

yearly to the support of the works. Service pipes are of wrought iron, cement lined.

The population in 1880 was 11,111. The consumption is not stated. The works have cost \$82,000 to the present time and the receipts have been \$33,314. There is a bonded debt of \$61,000 at 7 per cent. interest.

For the year ending May 1, 1879, the expenses for maintenance were \$2,764.08 and the receipts from water rates \$3,096.42.

The works are managed by a prudential committee of the water supply district.

CCCXII.—CONNERSVILLE.

Connersville, Indiana, in lat. 39° 40' N., long. 85° 8' W., is on the west fork of Whitewater River, on the bottom lands northwest of the river, back of which the bluff rises to a height of 96 ft.

Settled in 1814, it was incorporated as a city in 1869, in which year water-works were built for the city by the Holly Manufacturing Company, taking the supply from the old White Water Valley canal, which passes through the town and has for some years been used only to furnish water-power.

The water is pumped directly into the mains by a Holly pump driven by water-power, giving an ordinary pressure of 20 lbs. and fire pressure of 80 lbs.

Distribution is by 3 miles of cast-iron pipe of 8, 6, and 4-in. diameter, with 65 fire hydrants and 175 taps. Lead service pipes are used.

The population in 1880 was 3,226. The consumption is not known. The works cost originally \$10,000. No account is kept of the expenses. The receipts for 1880-1 were \$1,200 and for 1881-2 were \$1,000, the falling off being due to the withdrawal of two railroads.

The works are managed by three trustees elected by popular vote, one retiring every year. One-half the receipts from water rents and an additional sum of \$550 raised by taxation go each year to the owners of the water-power, who operate the pumps.

John Verden is the Superintendent, and Anthony Watt, Clerk of the Board.

CCCXIII.—ELYRIA.

Elyria, Ohio, in lat. 41° 28' N., long. 83° 9' W., is on Black River, on level ground.

It was settled in 1815, and, in 1879, water-works were built for a private company by M. S. Frost & Son, after plans of Joseph Flannery, taking the supply from the Black River, across which a stone dam, 4 ft. high and 85 ft. long, forms a basin, from which the water is passed through a stone-walled filter-bed, of 4 ft. of sand, to the pump. A Worthington pump, of 1,000,000 gallons daily capacity, raises the water 100 ft., into a plate-iron tank, 34 ft. in diameter and 20 ft. deep, set on a stone-masonry tower, 80 ft. high, the wall of which is 4½ ft. thick at bottom and 2½ ft. at top. The tank is 75 ft. higher than the city. Distribution is by 8 miles of cast-iron pipe, with 50 fire hydrants, 10 gates, 175 taps and 2 meters.

The town pays \$60 each per year for fire hydrants.

Service pipes are of galvanized iron.

The population in 1880 was 4,500, and the daily consumption, 300,000 gallons.

No financial statements are furnished.

F. R. Persons is Secretary, Treasurer and Manager of the company.

CCCXIV.—FRANKFORT, KY.

Frankfort, Kentucky, in lat. 38° 12' N., long. 84° 54' W. on the Kentucky River, is on an elevated plain between the river and a bluff which rises to a height of 150 ft. The river flows in a deep channel of limestone rock.

It was incorporated in 1786. Water-works were built by the town in 1841, after the plans of James Judge (?) taking the supply from a spring 2½ miles from the town, to which the water is conveyed in a 6-in. cast-iron pipe. The spring is 38 ft. above the town. A dam of stone was built three-quarters of a mile from the spring to make a storage reservoir for the waste water of the spring in the wet season, and a 12-in. pipe laid from it to the town. The stone dam, 200 ft. long, 35 ft. high, 10 ft. wide at bottom and 8 ft. at top, has never held water enough to make this reservoir available, and the pipe was so poorly laid that it has never been used.

The water of a spring is led to a reservoir 80×80 ft. and 6 ft. deep, built of stone masonry.

Distribution is by cast-iron pipe of 4 and 3-in. diameter.

There are no fire hydrants, 8 gates and 500 taps. Service pipes are of lead and iron.

The population in 1880 was 6,979. The consumption is not known, and no financial statistics are given.

B. F. Meek is chairman of the Water Committee, and Samuel J. Shea the Superintendent.

[TO BE CONTINUED.]

