

**THE HISTORY OF
SOUTH STAFFORDSHIRE WATERWORKS
COMPANY**

1853 - 1989

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CHAPTER 1

1853 - 1864

Organised waterworks for the provision of water to towns and cities were not generally established until the beginning of the nineteenth century. Many of these works were initiated by private groups of individuals as a personal contribution to the welfare of their fellow citizens. These undertakings carried out the work without any reasonable prospect of a return of capital on their initial outlay. Local authorities were not insensible to the advantages of a good water supply but were slow to avail themselves of setting up works, hoping that private individuals and speculators would run the risks of the speculations involved.

During the early part of the nineteenth century, the natural sources of water supply in the industrial area of South Staffordshire, known as the Black Country, had gradually diminished. Because of the density of the population, the absorption of springs by mining operations and the contamination of all surface waters, there were virtually no local means of supply.

A small portion of the district was supplied by two water companies, one at Dudley, the other at Wolverhampton. The first of these companies, established in 1834, afforded only a partial supply to Dudley and Bilston, whilst the Wolverhampton Company, limited its operations to Wolverhampton, taking no steps and showing no inclination to supply the more distant places comprised in the limits of their Act of Incorporation.

With the water supply of the community only partially satisfied by the meagre, impure sources, available from a communal pump or well, cholera and other associated diseases caused the deaths of thousands of the population and there was a dire need for an organised waterworks scheme. This want was endorsed by the evidence at enquiries held before the Commissioner, appointed by the General Board of Health, in the towns of Dudley, Walsall, Tipton, Bilston and Wednesbury. Water supplies, properly organised, gained popularity as a direct result of the sanitary reforms recommended by the General Board of Health. Between 1850 and 1852, three schemes to supply water to the South Staffordshire district were investigated and proposed:

1. The South Staffordshire Mining District Water Company.

This company was promoted in 1851 with the prime object of supplying Wednesbury, intending to obtain water from a source in sandstone rock at Handsworth, Birmingham. This scheme followed on from the Inquiry into Health of Towns of 1845 and the report of T.W. Rammell, Inspector of the Central Board of Health in 1851, who, in his report on Wednesbury stated, "The natural sources of water have mostly failed and been diminished by reason of the mining operations carried on in the parish and neighbourhood. Consequently the inhabitants suffer a want almost amounting to destitution in regard to this important element, having to send, in many instances, a great distance to procure it and at a very considerable expense. The poorer people are generally obliged to use water lying in stagnant pools, filthy and unwholesome in the extreme, for most domestic purposes, being unable to procure a better supply.

The consequence of this scarcity of water is that the dwellings of the poor are unavoidably dirty, and as they are generally small and badly constructed, closely packed together, without drainage of any sort and ill-ventilated, epidemics, endemic and contagious diseases prevail at all times in Wednesbury".

Several wells existed in the town, nearly all were affected by contamination, and these were situated on Little Hill (Bonifaces Well), Church Street (Tackers Well), The Shambles (Market Well), Castle Well at the rear of the Church, Talbot Tavern Well, and Oakes Well in the garden of Oakeswell House.

As news of the South Staffordshire Mining District Waterworks scheme circulated, applications for water were received from other towns including; Tipton, Kingswinford, Bilston, Darlaston, Oldbury, Sedgley, Stourbridge and Rowley, towns equally desperate for water, resulting in the original plans being extended and a search made for a more adequate source of supply to meet the needs of the extended area and the future demands of an increasing population.

The early meetings of the company were held at the George Inn, Wednesbury. A select committee was formed, chaired by Samuel Holden Blackwell, a Dudley ironmaster and mine owner who worked vigorously to improve the conditions of the working classes. Other members were co-originator Thomas Walker of Wednesbury, Joseph Hobbins and John Marshall of Wednesbury, Thomas Spencer of Tipton and E.B. Dimmack and Thomas Rose of Bilston. Henry Marten of Wolverhampton was engaged as Consulting Engineer. Although only twenty-four years of age, Marten possessed considerable ability, having been involved in waterworks schemes at Hull, Wolverhampton and later at Bridgnorth, Wellington and the South Staffordshire Waterworks Company. H. Brown, the first Secretary, was replaced in 1851 by Henry Wright of Great Bridge. Solicitor of the Company was Charles Gallimore Brown, with offices in Bilston, where many of the later meetings took place. Capital of the Company was set at £150,000 in shares of £10 each.

An improved source of supply, to provide for the increased interest, was found at Smestow Brook which rose in meadows between Wolverhampton and Wednesfield and flowed through Wolverhampton, by Gorsebrook to Tettenhall and Compton, where it was joined by the Graisle Brook, then on to Foleys Grounds at Prestwood near Kinver. Marten gauged the stream and found it possessed a volume and current equal to 10,649,000 gallons per day. The engineer proposed to erect works near Greens Forge Flour Mills, from here, water was to be pumped to a reservoir at a high point of Dudley and gravitated to supply the district.

