

Hodgson the Secretary and Treasurer and Samuel A. Muller the General Manager.

CCCCXX—MADISON, IND.

Madison, Indiana, in lat. 38° 46' N., long. 86° 23' W., is on the Ohio River. It was incorporated as a town in 1825 and as a city in 1838.

Water-works were built by the city in 1849, after the plans of Thomas J. Godman and under the direction of Theodore R. Scowden, C. E.

The supply is taken partly from springs and surface water, impounded by a dam across a ravine, the reservoir holding 6,000,000 gallons, and partly from the Ohio River. The water is pumped by a plunger pump of 9½ in. in diameter and 72-in. stroke, into two reservoirs 212 ft. above the river, one of them being 80 ft. in diameter and 20 ft. deep, and the other 73 ft. in diameter and 16 ft. deep.

Distribution is by cast-iron pipe of from 12 to 4-in. diameter, of which 8 miles are in use, with 106 fire hydrants, 100 gates and 600 taps. Service pipes are of wrought iron. The population in 1880 was 9,009. The daily consumption is 400,000 gallons.

The works have cost \$100,000, which is the amount of the bonded debt at 8 per cent. interest. The receipts in 1881 were \$6,000 and the expenses of maintenance \$5,000.

The works are managed by three Trustees elected by popular vote.

Charles E. Godman is the Superintendent and A. C. Pague the Secretary.

CCCCXXI.—ASHLAND, PA.

Ashland, Pennsylvania, in lat. 40° 48' N., long. 76° 18' W., is on Mahanoy Creek, in a mountainous region.

Settled in 1848, it was incorporated as a borough in 1857.

Water-works were built in 1876 by the borough, after plans of Isaac S. Cassin, C. E., taking the supply from Little Mahanoy Creek, a mountain stream which has its source on Broad Mountain, 1,400 ft. above the sea. A stone dam backed with clay, built across the stream 5 miles from the town and 345 ft. above it, forms a reservoir, from which the water is conveyed to the town in a 12-in. cast-iron pipe, 27,400 ft. long, and is distributed by 3 miles of cast-iron pipe of 8 to 3-in. diameter, with 30 fire hydrants, 84 gates and 450 taps.

Service pipes of lead and of wrought iron are used.

The population in 1880 was 6,014. The consumption is not known.

The works have cost \$63,100, and the total receipts have been \$10,483.07. The bonded debt is \$53,000, at 6 and 4 per cent. interest.

The expenses in 1881 were \$1,589.99, and the receipts \$3,840.

The works are managed by three Commissioners elected by the borough Council.

Fred. Rodrian is the Superintendent.

CCCCXXII.—WOOSTER.

Wooster, Ohio, in lat. 40° 46' N., long. 82° 56' W. in a hilly country with numerous valleys and streams, is what is called the "second bottom" lands between Killbuck and Apple creeks. There is a difference of level in two miles over which the city extends, of 290 ft.

Settled in 1809, it was incorporated as a village in 1817 and as a city in 1869.

Water-works were built by the city in 1869 after the plans of Emil Low, C. E., taking the supply from springs yielding 60,000 gallons per day, and the drainage of a water-shed of about 1½ square miles. A dam of puddled earth 300 ft. long and 20 ft. high impounds the water in a reservoir of 1½ acres, averaging 10 ft. deep, and 130 ft. above the lower part of the city.

The supply is insufficient and the quality of the water in summer is bad. An additional supply, by pumping from a stream which passes through the lower part of the town, is in contemplation.

Distribution is by 8½ miles of cast-iron pipe of from 12 to 4-in. diameter, with 88 fire hydrants, 30 gates and 220 taps.

Service pipes are of galvanized iron.

The population in 1880 was 5,933, and the daily consumption 200,000 gallons.

The works have cost \$35,000. There is a bonded debt of \$50,000 at 7 per cent. interest.

The expenses in 1881 were \$400 and the receipts \$1,900.

The works are managed by three Trustees. O. G. Coover is the Secretary, and M. M. Smith the Superintendent.

CCCCXXIII.—ROCHELLE.

Rochelle, Illinois, in lat. 41° 55' N., long. 69° 18' W., is on the Kaite River in a rolling country. Water-works were built in 1877 by the city, after plans by George C. Morgan, taking the supply from springs in an old quarry yielding about 300,000 gallons per day. The reservoir holds about 12,000,000 gallons. The water is pumped directly into the mains by two Worthington duplex engines, the second one erected in 1880. The ordinary pressure is 40 lbs. and the fire pressure 100 lbs.