ACKNOWLEDGMENTS.—The receipt of statistics, as follows, is acknowledged with thanks: From Anthony Watt, clerk of water-works trustees, statistics and water rates of the water-works of Connersville, Ind. From the Prudential Com-

mittee, statistics and water rates of Attleborough, Mass. From F. R. Persons, Secretary, statistics of the water-works of Elyria, O. From Samuel J. Shea, Superintendent, statistics and water rates of the water-works of Frankfort, Ky.

CORRECTION.—May 20, 1882, p. 158.—*Downingtown.*—Last line, for James B. Sives, read James B. Simes. May 18, p. 156.—*Virginia City.*—There are 11 miles of distribution pipe (not 25) and 2,000 taps.

FRAUDS IN PHILADELPHIA.

PHILADELPHIA, May 22.—The sub-committee of the Water Committee of Councils, appointed about a month ago to investigate the charge that only \$300 worth of brick-work had been performed at the Belmont Water-works, for which services the city was charged \$1,800, met this afternoon. Chairman Bains, of the sub-committee, submitted a report which stated that the committee had appointed measurers who were instructed to investigate certain brick-laying work reported as having been done at the Belmont Works during January, February, March and April of the current year. This committee reported as a result of its measurement that the work for which the city had been charged \$1,843.25 really cost only \$770.64, an excess against the city of \$1,072.61.

As a result of the above investigation and report, the following was submitted to councils on the 23d:

"Whereas, Dr. William H. McFadden, Chief Engineer of the water-works, has by the mismanagement of his department shown a conspicuous want of the ability, care and efficiency requisite to the proper administration thereof; therefore, be it

"Resolved, by the joint committee on water-works, that the said William H. McFadden be and he is hereby respectfully requested to resign his position as Chief Engineer of the water-works."

"I have not been asked to speak," said Dr. McFadden. "I have had no opportunity to defend myself. The workmen desire to be heard. I have no interest in their testimony. When I come before a proper tribunal I will a tale unfold of which gentlemen here little dream. For nine years I have been hounded and abused. Why? Because I have suffered no man to control me; because I broke up the East Park Reservoir ring; because I exposed fraudulent claims against the city, and because I sent Water Department thieves to the Penitentiary. My authority is not commensurate with my responsibility. I must depend upon subordinates, and am not permitted to appoint them myself."

Dr. McFadden is to be heard on Monday next.

LOOKING INTO THE STARR PIPE CONTRACT.

In obedience to a resolution recently passed by Councils, the gas committee yesterday afternoon held its first session to inquire further into the contracts by which the gas trustees in 1879 inflicted upon this city a loss of \$7,610 in the Jesse W. Starr \$46,600 4-in. pipe contract. Walter Wood, of R. D. Wood & Co., produced a letter from Chief Engineer Park, under date of Aug. 20, 1879, inviting proposals for 10,000 12 ft. lengths each of 3 and 4-in. cast-iron pipes, standard weight. In response he bid to furnish the 3-in. pipe, 11 lbs. to the foot, at 15½¢, and the 4-in., 16 lbs., at 22¼¢ cents per foot. Subsequently he saw Mr. Park and James McManes, was told that heavier pipe would be required, and asked to frame a new bid for 3-in. pipe weighing 12½¢, and 4-in. pipe weighing 18 lbs. to the foot. He bid 16 9-10 and 23 9-10 cents respectively per foot. The contract was awarded to Mr. Starr. The clerk read several extracts bearing upon the matter from the record of former investigation. The investigation will be continued.—*Philadelphia Times*, 22d.

ENGINEERS' CLUB OF PHILADELPHIA.

Record of Regular Meeting, April 15, 1882.—President Rudolph Hering in the chair; 24 members and 1 visitor present. Mr. J. J. de Kinder read the first part of his paper upon the construction of dykes, banks, levees, etc., in Holland.

Miscellaneous communications, etc., were presented.

Record of Business Meeting, May 6, 1882.—Mr. D. McN. Stauffer in the chair; 25 members and 3 visitors present.

The memorial to Congress of the American Meteorological Society, asking for the adoption of means by which a common meridian might be established for the reckoning of longitudes and local time, was presented and unanimously approved. The pamphlet from the American Society of Civil Engineers upon standard time for the United States, Canada and Mexico, accompanied by questions to interested persons with regard to the various proportions, was presented and discussed.

The objects set forth in House Bill number H. R.