The estimated cost of the works was £150,000 and included an ambitious plan of laying dual mains in the highways and providing a constant supply system. In February 1852, the scheme was submitted to the House of Commons. On the 17th March 1852, the measure passed the ordeal of the Standing Order Committee and received its first reading. Rumours of a dissolution of Parliament at the time caused Blackwell some concern, a possible delay to proceedings would have entailed more expense should the preliminaries have had to be repeated.

The Bill was opposed by the ailing Dudley Waterworks Company and the Kidderminster Carpet Manufacturing Company, the former mainly through spite and the second because they feared that the abstraction of a large supply from the Smestow Brook would interfere with the flow of the River Stour which would ultimately create problems for the staple manufacturing industry in the town. The River Stour at Kidderminster, as it passed under the bridge, was described as having an ink-like appearance caused by the drainage of the carpet works and the practice of washing dyed woollens and carpets in the river.

The second reading of the Bill took place in April 1852 and was expected to be a mere formality but it failed. The Member of Parliament for Kidderminster drummed up support in favour of the townspeople of his constituency in opposing the Bill. It was expressed by Blackwell that the Company expected to make an amalgamation with other interested parties and return with an amended Bill soon.

2. Lichfield scheme.

Another scheme, of 1851, to harness the springs and streams west of Lichfield, promoted by John Robinson McClean, an eminent civil engineer, failed to flourish through lack of support, but was to reappear at a later date following further investigation.

3. Stourbridge, Brierley Hill and Kingswinford Waterworks Company.

Plans were drawn up by civil engineer George Bate who proposed to collect water from several springs in the Clent Hills Range and gravitate it to a proposed reservoir on Hagley Hill, from where it would flow to supply the surrounding area. A meeting was held at the Corn Exchange in Stourbridge on Christmas Day 1850, for the purpose of forming the company. Local Members of Parliament were asked to support the Bill when it was presented in Parliament. Additional meetings were held to canvass support but the advantages of a water scheme were not supported. The scheme was aborted due to local opposition at the source of supply plus a lack of finance.

Merger plans fail.

Dudley Waterworks Company engaged John McClean as consulting engineer in November 1851 and he, through Phillip Williams, owner of Gospel Oak Ironworks, Tipton, requested a meeting with Henry Marten on the possibility of a merger between Dudley Waterworks Company and the South Staffordshire Mining District Water Company, but, because of the difference of opinion on the source of supply, the merger plans failed to materialise.

At a meeting of the South Staffordshire Mining District Water Company in May 1852, Sampson Lloyd of Wednesbury proposed that a meeting should be sought between Dudley Waterworks Company, John McClean and themselves with a view to finding a compromise of all parties to supply the South Staffordshire District. Dudley Waterworks' representatives were unmoved from their choice of a source of supply, the meeting ended without any agreement.

Founding of the South Staffordshire Water Works Company.

John McClean's idea of founding the South Staffordshire Water Works followed discussion in the board room of the South Staffordshire Railway Company of which he was leasee. He persuaded five directors of the railway company to join him in the venture and they became founder directors of the water company; Richard C. Chawner, Richard Dyott, Charles Forster, Richard Greene and Richard Jesson. On 11th December 1852, a meeting of the two South Staffordshire water companies was arranged by Sampson Lloyd, and held at the George Inn, Walsall. Present were Richard Chawner, Capt. R. Dyott, Richard Green, R. Jesson, R. Adams, S.H. Blackwell, John McClean, Henry Marten and Henry Wainwright, a Dudley solicitor. A resolution was passed in which the South Staffordshire Waterworks Company agreed to undertake the repayment of the expenses of the South Staffordshire Mining District Water Company incurred to date, an amount of £2,156.19s.5d. on condition that this company agreed to take 3,000 shares at £10 each in the South Staffordshire Water Works Company, subject to the appropriate Act of Parliament being obtained. As a result E.B. Dimmack, S.H. Blackwell, James Solly, Thomas Walker and Sampson Lloyd were invited to become Directors of the South Staffordshire Waterworks Company on 17th December 1852.

