..... cone .02..... 18.18%

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This sample is sandy, crumbles easily, and is
soft when fired. The color is good but the ware cannot be cast.

* No test could be made.

Test 71 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 20 Township 15 Range 18 County Ellis

Characteristics of deposit --vein six feet thick covered with five feet of soil and gravel.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80..... 8%

Plasticity --some.

Per cent of water of plasticity..... 52%

SHRINKAGE

COLOR

Slip to dry..... 6% Raw

Fired cone .04..... 1% Cone .04.....

Fired cone .02..... *% Cone .02.....

Total shrinkage..... *%



Dry strength (pounds per square inch)..... 330 lbs.

Absorption. cone .04..... 13.29% cone .02..... 66.46%

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The green-ware of this sample is not very strong, and when fired, is very soft and chalky. It is of no value for pottery.

* No test could be made.

Test 72 Locality NW¹ of NW¹ Section 25 Township 15 Range 19 County Ellis

Characteristics of deposit --high bank of shale on river east of cement bridge.

Slaking qualities --slakes easily.

Per cent of coarse material not passing mesh No. 80 42¹ %

Plasticity --not very plastic.

Per cent of water of plasticity 48 %

SHRINKAGE

COLOR

Slip to dry * % Raw _____

Fired cone .04 * % Cone .04 _____

Fired cone .02 * % Cone .02 _____

Total shrinkage * % _____

Dry strength (pounds per square inch) 325 lbs.

Absorption. cone .04 69.13 % cone .02 69.81 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This test has no density. It crumbles easily in the green-ware state, and when fired, is soft and chalky. It is of no value as a pottery body.

* No test could be made.



Test 73 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 6 Township 15 Range 19 County Ellis

Characteristics of deposit --large deposit in a deep cut east of stone
culvert.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 1%

Plasticity --very little.

Per cent of water of plasticity 40%

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * % -----

Dry strength (pounds per square inch) 1180 lbs.

Absorption. cone .04 16.28 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --glazes well.

Remarks and conclusions This test is quite sandy, crumbles easily, and
vitriifies at cone .02. It is too dark to be used.



* No test could be made.

Test 74 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 35 Township 14 Range 20 County Ellis

Characteristics of deposit --large deposit in high bank on the east side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 7 %

Plasticity --very little.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry 7 % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %

Dry strength (pounds per square inch) 720 lbs.

Absorption. cone .04 20.45 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This sample is sandy, crumbles easily, and becomes slightly fluid at cone .02. It is of no value as a pottery body.



* No test could be made.

Test 75 Locality SW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 35 Township 11 Range 20 County Ellis

Characteristics of deposit --large deposit from bluff one quarter mile west of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 1 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity 54%

SHRINKAGE

COLOR

Slip to dry 3% Raw -----

Fired cone .04 3% Cone .04 -----

Fired cone .02 * Cone .02 -----

Total shrinkage *% -----

Dry strength (pounds per square inch) 540 lbs.

Absorption. cone .04 57.4% cone .02 55.73%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay is sandy, crumbles easily in the green-ware state, and is very soft and chalky when fired. It is too porous for a good clay.

* No test could be made.



Test 76 Locality SW $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 11 Township 12 Range 20 County Ellis

Characteristics of deposit --large deposit one quarter mile west of the road between high hills.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 6 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity 48%

SHRINKAGE

COLOR

Slip to dry 5% Raw -----

Fired cone .04 *% Cone .04 -----

Fired cone .02 *% Cone .02 -----

Total shrinkage *%

Dry strength (pounds per square inch) 615 lbs.

Absorption. cone .04 50.35% cone .02 42.65%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay is sandy and crumbles easily. When fired the ware is soft and porous and is of no value in its pure form.

* No test could be made.



Test 77 Locality NW $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 11 Township 12 Range 20 County Ellis

Characteristics of deposit --small deposit from old stone quarry one hundred yards west of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 0 %

Plasticity --very little.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry 4 % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 185 lbs.

Absorption. cone .04 * % cone .02 * %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed *

Remarks and conclusions This clay is sandy and has very little plasticity. It air-slakes after firing and is of no value as a pottery clay.

* No test could be made.

Test 78 Locality NE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 28 Township 15 Range 18 County Ellis

Characteristics of deposit --large deposit one quarter mile north of
creek on cut through hill.

Slaking qualities --slakes slowly.