Distribution is by two miles of 8-in. and 6-in. cast-iron pipe, with 24 fire-hydrants, 4 gates and 40 taps. Service pipes are of wrought iron.

The population in 1880 was 1,896. The consumption is not given.

The works have cost \$19,000. The bonded debt is \$5,000, at 7 per cent. interest. No further financial statements are given.

The works are managed by a committee of the Council. G. F. Northrop is Chairman.

CCCCXXIV.—TUNKHANNOCK.

Tunkhannock, Pennsylvania, in lat. 41° 32' N., long. 75° 57' W., is in a valley two miles long and one mile wide, surrounded by hills, and on the Susquehanna River, at the mouth of Tunkhannock Creek. There is about 40 ft. difference of elevation in the town. Settled in 1780, it was incorporated as a borough in 1844.

Water-works were built by a private company a number of years ago, taking the supply from springs and conducting it through the town by bored logs. The date of construction of these works has not been furnished. In 1870 the works were reconstructed after plans of Harvey Sickler. The water is taken from four springs about 1¼ miles from the town, supplemented in dry seasons by a small mountain stream draining about ½ square mile and fed by springs. The water of this stream is collected in a small box reservoir 150 ft. above the town. Distribution is by four miles of cast-iron pipe, of from 8 to 3 in. diameter, with 10 fire hydrants, 9 gates and 150 taps. The town paid for putting in the hydrants and pays \$5 per year for each one. Service pipes are of wrought iron, lap-welded.

The population supplied is 1,500. The daily consumption is not known.

The capital stock of the company is \$20,000.

The works have cost \$15,000 and the receipts have been \$10,000. There is no debt.

The expenses in 1881 were \$300 and the receipts \$1,400.

In the spring of 1875, after very cold weather, with no snow on the ground, about 5,000 ft. of pipe laid 4 and 5 ft. below the surface froze and burst. Loose, gravelly soil froze deeper than clay. The pipes were relaid from 6 to 12 in. deeper, and covered with coal culm and spent tan bark.

Harvey Sickler is Secretary and Manager of the company.

CCCCXXV.—WARWICK, N. Y.

Warwick, New York, in lat. 41° 15' N., long. 71° 12' W., is in a hilly and rocky country, on Mistucken Creek. Settled in 1719, it was incorporated as a city in 1867.

Water-works were built by the city in 1872, after plans of Charles Caldwell, taking the supply from a small stream, about a mile from the city, and 150 ft. above it, impounded by an earth dam. Distribution is by 4 miles of cement-lined wrought-iron pipe, with 27 fire hydrants and 15 gates. The number of taps is not given. Service pipes are of wrought iron.

The population in 1880 was 1,050. The consumption is not known.

The works have cost \$30,000. The bonded debt is \$11,000, at 5½ per cent. interest.

The expenses are very small, and the receipts in 1880 were \$700.

The works are managed by one Water Commissioner. B. F. Vail is the present incumbent.

CCCCXXVI.—HAMILTON, NEV.

Hamilton, Nevada, in lat. 39° 12' N., long. 115° 39' W., is in mineral-bearing limestone mountains 8,500 ft. above sea level.

Settled in 1867, it was incorporated as a city in 1869 and disincorporated in 1875.

In 1869 water-works were built by the Eberhardt Mining Company after plans of H. W. Von Schmidt, C. E.

The supply is taken from Illapah Springs, three miles east of Hamilton, where the water issues from a fissure in the limestone rock with an average flow of 1,200,000 gallons per day. There is scarcely any rain there and no apparent water-shed. The source is supposed to be in a mountain range 60 miles to the north. At the first pump station, 15 ft. below the spring level, two Cameron steam pumps with steam cylinders 22½ in. and pumps of 10-in. bore and 60-in. stroke, lift the water 500 ft. through a mile of 12-in. riveted wrought-iron pipe with cast-iron hub joints leaded. The pipe is ¼-in. thick for the lower 250 ft., and ½-in. above that. It frequently bursts. The second pumping station with two similar pumps then lifts the water 500 ft. more through similar pipe. The working pressure at each station is 217 lbs. and sometimes by irregular action of the pumps runs up to 250 lbs. To relieve the pipe compressed air is forced into 4 air chambers on the line. The water is delivered into a stone reservoir holding 200,000 gallons on the summit of Momomoke Mountain, 500 ft. above Hamilton, and distributed through 14 miles of 3-in. lap-welded wrought-iron tubing of No. 11 gauge, with cast-iron sleeve couplings and lead joints. This pipe has proved too light for the service, was not well coated with asphalt and has rusted through in wet ground.