Three months prior to this meeting, in the autumn of 1852, McClean, Marten, Blackwell and H. Wainwright decided to examine the whole of the county between the River Severn, River Trent, River Penk and the streams of Sutton Park in an endeavour to find a suitable source of supply for the South Staffordshire District. Henry Medlock, FCS. the Analytical Chemist of 20, Great Marlborough St., London, the most eminent chemist at that time, was consulted on the qualities of the sources. Eighteen samples, submitted by Henry Marten, were analysed, including water from the River Severn at Bridgnorth, River Tame, River Stour, several brooks and streams in the Lichfield area and the Smestow Valley. Of these, Medlock considered the Severn at Bridgnorth excellent quality and quantity but suspect to future contamination. The River Tame he considered contaminated by sewage matter. Water at Lemonsley Mill and Pones Mill Streams, Pones Mill and Seedy Mill Brooks were all excellent quality but the sources inadequate for a district as large as Staffordshire. He considered the Smestow Brook waters far superior of the samples tested, beautifully clear and bright, free from decaying matter.

McClean and Marten carefully investigated a source of supply in the north of the county, carrying out tests for quantity. Flow rates were gauged on two separate occasions of one week's duration, every hour both night and day, and it was found that the minimum flow recorded exceeded two and a half million gallons per day.

Delighted with this information, Henry Medlock's advice to utilise the Smestow Brook was disregarded and a scheme to utilise the springs and streams in the vicinity of Lichfield was adopted. The Smestow was also excluded from consideration because of the opposition of the mill owners to the South Staffordshire Mining District Water Bill two years previously. The advantages of choosing the Lichfield source was that the Seedy Mill and Pones Mill Streams presented the least interference with the private rights of any in the district.

Pones Mill Stream rose at the foot of a ridge of hills a mile and half west of Lichfield supplied by numerous springs which issued from cracks and fissures in the sandstone rock, denoted as being "as thick as a man's arm in their regular delivery". These springs, described as founding the origin of the Pones Mill Stream, emptied themselves in the first instance with two brooks, Trunkfield and Lemonsley, which united close to Lichfield at their entrance into a pool near Lichfield Cathedral called Minster Pool. This sheet of water acted as a mill pond to a small flour mill belonging to Lichfield Corporation. From the flour mill the water passed to Stowe Pool where there was another flour mill and the water then passed to Pones Mill Pool. Below this point, the stream took up a north easterly course under the Trent Valley Railway. Some water was used for irrigation purposes as it passed the estates of Lord Lichfield, Viscount Anson and others at Curborough Meadows and Alrewas Hayes Meadows, before falling into the Trent near Alrewas.

With the source of supply decided upon, Bourne and Wainwright, solicitors of Dudley, gave notice on the 1st November 1852, that an application was to be made to Parliament for leave to bring in a Bill for making and maintaining a waterworks company. The prospectus was published on 5th January 1853, reading as follows,-

"This Company has been formed for the purposes of affording an abundant supply of pure water to the inhabitants of the city of Lichfield and the important towns of Walsall, Bilston, West Bromwich, Wednesbury, Darlaston, Great Bridge, Dudley, Willenhall, Oldbury, Tipton and Wolverhampton. The population of this district exceeds 200,000 persons, the bulk of whom are actively engaged in mining and manufacturing pursuits.

These facts; the trouble and expense which the poorer classes in Wednesbury, Bilston, Darlaston and other places have been put to in order to obtain an insufficient supply of even impure water, and the injurious effect which has been produced on the sanitary conditions of the people are proved by the reports which during the last three years have been issued by the General Board of Health after inquiries at Bilston, Wolverhampton, Wednesbury and Dudley.

The present Company will provide an adequate remedy for these great evils and the promoters are assured that while improving the sanitary and moral conditions of the inhabitants of this important district, they will reap a liberal return for the money embarked in the undertaking.

The Company itself is based upon a pledge given to Parliament last session by the Dudley Waterworks Company that some comprehensive plan for the better supply of the district should be laid before Parliament in the present session".

At this time, the Company did not propose, except in case of necessity, to become retail distributors of water. Their primary object was to supply water in bulk, leaving the retail distribution to existing water companies and local boards of health who would also have to provide the distribution pipework.

It had been estimated that a daily supply of 2,500,000 gallons would be required but the Company was confident that the works necessary to procure and deliver the water could be provided at a cost of £100,000.

The 1853 Act of Parliament.

In February 1853, the Bill was promoted in Parliament, the Preamble read:-

"Whereas the inhabitants of the city of Lichfield and of the boroughs, parishes and places of Walsall, Wednesbury, Bilston, Darlaston, Willenhall, Sedgley, Tipton, West Bromwich and Rowley Regis in the County of Stafford, and Dudley and Oldbury in the County of Worcester are not at present sufficiently supplied with water for domestic, manufacturing, trading and sanitary purposes it would be of great advantage to the inhabitants of such places if a more ample supply of pure and wholesome water were provided".

Opposition to the 1853 Bill was inevitable on its introduction to Parliament, and was quickly forthcoming. The Corporation of Lichfield on the 4th of March, resolved that Messrs. Dorrington and Company be retained as Parliamentary agents to oppose the Bill, with orders to take all necessary steps for that purpose. The Mayor was authorised to fix the common seal to the petition against the Bill.

