

23 Great George Street,

Westminster, S.W.

18th February, 1867.

TO THE CHAIRMAN & DIRECTORS OF THE SOUTH STAFFORDSHIRE WATERWORKS
COMPANY.

Gentlemen,

In compliance with your instructions we beg to submit the following Report on the works and water supply of the South Staffordshire Waterworks at the present time.

DISTRICT. By the Company's Act of Incorporation passed in 1853, and by the subsequent Acts of 1857, 1864, and 1866 (the Act of 1866 incorporating the Burton-upon-Trent Waterworks Act 1861) the Company is empowered to supply water to Walsall, Wednesbury, Bloxwich, Brownhills, Pelsall, Rushall, Darlaston, Tipton, Great Bridge, West Bromwich, Oldbury, Smethwick, Handsworth, Dudley, Rowley Regis, Sedgley, Kingswinford, Brierley Hill, The Lye, Halesowen, Tamworth, Sutton Coldfield, and the various Parishes in which these Towns and Places are situated, in the Counties of Stafford, Worcester and Warwick, and also to Burton-upon-Trent, and some Parishes and Places in the County of Derby.

WATER SUPPLY. The Water supplied to this extensive District, comprising upwards of 250 square miles, and a population of more than 400,000 persons, is derived from the Springs that flow into a Tunnel driven through the Red Sandstone of the Permian Measures between the Company's Pumping Engine Shaft, at Sandfield, near Lichfield, and the Bourne Brook, at the point where such Brook crosses the Turnpike Road, between Lichfield and King's Bromley. The length of this Tunnel is about $4\frac{1}{4}$ miles, and the quantity of water derived from it is sufficient to meet the present requirements of the Company. In addition to this supply, (upwards of 4,000,000 gallons daily), the Company is empowered to take water from Bourne Brook, and also from the Lemonsley Mill Stream. The water of the Bourne Brook is connected with the Company's Pumping Shaft by the

Tunnel before referred to, which for a length of upwards of a mile and a half, is lined with Brickwork, and forms a subterranean Reservoir, from which water may be drawn at any time, as required, for the supply of the Engines. By means of this subterranean storage, the water will have a temperature at the Pumping Shaft not exceeding 50°.

The increased supply of water that may be taken from the Bourne Brook, when necessary, exceeds 5,000,000 gallons daily, without the construction of any Reservoir for storage.

The water~~from~~ from the Lemonsley Brook, (described in our Report of the 3rd August, 1863,) will pass into the Company's Storage Reservoir, at Stowe, near Lichfield. The water in this Reservoir will be kept pure by allowing the Stream to flow constantly over the Weir of the Reservoir, while upwards of two Miles of Sewers, constructed by the Company, having their outfall below the Reservoirs, preserve the water in the Streams free from contamination.

The water from the Trunkfield Mill Stream flows wholly through the Sewers of Lichfield, and is not used by the Company as a source of supply.

QUALITY OF THE WATER.

The water supplied from the Sandstone in which the Tunnel is driven is perfectly pure. The Streams which form the Bourne Brook flow from the high ridge of Sand Rock forming Cammock Chase, and are uncontaminated as shewn by the following analysis made by H. Medlock, Esq., F.C.S.:-

<u>BOURNE BROOK WATER.</u>						<u>Grains in Imperial Gallon.</u>
Lime	...	...	...	...	...	3.94
Magnesia	...	...	...	...	...	1.21
Sodium	...	...	...	...	...	0.41
Iron, Alumina, and Phosphates				...	...	A trace.
Sulphuric Acid	...	...	...	...	...	2.76
Chlorine	...	...	...	...	...	0.64

<u>BOURNE BROOK WATER (cont)</u>					<u>Grains in Imperial Gallon.</u>
Carbonic Acid	...	...	...	...	2.89
Silicic Acid	...	...	...	...	0.44
Organic Matter	...	...	...	...	<u>0.82</u>
					13.11
					<u><u>13.11</u></u>

RESERVOIRS.

The Company's Storage Reservoir at Stowe, filled with water from the Lemonsley Brook, as already mentioned, will be used only in case of emergency.

The other Reservoirs belonging to the Company at Cannock Chase, Walsall, Wednesbury, Coneygre, and Dudley, are without any change since our Report already referred to, and are at present sufficient for the distribution of the water for the whole District.

PUMPING ENGINES.

Since our last Report another Pumping Engine, similar in every respect to the two previously supplied by Messrs. Watt & Co., has been erected by that Firm in the Engine House at Lichfield. These Engines, 100 horse power each, are in good condition and perfect working order. They pump water for the supply of the whole District, and are capable of raising 5,000,000 gallons daily. About 50,000,000 gallons are stored in the Reservoirs at Walsall, Coneygre and Dudley, so as to be immediately available in case of any accident happening to the Company's Pumping Main.

The two Engines at Coneygre Reservoir, 50 horse power each, pump the water from that Reservoir to the summit level at Dudley.

The elevations to which the water is pumped by these Engines for the supply of the District, are as follows:-

From the level of the water in the Tunnel at Lichfield.	(To Walsall.	...	230 feet.
	(" Wednesbury.	...	290 "
	(" Dudley Port.	...	190 "
	(" Dudley.	...	390 "

No perceptible loss is occasioned by giving the District constant service at these high pressures. As the Pumping Mains are

connected with the Reservoirs, at a considerable depth below the surface of the water; the pressure is not variable, as it is when the water is pumped over a stand pipe. The high Districts are everywhere supplied at a constant pressure with an invariable quantity.

The chief works which remain to be constructed are:-

An underground Reservoir at Burton-upon-Trent (the most important), to regulate the distribution of water in that Town, and to secure that which is so much required by the Brewers, viz; a supply during the Summer months at an even temperature of 50°.

A length of 10 inch Main to connect the same with the existing Main,

And Extensions of the Service Mains and Pipes in various parts of the Company's District, - but the principal Works are all finished, and there are no disputed claims on Contracts.

As already stated, the supply of water far exceeds the present demand. This has arisen from the large quantities of Water which have been obtained from the Sandstone Rock through which the Tunnel to Bourne Brook has been driven. This supply could not have been calculated on with certainty before the Works were executed, as in some places, and in one place for upwards of a mile in length, the Tunnel is driven in dry ground, - and the Company's Water supply would not have been secure without an extension of the Tunnel to Bourne Brook.

In considering the question of the distribution of this largely increased supply of water, we should state that the Company's Works at Lichfield are constructed at such a level, that a large permanent supply can without difficulty or interference with any existing rights be delivered to the Birmingham Waterworks Company. Nothing however can be done in this matter without a perfect understanding with the Birmingham Waterworks Company, and we think that the time has arrived when the subject may with advantage to

both Companies be discussed, with a view to a general arrangement.

We are, Gentlemen,

Your obedient Servants,

MC CLEAN & STILEMAN.