Per cent of coarse material not passing mesh No. 80..... 8 %

Plasticity --very little.

Per cent of water of plasticity..... 48 %

SHRINKAGE

COLOR

Slip to dry..... * % Raw

Fired cone .04..... * % Cone .04.....

Fired cone .02..... * % Cone .02.....

Total shrinkage..... * %



Dry strength (pounds per square inch)..... 525 lbs.

Absorption. cone .04..... 38.71 %..... cone .02..... 48.27 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This test crumbles easily in the green-ware
state, and is soft and chalky when fired. It is of no value as a
pottery clay.

* No test could be made.

Test 79 Locality NE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 12 Township 15 Range 17 County Ellis

Characteristics of deposit --large deposit in high bank.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 11 %

Plasticity --very little.

Per cent of water of plasticity 46 %

SHRINKAGE

COLOR

Slip to dry * % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 510 lbs.

Absorption. cone .04 48.94 % cone .02 65.85 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay is too soft, crumbles easily in the green-ware state, and is very porous and soft when fired. It is of no value as a pottery clay.

* No test could be made.

Test 80 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 1 Township 15 Range 17 County Ellis

Characteristics of deposit --small deposit in the ditch on the north side of the road.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --fairly plastic.

Per cent of water of plasticity 44%

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * %



Dry strength (pounds per square inch) 795 lbs.

Absorption. cone .04 12.47% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed --glazes well.

Remarks and conclusions This clay vitrifies at cone .02, is hard in the green-ware, but cracks when drying. It is too dark to be used as a pottery clay.

* No test could be made.

Test 81 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 25 Township 14 Range 17 County Ellis

Characteristics of deposit --found in drainage ditch at the side of the road fifty yards west of culvert.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80..... 19 %

Plasticity --medium plasticity.

Per cent of water of plasticity..... 30 %

SHRINKAGE

COLOR

Slip to dry..... * % Raw

Fired cone .04..... * % Cone .04.....

Fired cone .02..... * % Cone .02.....

Total shrinkage..... * %

Dry strength (pounds per square inch)..... 750 lbs.

Absorption. cone .04..... 28.33 %..... cone .02..... 0 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --cracks in mold.

Action when glazed. *

Remarks and conclusions This clay is quite hard in the green-ware but cracked when drying. It became quite fluid when fired to cone .02, and is of no value as a pottery body.



* No test could be made.

Test 82 Locality SW¹ of SW¹ Section 14 Township 14 Range 17 County Ellis

Characteristics of deposit --found in bottom of drainage ditch on the north side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 1/2 %

Plasticity --very little.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry * % Raw Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 705 lbs.

Absorption. cone .04 20 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed --glazes well.

Remarks and conclusions This clay is too sandy, crumbles easily, and vitrifies at cone .02. It is too dark to be used as a body for pottery.

* No test could be made.

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Test 83 Locality SW $\frac{1}{2}$ of SW $\frac{1}{2}$ Section 17 Township 14 Range 17 County Ellis

Characteristics of deposit --small deposit from drainage ditch on north side of road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 11 %

Plasticity very little.

Per cent of water of plasticity 40 %

SHRINKAGE

COLOR

Slip to dry	-----	* %Raw	-----
Fired cone .04	-----	* %Cone .04	-----
Fired cone .02	-----	* %Cone .02	-----
Total shrinkage	-----	* %	-----



Dry strength (pounds per square inch) 750 lbs.

Absorption. cone .04 23.73 % cone .02 0.84 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The green-ware is hard but cracks when drying. The ware is very dense at cone .02 but is too dark to be used for pottery making.

* No test could be made.

Test 84 Locality SE $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 24 Township 14 Range 18 County Ellis

Characteristics of deposit --deposit found in large bank three fourths
mile west of Munjor.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 7 %

Plasticity --very little.

Per cent of water of plasticity 32 %

SHRINKAGE

COLOR

Slip to dry 5 % Raw

Fired cone .04 1 % Cone .04

Fired cone .02 2 % Cone .02

Total shrinkage 8 %

Dry strength (pounds per square inch) 705 lbs.

Absorption. cone .04 21.12 % cone .02 14.33 %

Warpage. (in mm from horizontal) at cone .02 3 mm

Action in mold --casts well.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions The green-ware of this clay is of medium
strength but is quite sandy. The ware has some possibilities but
is too porous for a good body.



Test 85 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 22 Township 14 Range 18 County Ellis

Characteristics of deposit --large deposit covered by two feet of top

--soil.