Satisfactory terms must have been reached immediately between the parties, on the 2nd of April, 1853, the Corporation resolved," that the draft agreement with the South Staffordshire Waterworks Company, as read, be approved and that the Mayor do sign the engrossment thereof on behalf of the Body Corporate; that the Mayor be and is hereby authorised on the receipt of a duplicate of the agreement, signed by or on behalf of the promoters of the Company and duly stamped, to withdraw the petition lodged by the Body Corporate against the Bill."

Although generally well received throughout the Black Country, the scheme experienced obstacles in many quarters as a result of prejudice, ignorance and the vested interests of certain parties who organised opposition during the Bill's passage through Parliament.

A clear and strong case for the promoters was led by Samuel Holden Blackwell who highlighted the water deficiency and the conditions the population of the district were being subjected to, in order to obtain a glass of water.

Steam water from leaking pipework at mills and forges was collected in tubs to be sold by enginemen at a halfpenny a four gallon bucket. Questioned on the merits of the scheme, Henry Wright of Great Bridge, spoke of ministers speculating in the purchase of large cisterns, strategically placed outside churches and chapels, to collect water off the roofs of buildings, a suggestion which was ultimately accepted by parishioners. In Owen Street, Tipton, publicans were using entirely canal water for the purpose of brewing.

Overall conditions were pathetically inadequate. For several weeks prior to the outbreak of cholera, the water in the canal had been very low; at least eight thousand people in Tipton obtained supplies from this source. It was in the neighbourhood of Brickkiln Street, Wood Street and Cross Street that the cholera raged in its worst form. These places were entirely dependant on canal water. At Toll End the inhabitants continually fetched water from what was called a "swag" the contents of which was contaminated by an open sewer which ran through it.

On the 20th March 1853, the final stages of the Bill had been reached, when proceedings were heard before the Select Committee of the House of Lords. At this stage, strong opposition was being pursued by three parties. Two of these were the Birmingham and Staffordshire Gas and Coke Company and the proprietors of the Birmingham Canal Navigation who feared possible damage to their works. Protective clauses were inserted in the Bill to cover these eventualities and opposition was retracted. The major opposition came from Lord Lichfield, whose case occupied the attention of the House of Lords for three days. He contended that the Company's scheme of constructing a reservoir of 60,000,000 gallons at Pones Mill would seriously affect the irrigation of his land from the reduced flow of Pones Mill Stream. After much deliberation and evidence, both for and against, agreement was reached and compensation paid.

Royal Assent to the South Staffordshire Water Works Bill of 1853 was obtained on 4th August 1853 and powers were given to raise £160,000 in £10 shares with borrowing powers for a further £30,000, of which not more than £6.13s.4d. should be called up in one year. Each shareholder was allowed one vote for every share up to fifty and then one vote for every five up to one hundred. After that amount, there was one vote for each ten shares.

The fifteen founder directors were;-

Arthur Adams of Walsall, a former Mayor.

Thomas Badger of Dudley, an ironmaster and Magistrate.

James Chamberlain Barlow of Bilston.

Samuel Holden Blackwell of Dudley, mine owner and ironmaster.

Richard Croft Chawner of Lichfield, a Magistrate.

Henry Crane of Wolverhampton, Chairman of Wolverhampton Waterworks.

Edward Lowe Cresswell of Tipton, an ironmaster.

Edward Bagnall Dimmack of Bilston.
Richard Dyott of Lichfield.
Charles Forster of Walsall.
Richard Greene of Lichfield.
Richard Jesson of Walsall.
Sampson Lloyd of Wednesbury.
James Solly of Tipton, an ironmaster.
Thomas Walker of Wednesbury, Manager of the Patent Shaft Company.

Bankers were;

The Birmingham Banking Company of Birmingham, Dudley and Walsall.
The Birmingham and Midland Banking Company of Birmingham and Stourbridge.
The Wolverhampton and Staffordshire Banking Company Wolverhampton.

Solicitors to the Company were:

Bourne and Wainwright of Dudley.

Engineers;

McClellan and Stileman of Great George Street, London.
Henry Marten, C.E. Wolverhampton.

Seventy four sections were noted in the Bill and included;-

Directors; the same number was set at fifteen until the first meeting, then the number was to be reduced to nine. The qualifications of a director was that he be the owner of as many shares as represented five hundred pounds of the Capital of the Company.

Meetings; the first ordinary meeting was to be held within three months of the Act gaining the Royal Assent, in either Dudley or Walsall. Thereafter, meetings would be held in Lichfield, Walsall, Dudley, Wolverhampton or Birmingham. The quorum for any general meeting would be not less than seven, present in person or by proxy, holding in aggregate not less than five hundred pounds in the capital of the Company.

