

**TESTIMONY ON THE
CLAYS AND SATTLER
PAVING BRICK**

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Testimony on the Clays and Sattler Paving Brick by Various

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VARIOUS

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PREFACE.

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THE following testimony is extracted from that portion of the proceedings before the Special Commissioners, appointed by the St. Louis Circuit Court No. 3, case No. 78801, to condemn the Albert M. Meints tract, that bears directly on the clays that are found underlying said lands, and the Sattler paving brick made therefrom.

A strip about 945 feet long by 60 feet wide was desired by the City, along the East side of the Columbia Bottom Road, on which to construct the conduit required for the new Chain of Rocks system of water-works, and the subsequent testimony was part of the evidence presented to the Commissioners to enable them to arrive at the value of the strip of land desired by the City.

The Commissioners consisted of:

PROF. WM. B. POTTER, Chairman,
LEWIS ROSENBAUM, Secretary,
JOHN C. LULLMANN.

Chas. C. Broadhead was counsel for the plaintiff, and Daniel T. Jewett for the defence. Sittings extending from Oct. 31, 1888 to May 1, 1889 were held, at which various witnesses were examined in reference to the value of the land in that neighborhood for farming, clay-mining, and other purposes, and the subsequent testimony is selected from that portion of the evidence which bears directly on the clays and the paving bricks made therefrom, as given by competent experts.

Though the Commissioners decided that the owner was only entitled to the nominal value of \$500 per acre, as they said that only its present market value, for the purpose for

which it was used, could be entertained, they acknowledged the high value of the property for its underlying clays; but as the utilization of these clays was a matter of the future, as no clay had thus far been mined from the strip under their consideration, it would be beyond their jurisdiction to consider values that depended on future developments.

Their report, stripped of descriptions and other preliminaries, is given hereafter.

Stars indicate the omission of testimony that related to personal matters before the Commissioners, but which was of no interest or had any bearing to the matter hereinafter reproduced.



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 20 Jan 81 MKP

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TESTIMONY OF PROF. H. A. WHEELER.

Consulting Mining Engineer.

TESTIFIED that he is a mining engineer.

That he had visited and examined the Meints land desired by the City of St. Louis for its new conduit.

That four test pits had been sunk on said strip of land, on a line parallel with and about 20 feet East of the Columbia Bottom Road at the following distances from the South line of said strip :

No. 1.....	157 feet.
No. 2.....	373 "
No. 3.....	678 "
No. 4.....	828 "
(North Boundary...)	948 ")

That he had carefully examined and sampled each of these pits.

That No. 1 Pit had only been sunk through the top clays to the "paving-brick" or fire clay, which was found in place, under an 18-inch seam of good bituminous coal, at a depth of 17 feet.

That No. 2 Pit was 34 feet deep and 4 by 4 feet in size ; that there was 22 feet of "paving-brick" or fire clay in the lower part of the pit, over which is 7.5 feet of mixed yellow and fire-clay, suitable for sewer pipe, and on top was 7.5 feet of common red-brick clay.

That No. 3 Pit was 32 feet deep and 4 feet diameter ; that there was two feet of the very best grade of fire-clay or "pot clay" at the bottom ; over which was 11.5 feet of "paving-brick" or fire-clay, above which was 4 feet of "sewer-pipe" clay, and on top 12 feet of common red-brick clay.

That No. 4 Pit was 16.5 feet deep, having only been sunk to the top of the "paving-brick" or fire-clay, which was found in place ; that the "sewer pipe clay" resting on the "paving-brick" clay was 8 feet thick and topped with 6 feet of common red-brick clay.

Testified that the "paving brick" clay contained on an average about 3 feet of a purer clay, which by washing will make a pot clay.

Also that there is a strata of boulders from 1.5 to 2 feet thick in the paving brick clay, which will have to be picked out in working the deposit.

That an average thickness of the clays on the 60 ft. strip, as shown by the above four test-pits, would be:

KIND:	AVERAGE THICKNESS:
Pot Clay	1 foot.
Wash Pot Clay	3 feet.
Paving Brick Clay	13 "
Sewer Pipe Clay	7.5 "
Common Red Brick Clay	10.0 "
Total	34.5 feet.

THE POT CLAY.

TESTIFIED that the pot clay was of a very high quality for this class of especially high-grade fire clay, and showed burned and raw samples of same for direct comparison with samples of the famous imported Coblenz (German) pot clay, in which the comparison was very favorable. Also produced a letter from Thos. Coffin & Co., of Pittsburg, an extensive and long established glass-pot manufacturing concern, who had made a glass-pot from this clay which they stated had stood very well, lasting ten weeks in the glass furnace; the clay from which this pot was made had come from the Meints land on the West side of the Columbia Bottom Road, but which strong geological evidence indicated was identical with the pot clay on the East side of the road.

That the market value of such pot clay at present is \$12 to \$14 a ton, and as the cost of mining should not exceed \$5.00 a ton (see estimate on page 17) with the very favorable conditions for working it by open pits on the East side (after the upper clays have been removed), the net profit per ton in working it should be over \$5.00 a ton.

THE WASH POT CLAY.

TESTIFIED to the high quality of the wash pot clay made by washing a sample of 14 pounds taken from the 3 feet of the thick bed of fire clay, which contained less iron, in the form of minute crystals of pyrites or "shiners", than the rest of the bed. Analysis of the crude clay, before washing, and of the washed clay was given, to show the improvement effected by the washing, in lowering the amount of impurities present in the clay.