There are 20 fire hydrants, 10 gates, 125 taps and 20 meters. While Hamilton was an incorporated city it paid \$1,720 per year for hydrant service. In 1880, after the White Pine mining excitement which created the town had died out, the population was 500 and the daily consumption 10,000 gallons.

From the reservoir a pipe conveys the water two miles across a deep valley and up the side of Treasure Mountain to the reservoir level, where a third pumping station is placed, and the water lifted 700 ft. through 1½ miles of pipe to the summit of Treasure Mountain and Treasure City.

The water pumped now is chiefly used for mining.

The works cost \$380,000. No other financial statements are furnished.

Samuel Liddle is the Engineer and Superintendent.

(TO BE CONTINUED.)

ACKNOWLEDGEMENTS.—The receipt of statistics, as follows, is acknowledged with thanks: From Harvey Sickler, Secretary and Manager, statistics and water rates of the water-works of Tunkhannock, Pa. From Frank Rentz, Town Clerk, statistics and water rates of the water-works of Ashland, Pa. From B. F. Vail, Water Commissioner, statistics and water rates of the water-works of Warwick, N. Y. From G. F. Northrop, Chairman Fire and Water Committee, statistics and water rates of the water-works of Rochelle, Ill. From H. P. Mastin, Superintendent, statistics and water rates of the water-works of Owensboro, Ky. From A. W. Gage, Chairman Water Committee, statistics and water rates of the water-works of Winona, Minn. From Samuel Liddle, Chief Engineer, statistics of the water-works of Hamilton, Nevada. From M. M. Smith, Superintendent, statistics and water rates of the water-works of Wooster, O. From A. C. Pogue, Secretary, statistics and water rates of the water-works of Madison, Ind.

RAILWAY TIE AND BRIDGE TIMBER CULTIVATION.

A St. Louis paper says:

The preservation of railway ties and bridge timbers from the destructive moisture of the soils and climate of the Southwest has long been a troublesome problem among the railway managers. Several works representing large capitals have been established here for the treatment of wood by the creosote and other processes, which increase its durability, but the treatment is quite expensive. Some railway men have concluded that the alantus and catalpa will prove to be the cheapest and most durable wood for tie and bridge timbers. One company, whose road extends chiefly over prairie lands, is having a large plantation seeded for these trees in equal proportions. Both the catalpa and alantus are readily propagated from the seed, and bear seed-pods abundantly. Another company, whose road enters Texas, is arranging to plant several hundred acres of these trees in that State. Even the Iron Mountain Company, who probably own more heavily timbered land than any other in the country, have contracted for the cultivation of a catalpa farm near one of their stations in Missouri. On this road are catalpa ties that were laid nearly fifteen years ago, and are apparently as sound as ever. It is authenticated that in Southern Ohio, where one species of catalpa is indigenous, there are posts and timbers of this wood that have been in ground a full century and yet show no signs of decay. These are hardy trees, and of a very rapid growth. Although the alantus is an importation from China, still it and the catalpa seem to find in climates and soils of Missouri, Arkansas and Texas just what they require to thrive upon. It is now certain that they will for some years, if not permanently, receive extensive attention from the railway managers of the Southwest.

THEY ARE BLESSINGS.

Half the business men visited by newspaper solicitors and asked for advertisements consider the newspaper men as a kind of infliction of Providence, which must take a certain course before being cured. This is error. The newspaper, instead of being a sort of visitation from the lower world, is a public necessity, and for the public good. Instead of dead-beating its way in the world, it thrives upon money hard-earned, and for which it frequently pays, in one way or another, two hundred cents for a dollar. Business men have made fortunes, have risen from poverty opulence, simply from the benefits of the newspapers across the way. The money the newspapers make is handled by the men who patronize with their business advertisements. Some men say, with a sort of pride, "We never advertise. It's too much like throwing money away." Perhaps so, but the man who advertises extensively has the qualities essential to business success. The advertisements placed in papers are like the kindheartedness of youth, bearing fruit at first and reaching into the years when age comes on apace.—Reading (Pa.) News