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## Analyses of Certain Clays Used for Making Paving Brick for Cedar Rapids

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Sec. 13. It shall be the duty of the county auditor in every county to keep a record of all forest and fruit tree reservations within his county.

SEC. 14. The secretary of the Iowa State Horticultural Society shall be state forestry commissioner, without salary. It shall be his duty to promote the objects of this act, and he shall have power to appoint deputies without salary for each county, or group of counties, who shall assist him, and who shall make an annual report to him of forestry matters and of the operations of this act, within their respective territories.

(NOTE.—This bill was subsequently passed by the House, and was favorably reported by the Senate committee on horticulture, but did not receive a constitutional majority in the Senate.)

## ANALYSES OF CERTAIN CLAYS USED FOR MAKING PAVING BRICK FOR CEDAR RAPIDS.

BY C. O. BATES.

The following analyses were made several years ago for Mr. E. P. Boynton, the city engineer of Cedar Rapids. The clays were taken from four companies in Des Moines; each having their plant in a different part of that city.

	Silica $\text{SiO}_2$ .	Alumina $\text{Al}_2\text{O}_3$ .	Iron Oxide $\text{Fe}_2\text{O}_3$ .	Lime $\text{CaO}$ .	Magnesia $\text{MgO}$ .	Total alkalis $\text{Na}_2\text{O}$ and $\text{K}_2\text{O}$ .	Hydroscopic mois- ture $\text{H}_2\text{O}$ .	Ignition loss $\text{H}_2\text{O}$ , $\text{CO}_2$ , S, etc.	
C-0	55.25	25.60	5.52	1.75	1.49	1.79	3.27	5.07	99.74
C-1	53.08	24.93	9.00	.94	1.84	1.19	3.29	5.73	100.00
C-2	61.18	21.69	5.88	.51	1.92	1.96	1.27	5.01	99.42
C-3	68.60	18.93	6.12	.25	.68	.74	1.80	2.80	99.92
C-4	65.62	16.83	8.64	.42	2.00	1.66	.60	4.10	99.87
C-5	51.35	27.38	6.60	1.45	2.62	2.34	2.81	5.42	99.97
C-6	58.42	20.04	7.80	1.68	2.67	1.56	2.39	5.40	99.96
I-1	55.98	25.65	5.88	.74	1.88	1.95	3.72	3.73	99.53
I-2	81.79	10.25	3.24	.52	.57	1.75	.58	1.27	99.97
I-3	68.50	88.45	5.28	1.19	1.42	1.27	.88	2.82	99.81
I-4	52.88	24.27	11.28	.52	2.05	1.92	3.46	3.28	99.64
I-5	66.73	20.28	3.24	.70	.90	1.46	1.70	4.92	99.93
I-6	64.60	20.25	6.72	1.20	1.02	1.33	1.14	3.74	100.00
I-6 $\frac{1}{2}$	64.82	21.00	5.76	.42	2.48	2.11	.33	3.10	100.02
I-7	57.25	22.50	7.92	.90	2.28	1.41	3.88	3.62	99.76
I-8	53.05	25.92	8.76	1.00	2.73	1.29	2.70	4.40	99.85
D-1	70.29	15.18	7.32	.80	1.72	1.49	1.02	2.18	100.00
D-2	59.18	21.63	9.00	1.06	1.85	1.52	1.95	3.80	99.99
D-3	64.60	19.20	7.68	1.02	1.37	1.25	.92	3.95	100.01
D-4	64.41	20.43	5.88	.34	1.71	1.90	1.27	3.93	99.77
D-5	63.23	24.52	5.28	.32	.99	1.16	1.75	2.55	99.80
D-6	76.01	11.94	5.40	1.57	1.04	1.80	.65	1.41	99.82
D-7	67.76	14.46	8.52	1.16	2.36	1.24	.67	3.53	99.70
D-8	55.56	21.33	10.56	1.59	2.94	2.38	.97	4.65	99.98
F-1	70.23	15.68	7.44	.47	1.50	1.28	1.50	1.82	99.90
F-2	69.89	17.68	5.64	1.05	1.68	1.15	.85	1.97	99.91
F-3	58.92	21.45	8.40	.98	2.90	2.49	.57	4.15	99.84
F-4	50.38	27.25	11.54	.96	2.93	1.65	1.45	3.62	99.73
F-5	62.70	21.32	5.88	.16	1.77	1.15	2.12	4.90	100.09
F-6	64.31	17.64	7.68	1.12	2.40	1.15	.42	5.47	99.93
F-7	64.03	20.73	6.72	.36	2.57	1.30	.42	3.50	99.60