Slaking qualities --slakes very slowly.

Per cent of coarse material not passing mesh No. 80 6 %

Plasticity --very, very plastic--quite sticky.

Per cent of water of plasticity 44 %

SHRINKAGE

COLOR

Slip to dry 14 % Raw

Fired cone .04 4 % Cone .04

Fired cone .02 2 % Cone .02

Total shrinkage 20 %

Dry strength (pounds per square inch) 1030 lbs.

Absorption. cone .04 10.58 % cone .02 1.58 %

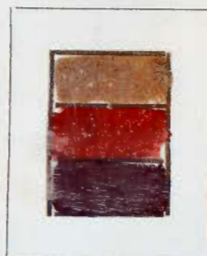
Warpage. (in mm from horizontal) at cone .02 10 mm

Action in mold --molds well.

Action when glazed --glazes well.

Remarks and conclusions The green-ware is very hard and durable and
feels slick and soapy. The ware is very dense and hard but is too
dark to be used as a pottery clay.

* No test could be made.



Test 86 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 19 Township 14 Range 18 County Ellis

Characteristics of deposit --large deposit found in a ditch on the north side of the road.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 6 $\frac{1}{2}$ %

Plasticity --very plastic.

Per cent of water of plasticity 46%

SHRINKAGE

COLOR

Slip to dry *% Raw

Fired cone .04 *% Cone .04

Fired cone .02 *% Cone .02

Total shrinkage *%

Dry strength (pounds per square inch) 1280 lbs.

Absorption. cone .04 13.51% cone .02 0%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in the mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay has medium strength in the green-ware but cracks while drying. It vitrifies at cone .02 but is too dark to be of much value.

* No test could be made.



Test 87 Locality SW¹ of SW¹ Section 23 Township 14 Range 19 County Ellis

Characteristics of deposit --small deposit under two feet of top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 7 %

Plasticity --very little.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry * % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 600 lbs.

Absorption. cone .04 20.13 % cone .02 6.47 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is sandy and crumbles easily in the green-ware state but becomes quite dense upon being fired to cone .02. The dark color and breakage are faults too difficult to overcome.

* No test could be made.

Test 88 Locality SW 1/4 of NW 1/4 Section 3 Township 14 Range 19 County Ellis

Characteristics of deposit --large deposit on the east side of the road north of a farm house.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 2 %

Plasticity --quite plastic.

Per cent of water of plasticity 36 %

SHRINKAGE

COLOR

Slip to dry * % Raw

Fired cone .04 * % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 1035 lbs.

Absorption. cone .04 13.51 % cone .02 7.14 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is hard in the green-ware state but cracks when drying, and is too dark to be usable.

* No test could be made.

Test 89 Locality SW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 34 Township 13 Range 19 County Ellis

Characteristics of deposit This vein of clay is two feet thick and is covered with four feet of top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 17 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity 36%

SHRINKAGE

COLOR

Slip to dry 4% Raw

Fired cone .04 0% Cone .04

Fired cone .02 2% Cone .02

Total shrinkage 6%

Dry strength (pounds per square inch) 585 lbs.

Absorption. cone .04 69.1% cone .02 32.88%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --casts very well.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay has medium strength in the green-ware state but has a high content of sand. The ware is soft and crumbles easily when fired and is of no value as a pottery clay.

* No test could be made.



Test 90 Locality NW 1/4 of SW 1/4 Section 27 Township 13 Range 19 County Ellis

Characteristics of deposit --large deposit on hillside on winding road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80..... 3 %

Plasticity --very little.

Per cent of water of plasticity..... 34 %

SHRINKAGE

COLOR

Slip to dry..... * % Raw

Fired cone .04..... * % Cone .04.....

Fired cone .02..... * % Cone .02.....

Total shrinkage..... * %



Dry strength (pounds per square inch)..... 405 lbs.

Absorption. cone .04..... 15.82 %..... cone .02..... 27.41 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in the mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is very sandy and crumbles easily.

It sticks to the mold and is not plastic enough to be usable.

* No test could be made.

Test 91 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 27 Township 13 Range 19 County Ellis

Characteristics of deposit --large deposit of clay in hillside two hundred yards north of brown house.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80..... 1 %

Plasticity --quite plastic.

Per cent of water of plasticity..... 40 %

SHRINKAGE

COLOR

Slip to dry..... 9 % Raw

Fired cone .04..... 1 % Cone .04.....