Advertisements; the newspaper in which the advertisements relating to the affairs of the Company were to be inserted were to be those circulating in the County of Stafford.

Works; these to be completed in three years.

No supplies were to be afforded to the inhabitants of Lichfield by the Company unless the consent of the Mayor, Alderman and citizens of the city was obtained.

Provision to purchase lands, etc.; this implied that the Company might purchase and the Corporation of Lichfield might sell, such of those buildings, lands, streams and waters required for the works in consideration of a perpetual yearly rent charge.

Dudley; the Company was incorporated to purchase or take on lease the Dudley Waterworks Company, and as soon as the debts of this company had been discharged, the said company was to be wound up.

The mains and pipework of the Company were to be made and manufactured with a distinct mark, stamp or letter, cast or cut on the outside of the pipework, to distinguish them from the apparatus of other companies and presumably gas pipework, or be subject to a fine of twenty shillings for each length of pipe laid unmarked.

For its supply, the Company was authorised to take the water of certain streams west of Lichfield where it was to be impounded or collected in reservoirs, Stowe Pool and Minster Pool, near the city. These pools were to be cleaned out prior to use and Stowe pool was to be enlarged by raising the embankment. In addition a new reservoir was planned at Pones Mill. From here water was to be pumped through a 30 inch main along the London North Western Railway track to Streethay, continuing alongside the South Staffordshire Railway track to a small circular reservoir planned at Barrow Cop. From this receptacle water would gravitate via the railway track to a ninety foot deep pumping shaft at Sandfields. The Lichfield waters were then to be pumped up to a reservoir it was proposed to be built at Moat Hill, Walsall, from where it would flow by gravitation to subsidiary reservoirs near Wednesbury and Dudley. It was proposed to lay this main alongside the South Staffordshire Railway track. Principal object in so laying the main was to obtain the support of the mines, purchased by the railway company for the support of the railway track and because it formed the shortest route between Lichfield and Dudley. The cost of maintenance was also considered, as in this mining district, inspection was always required and the platelayers of the railway company would check that none of the water pipes were injured by mining operations.

With a shortage of funds, the Founder Directors, Engineers and Solicitor were each asked to contribute £100 towards the Parliamentary expenses.

Early meetings and publicity.

The First Ordinary General Meeting was held at the George Hotel, Walsall, on Tuesday 1st November 1853. Richard Chandler Chawner was unanimously elected the first Chairman and called to the chair. Henry Wainwright acted as Secretary and read the advertisement convening the meeting.

The seal of the Company was then affixed to the register of Proprietors.

The report of the Directors was then presented and read, and a copy of the Company's Act of Incorporation laid on the table. It was then proposed Richard Chawner seconded Charles Forster, M.P. that the report of the Directors read at the meeting be adopted, printed and circulated among the Shareholders. This proposal was carried unanimously.

It was then proposed by the Reverend Dr. Browne, seconded Richard Smith that Richard Croft Chawner, Samuel Holden Blackwell, Edward Lowe Cresswell, Edward Bagnall Dimmack, Richard Greene, Richard Jesson, Sampson Lloyd, Thomas Walker and Harvey Wyatt, be elected Directors of the Company in the place of the fifteen Directors named in the Company's Act of Incorporation who retired from office at this meeting. Newcomer to the Board, Harvey Wyatt resided at Acton Hill, Stafford.

Messrs. Josiah Cresswell and George Taylor were elected Auditors of the Company.

The Director's report read to the meeting stated; With regard to the successful result of their recent application to Parliament and the establishment of the Company on a permanent basis, the Directors congratulated the shareholders.

The report then went on to refer to the agreements which had been entered into by the Company in the course of Parliamentary proceedings, with the Corporation of Lichfield, the Earl of Lichfield, Lord Bradford, the London North Western and the South Staffordshire Railway Companies and the Dudley Waterworks Company, and further stated that the Directors had ratified a previous agreement with Mr. Sultzer of Pones Mill, thereby ensuring an ample supply of water. Applications had been received by the Directors from the authorities of Wednesbury, Bilston, Wolverhampton and a part of the district west of Dudley on the subject. As the Directors, however, only held office until the first general meeting of the Company, they had deferred the consideration of these questions, believing that the permanent authority of their successors, who would remain in office until the completion of the works, would enable them more effectually to conclude questions of so much importance, and for the same reason, the Directors had abstained from giving direction for the prosecution of any works.