(1.) CAPITAL CITY BRICK AND TILE WORKS. This plant is located south of the city. Seven samples were taken which were representative of the principal layers. The following is a description of each, beginning at the top:

	Thickness in feet.
C-0. Clear, medium light drab with slight seams of rust, mastic, very slightly gritty.....	7
C-1. Shale, mottled and streaked maroon to sea green, greenish and purplish brown, rust in seams....	4½
C-2. Shale, medium dark bluish drab, clean.....	7
C-3. Bastard fire clay, mottled purplish blue, dark gray, slight rust in seams.....	4
C-4. Shale, soapy, but containing some grit, clear grayish drab.....	15
C-5. Shale, very dark greenish gray with slight seams of rust..	1½
C-6. Shale, clear blue sandy.....	10

(2.) IOWA BRICK COMPANY. The works of this company are located in the northwestern part of the city on the opposite side of the river from the Flint Brick Company.

Nine samples were taken from this pit. The following is a description of each of the different strata, beginning at the top:

	Thickness in Feet.
I-1. Shale, variegated, reddish brown, mahogany reds, yellowish, bluish drab, dark gray, almost black; the colors mottled parallel to bed.....	6
I-2. Sandy, light yellowish white, solid color.....	6
I-3. Slightly sandy at top to clear shale below, pale blue streaked with chocolate brown.....	5
I-4. Shale, clear chocolate brown.....	4
I-5. Shale, granular, dark solid drab with reddish purple nodules.....	3
I-6. Shale, bluish drab.....	6
I-6½ Same as No. 6. exposed at western end of cut, weathered.....	?
I-7. Shale, streaks of brownish drab and greenish, to chocolate brown. Stratification well defined....	6
I-8. Clear dark drab, with orange green tinge.....	2

(3.) THE DES MOINES BRICK MANUFACTURING COMPANY is located in West Des Moines, between the tracks of the C., R. I. & P. R'y and the Des Moines & Northern R'y.

The following is the description of each of the eight strata in this pit, beginning with the top :

	Thickness in Feet.
D-1. Clay, variegated.....	5
D-2. Shale, streaked in color.....	4
D-3. Shale, solid chocolate brown color, clear definition.	5
D-4. Shale, solid color, clear to poor definition.....	5
D-5. Shale, variegated, clear to poor definition.....	3
D-6. Shale, sandy, solid color....	10
D-7. Shale, sandy, clear definition, solid color, granulated texture, pulverizes in the hand: thickness.	5
D-8. Shale, gray, clear definition. This clay forms 38 to 40 per cent of the bank and runs to underlying coal.....	23

(4.) THE FLINT BRICK COMPANY is located in Oak Park upon the Des Moines river. Seven samples were analyzed from this pit. A complete description of the strata was not obtainable at the time the samples were taken.

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## THE SANITARY ANALYSES OF SOME IOWA DEEP WELL WATERS.

RY J. B. WEEMS.

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In the investigation of deep well waters the interest in many cases has been limited to the mineral substances, and little attention given to the sanitary analysis. This is a natural result when it is realized that these waters contain large amounts of solids and the possibility of contamination by sewage or other products is very slight indeed. In connection with the work of the Department of Agricultural Chemistry of the Agricultural College, analyses of a number of samples of water from the deep wells of the state have been made and the results brought together in hope that they may be of interest. The methods used do not require any explanation as they are those which have been generally used for analyzing water. The oxygen