ANALYSIS OF THE WASH POT CLAY.

	CRUDE CLAY.	WASHED CLAY.
Silica	53.54	
Alumina	28.21	
Water (combined).....	13.26	
Total of Essential Constituents....	<u>95.01</u>	
Iron.....	2.80	2.30
Lime.....	1.01	0.47
Magnesia	0.11	0.06
Alkalies	0.76	0.66
Total of Impurities.....	<u>4.68</u>	<u>3.49</u>
Grand Total of all Constituents ..	99.69	

Stated that the washed clay had all passed through an 80-mesh seive (with 6400 holes to the square inch), and that the crude clay yielded 85 per cent. of this very fine wash clay, as washed by the usual process in purifying clays. Burned Samples of the washed clay showed that the iron, which was its principle impurity, was very finely and uniformly disseminated through the clay, and therefore in a condition to do no harm, while this impurity was the least deleterious of the usual impurities in fire clays. Also, that the wash pot clay made from the Meints land was superior to many of the pot clays in use, being purer and more reliable, and quoted analysis of several pot clays from different authorities for direct comparison.

ANALYSES OF POT CLAYS.

CONSTITUENTS	I	II	III	IV	V	VI	VII	VIII	IX	X	
SILICA.....	55.06	59.60	64.32	47.33	63.10	47.12	55.40	57.31	45.73		Non-Injurious Constituents.
ALUMINA.....	30.02	26.41	22.82	35.02	23.70	34.10	26.40	26.58	34.14		
WATER.....	10.54	10.48	10.26	10.51	10.73	12.35	12.00	10.78	14.62		
TOTAL OF ESSENTIAL CONSTITUENTS.....	95.62	96.49	97.40	92.89	97.53	93.57	93.80	94.67	94.49		
IRON (Fe).....	2.30	1.10	1.13	1.23	1.61	1.54	1.74	2.94	2.20	1.89	Injurious Constituents.
LIME.....	0.47	2.20	1.00	0.45	0.16	0.09	?	?	0.71	0.79	
MAGNESIA.....	0.06	0.41	0.07	0.12	1.11	0.06	0.39	?	0.49	0.74	
ALKALIES.....	0.66	?	0.45	0.77	3.18	1.12	1.91	?	0.44	0.45	
TOTAL OF FOREIGN CONSTITUENTS.....	3.49	3.71	2.65	2.57	6.06	1.81	4.04	*2.94	3.84	3.87	
GRAND TOTAL OF ALL CONSTITUENTS.....	99.33	99.14	99.97	98.95	99.34	97.61	96.74	98.57	98.36		

- I. Meints 80 Mesh Wash Pot Clay.
- II. Washed Clay, Dixon, Mo. U. S. Census Report, 1880, Vol. II, p. 40.
- III. Washed Clay, Cheltenham, Mo. " " " " " "
- IV. Crude Clay, Oak Hill, Mo. " " " " " "
- V. German Crude Clay, Grundstalt, Germany, U. S. Census Report, 1880, Vol. II, p. 40.
- VI. Crude Clay, Christy's Mine, Oak Hill, Mo. This is one of the best and purest pot clays known. U. S. Census Report 1880, Vol. II, p. 40.
- VII. Washed Clay, Hohessin, Del. Report on Clays, N. J. Geol. Survey, 1878, p. 300.
- VIII. Crude Clay, La Bouchade, France. Percy's Metallurgy, Vol. I, 1875, p. 101.
- IX. Crude Clay, Congreaves, Stourbridge, England, " " " " " "
- X. Crude Clay, Edgemoat, Sheffield, England, " " " " " "

* This clay undoubtedly contains decided amounts of lime, magnesia and alkalies that have not been determined.

That while clays No. II, VII and VIII of the table (given on page 7) contained more impurities than as quoted, as their analyses were incomplete, especially No. VIII, and though Clay No. VI (Christy's) was one of the very purest pot clays known, yet the average amount of the impurities of these 9 other clays was slightly greater than No. I or the Meints wash pot clay.

Testified that the market value at present for wash pot clay was about \$16.00 a ton, and that the expenses incurred in mining and washing it (see estimate on page 18), with the cheap facilities for working it by open pits, as exist on the East side of the Columbia Bottom Road, should not exceed \$12.59 a ton, leaving a net profit of over \$3.00 a ton on this grade of clay.

THE PAVING BRICK CLAY.

TESTIFIED that the paving brick clay made an exceptionally high quality of paving brick that was eminently adapted for street paving. That the paving brick made from this clay possessed great strength and hardness, and was porous, or not glazed. That the great strength of the paving bricks was due to the high density of the clay, and to the fact that the bricks were made from a pure, simple, unmixed clay. That the density or specific gravity of this clay was remarkably high, it being one of the densest clays known, it having an average density of 2.30 (water being 1.00 or the standard), while the average of 54 well known fire clays was 1.846, as given below:

DENSITY OF FIRE CLAYS.*

- I. Average of 18 Fire Clays, from N.
Raritan River, N. J., ranging from...1.53 to 2.17.... 1.83
- II. Average of 15 Fire Clays, from S.
Raritan River, N. J., ranging from...1.54 to 1.88.... 1.72

* From "Report on Clays," New Jersey Geological Survey, 1878, excepting VIII., which is by Prof. Wheeler.