In the progress of the Bill through Parliament, it became necessary to provide Capital to purchase the works of the Dudley Company, if required by that Company, under the provisions of the before mentioned agreement, and also meet the objection of the Chairman of the Committees of the House of Lords to the grant of extensive powers of borrowing money. The share capital was therefore increased from £120,000 to £160,000, to be raised in 16,000 shares of £10 each, and at the same time powers were given to borrow to the extent of £30,000, but this power could only be exercised after the whole of the capital had been subscribed for, and one half of it had been paid out. The powers of the Dudley Company to compel the South Staffordshire Waterworks Company to purchase their works having ceased, the additional capital provided would not be required for that purpose, and it would be available for the extension of works within their Parliamentary district of this Company.

The practical effort of these alterations, however was that the works must be carried out in the first instance, to a great extent, by means of share capital, and the Directors recommended that a further issue of shares at once took place, and at the same time be offered to the public.

The Act granted, the promoters made a further call on shares to enable work to commence. Leading persons in the towns to be supplied, including Lord Bradford, Lord Hatherton, Lady Emily Foley and Lord Ward, were requested to show their influence by supporting the scheme.

Lord Ward wrote to the Company to say that by way of assisting in so good a work he was prepared to take five hundred shares instead of the one hundred he held, doing so in the hope that others, who knew the district and its wants even better than he did, would be induced to lend their immediate help. At a later date, Mr R. Smith, Lord Ward's agent, wrote to the Henry Wainwright in respect of an interest claim on his Lordships overdue call on his shares, the solicitor replied that the Directors could not waive the claim for payment of interest, it having to be paid by all shareholders whose calls were in arrears.

In February 1855 a meeting was convened of persons in Walsall, interested in the promotion of the Company.

The proceedings, held at the George Hotel, with Richard Jesson presiding, were for the purpose of organising a committee to assist the Secretary, Josiah Churchill, in canvassing the town for subscribers to the many unallotted shares, and to hear a statement from Jesson as to the position and prospects of the Company. The statement gave general satisfaction and several influential local gentlemen volunteered to assist in making a local canvass of the town and neighbourhood, from which the best results were to be expected.

A large advertising campaign was staged, to draw attention to the meetings which were to be held in towns in the proposed area of supply. These promotion meetings followed a more or less similar format. Typical of these was the meeting held at the Guildhall, Walsall. In attendance were Charles Forster, Member of Parliament for Walsall, R.C. Chawner, Henry Marten, H. Wainwright, S.H. Blackwell and many of Walsall's local dignitaries including, W. Roper, J. Boys, J.W. Newman, C. Greatrex and H. Fletcher. Richard Chawner proceeded to outline the powers of the Company, the means of supplying the district and the source of supply from which the water was to be obtained. He explained that the deputations were visiting towns for the purpose of providing explanations to the many questions, as people were unaware of the objects and powers of the Acts of Parliament and that shares were available. They would also explain that, had the Company received more support, the works would now be in operation. Chawner concluded by inviting the inhabitants of Walsall who, it had been said, were fond of local government, to take up shares so that the Company could proceed with work.

Limited support was forthcoming, by March 1855, 8,981 shares had been allotted and numerous promises to purchase shares had been made.

Arthur Adams, a merchant of Walsall, was the holder of the first shares of the Company, numbers 1 to 100, followed by John Chamberlain Barlow of Bilston, holding 50 shares. The major shareholders at this time were Samuel Holden Blackwell, Alexander Cochrane and John Robinson McClean, each purchasing 500 shares.

Only half the shares had been allotted by April 1855 and it was debated whether to abandon the project. Shareholders were of the opinion that the public was losing faith in the Company starting the works.

Tenders for the works.

In the hope that signs of work starting would induce a further inflow of funds, Engineers McClean, Stileman and Marten produced the plans of the works in March 1855 and a decision to advertise for tenders on the three contracts was made the following month,

South Staffordshire Water Works Company

To Contractors and Ironfounders

The Directors are prepared to receive Tenders for the Construction of the following Works;-

Contract No.1- For a Reservoir, Heading and Wells at Lichfield.

Contract No.2- For a Reservoir at the Moat Hill, near Walsall.

Contract No.3- For providing and laying down about 6,500 tons of cast iron main pipe.

Plans, specifications, and quantities, may be seen at the offices of Mr. Henry Marten, Market Street, Wolverhampton, on or after the 17th instant; and at the offices of Messrs. McClean & Stileman, Great George Street, Westminster, on or after the 24th instant. Tenders, addressed to the secretary as below, must be sent in on or before the 31st day of March.

By order.

Josiah Churchill.

Secretary.

Darlington Street, Wolverhampton.

March 6, 1855

These contracts were let in May.

No. 1 contract, comprising the construction of a reservoir, headings and wells at Lichfield, was started in December 1855 by W. Welton of London. After being beset with problems of hard rock, disposal of surface water encountered whilst excavating the aqueduct, and the contractor failing to conduct the works in accordance with the provisions of his contract, the Company was compelled to take possession of the land. The Board approved the tender of John Boys and Company Ltd. of Walsall for completion of contract number one conditionally on his executing the contract as the Company's solicitor shall require.