4726, entitled "A Bill authorizing the President to appoint a commission of experts, skilled in the investigation, production and use of metallic substances and other structural materials, to execute tests and experiments on iron, steel and other materials used in the construction of bridges, buildings and mechanical structures and deduce useful rules therefrom," were unanimously approved and a committee appointed to transmit to our members of Congress the sentiment of the Club upon this subject, and to take such action as might best further the interest in this bill.

The following were declared elected active members of the Club, viz.: I. H. Wingate, Wm. J. Gray, Samuel Rea, Wm. Lorenz, Wm. E. Partridge, Wm. H. Derbyshire, E. M. Seitz, W. W. Coe, D. W. Flickwir, W. C. Wetherill, Washington Jones and W. M. Black.

Mr. Russell Thayer exhibited a section of an underground conduit for electric light, telegraph or telephone wires.

HARTFORD, May 24.—The contract for building the Valley Railroad extension, from this city to Springfield, Mass., has been awarded to Adam Driesbeck & Co., of New York.

GENERAL INTELLIGENCE.

We solicit and are always pleased to publish in these columns any items of interest that may be furnished us.

GAS AND WATER.

SOMETHING FOR THE SCIENTISTS TO INVESTIGATE.—In the town of Riga, this county, the only reliable wells are artesian. There are a large number of these wells in use. From the center of the town north and south, and running back to the west part, these wells range from 70 to 120 ft. deep. In some of them the water rises to the surface, and it is believed that they all strike the same vein of water, the difference in the depth being due to the conformation of the ground. A day before the coming of a northwest wind or a storm from that direction, the water in these wells becomes so muddy as to be entirely unfit for use, and the water has a strong and very disagreeable odor. The only way the farmers obviate this difficulty is to dig a well beside the bored one, tap the pipe below the point to which the water rises, and let it run into the dug well to settle. But all who depend on the water in the bore are afflicted with this changing of its character, which invariably precedes the northeast wind or storm, it acting in the capacity of a barometer, which never fails, but which is exceedingly disagreeable in its operations. The wells subject to these changes are distant about twenty miles from the nearest point on Lake Erie, the whole southern tier of towns in Monroe County having to be crossed to reach the bay. At all other times the water is apparently of excellent quality.—*Adrian (Mich.) Times*.

PHILADELPHIA GAS.—In Common Council chamber President Lex presented a communication transmitted to him by a New York Association, the Hydrogen Company of the United States, through W. W. Harkness, of Philadelphia. The company proposes to lease the Gas Works for twenty years at a five per cent. rental upon a valuation of not less than \$12,000,000, nor more than \$15,000,000. All needed improvements will be made, the city to take the additional works from the company at their cost, or the lessees to have the privilege of purchasing the works at an appraised valuation at the expiration of the lease. The company guarantees that illuminating gas of 17 candle-power, of uniform composition, of density not to exceed .550 and containing not more than ten per cent. of carbonic oxide, shall be delivered to the consumers at \$1.35 per 1,000 cubic feet. Heat gas can be supplied for \$1 per 1,000 feet. General Herman Haupt, who in August, 1879, proposed to furnish gas manufactured by the Beatley & Gill process and apparatus to the city is still one of the company's consulting engineers.

The communication was signed by Robert W. Rutherford, William H. Grenelle and James Pearson Gill, president, general manager and chief engineer of the company.

CIVIL SERVICE IN CAMDEN.—The Water Committee of Camden City Council has displaced all the Republican office-holders in the department and substituted Democrats in their places. The committee, which is mainly composed of Democrats, refrained from making any changes, though strongly urged to do so, until the new engine and boilers had been placed in position.

SURVEY.—Engineer E. C. Davis, of Northampton, Mass., having the question of the water supply of the town in charge, to make a survey of the Turkey Brook route, including the location of the dam reservoir and the water main to Loudville. This brook is on the east side of Turkey Hill in Westhampton, and would give Easthampton nearly a 250-ft. head of water. It would necessitate nearly four miles of main pipes to reach the village, but most of the way the pipes could be laid in a straight line with easy digging and a down grade. A preliminary survey of the same route was made last year by the students under Prof. Sawyer.

WATER-WORKS ASSOCIATION.—The officials of water-works in New England are about to organize an association. Such a society will be of great service in advancing some of the important questions which concern the management of public water supplies, such as waste, etc.

CORSICANA WATER-WORKS.—The City Council has