of lead poisoning where the water passes through lead service pipes.

At Dessau, in Anhalt, where the water is very soft and contains so much CO_2 that lead was dissolved from the service pipes, the excess CO_2 has been removed by the addition of powdered carbonate of lime.

Many waters are contaminated with iron at the source of supply, and this iron not only imparts an unpleasant taste, but is a cause of deposit in the mains rather than a cause of corrosion. Such waters, if rendered slightly acid by vegetable matters, such as peat, deposit a ferruginous slime in the mains, caused by the growth of an organism known as Crenothrix, which is able to thrive under such favoring conditions. The dead organisms impart a bad taste to the water. The remedy is to remove the organic feeding matter by filtration and the iron by aeration. If the acid be neutralized, the iron organisms are not able to develop.

In North Germany, at Konigsberg, 90 per cent. of the iron in solution is removed by aeration. The water is delivered in a fine spray over coke filters, and ferric oxide is deposited in the coke.

The organism causing the black slime has been specially examined by Migula, of Carlsruhe, and has been given the name of Chlamydothrix. He says that the germs come with the water, and attach themselves to the inner surface of the mains. From minute specks of jelly the organisms develop into threads, while iron oxide is deposited by the organisms in the process of growth.

Professor James Campbell Brown says that waters which deposit black slime invariably contain an appreciable quantity of iron in solution in combination with organic matter of an acid character. He thinks that the slime organisms live on the carbon compounds which are found in a soluble organic compound of iron, and iron oxide is deposited throughout their growth.

The flocculent matter which is thus deposited by such iron organisms must not be confused with the corrosion of the mains caused by chemical action and subsequent deposit of the iron dissolved from the mains.

COST OF CONCRETE ROAD.

IN the following itemized table the compiler, Mr. B. P. Lampert, county engineer, Emery, Ia., gives the cost of building a concrete road at Fort Dodge, Ia. Points to be taken into consideration when studying the data are: (1) Average haul, 2½ miles; (2) sand not screened and not charged; (3) engineer's time included, also 1/5 cost of plant used.

Total amount laid, 9,472 square yards. Approximately 3,100 cubic yards of grading (cut and fill).

Labor on Concrete.

Based on average organization and average rate of 500 square yards daily.

No. of men.	Job.	Cost per day.	Cost per sq. yd.
2	Finishing and removing forms	$ 8.00	$0.0160
2	Striking off concrete	5.50	0.0110
1	Fireman on mixer	3.50	0.0070
1	Engineer on mixer	4.00	0.0080
2	Side forms and joints	6.00	0.0120
1	Cement	3.00	0.0060
2	Wheeling and shoveling sand	5.50	0.0110
3	Wheeling stone	8.25	0.0165
6	Shoveling stone	16.50	0.0330
1	Extra, fixing subgrade	2.75	0.0055
1	Water boy	1.00	0.0020
1	Hose boy	1.00	0.0020
23		$65.00	$0.1300

*Not included in calculating cost.

Material and Handling Same.

Job.		Total cost.	Cost per cu. yd.	Cost per sq. yd.
Grading: wheel scraper and wagon work	$ 497.25			
Loading wagons	60.00			
		$ 557.25	....	$0.0588
Surfacing	.....	307.50	....	0.0325
Baker joints and felt	.....	536.40	....	0.0566
Sand, 874 cu. yds. taken from pit:				
Stripping pit	60.00*	.....	....	.....
Loading	129.50	.....	....	.....
Hauling	243.00			
		372.50	$0.426	.0393
Crushed stone, 560.74 cu. yds.	560.74	.....	....	.....
Freight	285.09	.....	....	.....
Loading	141.45	.....	....	.....
Hauling	341.00			
		1,328.28	2.37	.1405
Gravel, 885 cu. yds.	595.04	.....	....	.....
Freight	493.02	.....	....	.....
Loading	123.50	.....	....	.....
Hauling	493.00			
		1,614.56	1.89	.1705
Cement, 2,413 bbls. at $1.56 on cars	3,764.28	.....	....	.....
Hauling	217.17	3,981.45	....	.4203
Total	.....	$8,697.94	....	$0.9183

General Charges.

Freight on mixer, both ways	$184.94		
Engineer	49.70		
		$ 234.64	$ .0247
Miscellaneous teaming	.....	71.43	.0075
Oil, coal, gas, repairs	.....	60.55	.0064
Misc. labor, unloading mixer, laying pipe, building culvert, lost time, etc.	.....	176.69	.0187
Engineering and foreman	....	125.00	.0132
One-fifth of cost of plant	.....	105.00	.0111
		773.31	.0816
Totals, all expenses	.....	$10,750.72	$1.13

A steel dipper dredge of 5 yards' capacity is being completed by the M. Beatty and Sons, Limited, Welland, for the C. S. Boone Dredging and Construction Company, of Toronto, for use in harbor improvement work. The dredge has a hull of 100 feet in length with 40-foot beam, and 10 feet in depth. It is similar to those now being used by the Canadian Dredging Company, Midland; the Dominion Dredging Company, Quebec, and others. It has been used on a wide variety of work, and has established good records for capacity, and low cost of maintenance.