The contractors stock and plant stood as security for the due performance of the contract. In case of non performance the stock and plant was to become the absolute property of the Company. Immediately the contract commenced, Boys erected a powerful steam engine and five smaller engines, for the purpose of reducing the level of water in the sandstone, whilst driving the tunnel conduit between Minster Pool and Sandfields.

Minster Pool was cleaned out after diverting the stream which ran into it. Hundreds of tons of silt and other debris were removed from the pool and it was disposed of, by offering it to local farmers who carted it away from the site to their fields. As the carts passed through Lichfield's streets much of the wet contents were discharged onto the thoroughfares, greatly to the annoyance of the inhabitants. Cannon balls and mortar shells were amongst the relics uncovered during the cleaning out operation.

No. 2 contract for the reservoir at Moat Hill, Walsall, was let to John Boys of Walsall, but no work could be carried out because of difficulty experienced in gaining possession of the site.

No. 3 contract, for providing and laying 6,500 tons of 22 inch cast iron main alongside the South Staffordshire Railway line between Lichfield and Walsall, was given to Messrs. Cochrane and Company of Harts Hill, Dudley. The pipework was made by the Dudley company who sublet the mainlaying to John Aird and Sons of London and work was carried out without any interruption to the traffic of the railway.

Proposed alteration to plans and Lichfield's opposition.

Funding the works was proving an embarrassment. John McClean in an effort to cut costs redesigned the scheme, submitting a letter and tracings of his new proposals to Lichfield Corporation in June 1855.

On 5th of June 1855, a meeting of the Lichfield Council, acting as Commissioners under the Local Acts, was held in the Guildhall. The Mayor opened the business of the meeting by reading the following letter from John McClean;-

Westminster

Dear Sir,

I send you a tracing, showing the proposed works at Lichfield, also a tracing of the section of the tunnel, shewing the depth below St. John Street, and the depth at which, in my opinion, the wells will remain permanent after the completion of the works, etc.

Truly yours,

J.R. McCLEAN.

The production of the letter and the tracings led to a lengthy debate. The tracings exhibited the contemplated design of Stowe Pool level about five feet above the present level and of conveying the water through a tunnel, at one end about twenty feet and at the other end about fifty feet, below St John Street to a well near the railway station. Considerable alarm was shown by Members of the Council when the proposals were considered, fearing that all the wells of the City would become drained with the construction of a tunnel. Circulating at this time was news that the Company intended to seek compulsory powers to acquire lands, buildings, streams and waters with which to carry out the works, thereby amending section 23 of the 1853 Act which used the term, "may acquire".

After some discussion on the subject a proposal was made and carried unanimously;

"That the Commissioners think the proposed tunnel through the streets of Lichfield likely to be injurious to some of the inhabitants, and that, owing to its being without Parliamentary sanction, the persons injured will not be able to recover the compensation they would be entitled to, without incurring heavy legal expense, and they therefore, withhold their sanction from the scheme in its present form."

In an effort to allay fears John McClean suggested that the Lichfield Commissioners appoint an eminent person to examine and report, at the waterworks expense, on the effect these proposals and operations, by the Company, would have on the City's supply if carried to a conclusion, neither party to be bound by the report. James Simpson, President of the Institute of Civil Engineers and Engineer to the Chelsea Waterworks Company was appointed to carry out the inspection and to report and advise the parties. Some of the Commissioners favoured the appointment of a geologist, Professor Ansted to advise them, but Simpson was selected by eight votes to six.

In August the report was published. Simpson was of the opinion that the works could be carried out without prejudicial effect of the supply to the city.

He recommended the adoption of a certain plan, which he said, would place the matter beyond any doubt, and added that the Company should enter into guarantees to protect the interests of the city, and that an engineer should be appointed, at the expense of the Company, to approve, on behalf of the Council, of the works they executed. He recommended that the tunnel or conduit and the shafts required for the construction of it, should be lined with nine inch brickwork, built in cement and made watertight. His other recommendation was that the site for the proposed pumping station should be sited at Sandfields, east of, and near to the bonehouse, other sites had been mentioned but these he had disregarded.

In October 1855, Chairman Richard Chawner, stated that progress had been made with the Earl of Lichfield respecting his land below Pones Mill, and negotiations were proceeding between the Company and Lord Bradford for land required at Walsall for a reservoir.

Lichfield Corporation agreed to rent Stowe Mill, Stowe Pool, Minster Mill, Minster Pool and all water courses at a perpetual rent of £365.12s.0d. per annum.

The amount to be paid quarterly through George Ashmall, Lichfield Corporation Treasurer, 20, Bow Street, Lichfield. These charges were based on the valuation of Joseph Naden a district valuer and were;

1, Two mills, pools, outbuildings and Union Mill Garden. 10 acres, 0 rods, 12, perches; rent charge £260; in fee £6,500.