Fired cone .02..... * % Cone .02.....

Total shrinkage..... * %

Dry strength (pounds per square inch)..... 385 lbs.

Absorption. cone .04..... 9.55 % cone .02..... 4.51 %

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions This clay has medium strength and a silky texture in the green-ware state, but the test broke in the first fire.

This ware is too dark to be used successfully in pottery making.

* No test could be made.



Test 92 Locality SE $\frac{1}{4}$ of NE $\frac{1}{4}$ Section 21 Township 13 Range 19 County Ellis

Characteristics of deposit --large deposit found in hillside.

Slaking qualities --poor--must be churned.

Per cent of coarse material not passing mesh No. 80 4 %

Plasticity --very, very plastic.

Per cent of water of plasticity 48 %

SHRINKAGE

COLOR

Slip to dry 11 % Raw

Fired cone .04 7 % Cone .04

Fired cone .02 2 % Cone .02

Total shrinkage 20 %

Dry strength (pounds per square inch) 645 lbs.

Absorption. cone .04 7.04 % cone .02 0 %

Warpage. (in mm from horizontal) at cone .02 0 mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions The green-ware is very strong and has a fine texture. The test vitrifies at cone .02 but is too dark to be used.



Test 93 Locality NW¹/₄ of NW¹/₄ Section 1 Township 14 Range 19 County Ellis

Characteristics of deposit --large deposit on the west side of a hill.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80 2%

Plasticity --medium.

Per cent of water of plasticity 36%

SHRINKAGE

COLOR

Slip to dry 9% Raw

Fired cone .04 3% Cone .04

Fired cone .02 0% Cone .02

Total shrinkage 12%

Dry strength (pounds per square inch) 795 lbs.

Absorption. cone .04 9.23% cone .02 0.83%

Warpage. (in mm from horizontal) at cone .02 1 mm

Action in mold --casts well.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is slightly sandy, has medium strength in the green-ware state, and becomes very dense upon firing. The clay is too dark to be of much value for pottery making.



Test 94 Locality NW 1/4 of SE 1/4 Section 31 Township 13 Range 18 County Ellis

Characteristics of deposit --clay from the bottom of a pit silo one and one-half miles west of Hays.

Slaking qualities --slakes rapidly.

Per cent of coarse material not passing mesh No. 80 7 %

Plasticity --very plastic.

Per cent of water of plasticity 40 %

SHRINKAGE

COLOR

Slip to dry 10 % Raw

Fired cone .04 8 % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %

Dry strength (pounds per square inch) 750 lbs.

Absorption. cone .04 3.77 % cone .02 0.27 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --cracks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is very hard in the green-ware state.

The test broke in the second firing at cone .02 and is too dark to use.

* No test could be made.



Test 95 Locality NW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 13 Township 14 Range 18 County Ellis

Characteristics of deposit --large deposit on the west side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80..... 3 $\frac{1}{2}$ %

Plasticity --practically none.

Per cent of water of plasticity..... 32%

SHRINKAGE

COLOR

Slip to dry..... *% Raw

Fired cone .04..... *% Cone .04.....

Fired cone .02..... *% Cone .02.....

Total shrinkage..... *%

Dry strength (pounds per square inch)..... 615 lbs.

Absorption. cone .04..... 25.42%..... cone .02..... 15.79%

Warpage. (in mm from horizontal) at cone .02..... * mm

Action in mold --breaks in the mold.

Action when glazed The clay absorbs the glaze.

Remarks and conclusions This clay is sandy and crumbles easily in the green-ware state. When fired the clay is soft and chalky and is of no use for making pottery.

* No test could be made.



Test 96 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 3 Township 14 Range 17 County Ellis

Characteristics of deposit --small deposit in drainage ditch under two feet of top soil.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 6 %

Plasticity --very little.

Per cent of water of plasticity 24 %

SHRINKAGE

COLOR

Slip to dry 6 % Raw

Fired cone .04 2 % Cone .04

Fired cone .02 * % Cone .02

Total shrinkage * %

Dry strength (pounds per square inch) 720 lbs.

Absorption. cone .04 17.81 % cone .02 9.41 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions The clay is sandy and crumbles easily in the green-ware state. The test broke in the cone .02 fire. It breaks easily and is not a good pottery clay.

* No test could be made.



Test 97 Locality NW $\frac{1}{4}$ of NW $\frac{1}{4}$ Section 3 Township 14 Range 17 County Ellis

Characteristics of deposit --large deposit in bank on the east side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 3 %

Plasticity --very little.

Per cent of water of plasticity 28 %

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * %



Dry strength (pounds per square inch) 630 lbs.

Absorption. cone .04 20 % cone .02 17.85 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is very sandy and crumbles easily.

It does not have enough plasticity to be of much value for a pottery clay.

* No test could be made.

Test 98 Locality SE $\frac{1}{4}$ of SE $\frac{1}{4}$ Section 35 Township 13 Range 17 County Ellis

Characteristics of deposit --a large deposit exposed by grader on the side of the road.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 2 $\frac{1}{2}$ %

Plasticity --very little.

Per cent of water of plasticity 26 %

SHRINKAGE

COLOR

Slip to dry * % Raw _____

Fired cone .04 * % Cone .04 _____

Fired cone .02 * % Cone .02 _____

Total shrinkage * %



Dry strength (pounds per square inch) 705 lbs.

Absorption. cone .04 19.3 % cone .02 13.46 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is very sandy and crumbles easily.

It is too dark in color and does not have enough plasticity to be used as a pottery clay.

* No test could be made.

Test 99 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 36 Township 12 Range 17 County Ellis

Characteristics of deposit --large deposit exposed by grader on top of small hill.

Slaking qualities --breaks down slowly.

Per cent of coarse material not passing mesh No. 80.. 4%

Plasticity --very plastic.

Per cent of water of plasticity 36%

SHRINKAGE

COLOR

Slip to dry * % Raw -----

Fired cone .04 * % Cone .04 -----

Fired cone .02 * % Cone .02 -----

Total shrinkage * %



Dry strength (pounds per square inch) 525 lbs.

Absorption. cone .04 15.23 % cone .02 7.42 %

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks in mold.

Action when glazed --takes glaze well.

Remarks and conclusions This clay is hard in the green-ware state but breaks when drying. It is too dark to be used as a pottery clay.

* No test could be made.

Test 100 Locality SW $\frac{1}{4}$ of SW $\frac{1}{4}$ Section 25 Township 12 Range 17 County Ellis

Characteristics of deposit --sandy clay exposed by grader in cut through small hill.

Slaking qualities --breaks down rapidly.

Per cent of coarse material not passing mesh No. 80 4 $\frac{1}{2}$ %

Plasticity --practically none.

Per cent of water of plasticity 32%

SHRINKAGE

COLOR

Slip to dry * %Raw

Fired cone .04 * %Cone .04

Fired cone .02 * %Cone .02

Total shrinkage * %



Dry strength (pounds per square inch) 290 lbs.

Absorption. cone .04 27% cone .02 24.39%

Warpage. (in mm from horizontal) at cone .02 * mm

Action in mold --breaks and sticks to mold.

Action when glazed The glaze is full of small bubbles.

Remarks and conclusions This clay is very sandy and crumbles easily.

It is too dark in color and does not have enough plasticity to be of any value as a pottery clay.

* No test could be made.

Chapter III

Conclusions with reference to the clays of Ellis County for pottery making.

The north half of Ellis County from Big Creek to the Saline River has numerous deposits of clay, while the south half of the county has few outcroppings. From Big Creek to the Smoky Hill River on the south, any clay there may be is covered by a rich top soil which has filled the lowlands from the hills north of Hays, to the low hills along the river.

There are numerous deposits of shale in the hills south of the Saline which could be used commercially for tile or brick manufacture, however, their dark color lessens their value as a body for the making of art pottery.

A few light firing clays were found, but without exception, their high content of sand, and subsequent high porosity, make their successful use doubtful.

The clay nearest approaching the ideal as far as color, density, size of deposit, shrinkage, and casting possibilities are concerned, is No. 1, found about one-half mile north of Yocemento.

Although few clays tested were good enough to warrant their use in a pottery laboratory or commercial factory, there are several that could be used successfully in the classroom in either modeling or making simple, hand-built pottery.

The following tests were picked as the best ones suitable for the teacher in the rural school of this county who may wish to obtain some clay with which to experiment in her classes. These tests were chosen because of their plastic qualities and because they can be fired. Although all but No. 1 fired to a dark color, they are suitable for ordinary class-room use.

Tests of usable clays---for location, see map.

1---7---9---10---11---21---23---26---28---29---33---34---41---42---54
61---73---80---81---85---86---92---93.

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