2, Meadows, etc., 8, acres, 3, rods, 3, perches; rent charge, £88; in fee £2,200;

3, Compensation for moveable chattels and all other appurtenances belonging to the mills, water, and premises, in fee £100.

The whole rent charge was to commence from the day the Company take possession of any part of the premises. Another small piece of land at a rent charge of £17.12s. was offered to, and taken by the Company. A delay occurred in obtaining the consent of the Lords of the Treasury to the agreement.

The conveyance of the pools was not signed until 1872. It stated the terms of withdrawal of the Corporation opposition and included the granting of the rent charge of £365 12 shillings per annum as the consideration of the purchase of the Minster and Stowe Pools. This sum had been paid up to that time. As recited in the conveyance, these pools were at the date of the agreement, in lease to Dunn and Ready. These leases were, in 1856, assigned by the lessees and the Corporation to the South Staffordshire Water Works Company, giving a delay in taking the conveyance of the fee simple.

South Staffordshire Railway Company's charge for use of the railway line between Lichfield and Dudley, sixteen and a half miles, was fixed at £10 per mile per annum.

Digging the first sod.

In a bid to promote good publicity, the Board of Directors requested the Earl of Dudley to inaugurate the works by digging the first sod. Due to the financial situation, John McClean suggested that each of the directors, engineers and the solicitor contribute £10 towards the expenses of the ceremony and promised to provide a special train at no charge to convey the guests from Dudley and the surrounding districts to Lichfield.

Friday the 22nd February 1856 was the day appointed for the inauguration ceremony. It was arranged for a special train to leave the South Staffordshire Railway Station, Dudley, to convey Lord Ward and one hundred and fifty guests to Lichfield.

On a bitterly cold day, his Lordship kept the passengers and the train waiting for half an hour, much to everyone's annoyance.

The train, decorated with flags and bunting, departed at twelve thirty hours making stops at Dudley Port, Wednesbury and Walsall and arriving at Lichfield at 1.30 p.m. when the party was joined by the Earl of Lichfield, Lord Waterpark and Lord Alfred Paget. Following the walk to the Guildhall, the procession, headed by Syners Band, was joined by the former Mayor, (W.H. Hewitt), the Town Clerk, (C. Simpson), members of Lichfield Corporation and Beadles carrying maces and insignia at the Guildhall, and by Lord Hatherton, the Lord Lieutenant of the County at the ground. All assembled, the party then proceeded to the reservoir site, a field situated between Stowe Pool and Lichfield Cathedral. The conveyance of the land had not been completed in time for the ceremony, due to a technicality, and in order for the proceedings to go ahead, the Company paid a fee for it's use.

Flags marked out the ground where a rough, low wooden platform had been erected, and nearby a canvas marquee and pavilion had been set up. Placed on the platform were a wheelbarrow and spade, the former made of mahogany with a brass edged wheel was supplied by Wolverhampton builder J. Elliot. The mahogany handled spade, made by Linden of Birmingham, had a blade formed like a shield, inscribed with the Company seal and worded, " This spade was used by the Right Honourable Lord Ward in turning the first sod of the South Staffordshire Waterworks at Lichfield, February 22nd 1856". Also listed on the spade were the directors, engineers and secretary's names.

Preparations for the event being completed, Lord Ward, attended by Josiah Churchill the Company Secretary, took up position on the platform in readiness to turn the first sod. Taking up the spade, he lifted up a quantity of earth and placed it in the wheelbarrow which was then pushed over the platform, depositing the soil to the ground, amidst the cheering of hundreds of spectators.

Lord Ward then addressed the crowd;

"Gentlemen of the County of Stafford and inhabitants of the district generally, I cannot help thinking that this is a great day in the annals of the City of Lichfield, a great day because the work we are met to inaugurate is to administer to one of the most essential of all wants in the cause of every day existence, the supply of water. In these days all who have anything like leisure, all those who have the means at their disposal are, and more than ever has been the case in England's history, disposed to turn their attention to the well being of the community at large, but be assured of this, that great as our efforts may be and anxious as we all are".

Here the platform gave way, depositing Lord Ward and some of the immense crowd upon it on to the ground. Fortunately the platform was only raised off the ground eighteen inches, and no one was hurt. After a general laugh, Lord Ward said jocularly,

"There's one comfort about this, we are at the bottom of it".

His Lordship proceeded.

"I could tell a long tale and a sad one of the amount of suffering which is thereby entailed. I could tell you that it is come positively to this, that in some towns of the South Staffordshire district, whose great wealth you hear of every day, that from the necessity of keeping mines free from water, not families alone, but whole districts are glad to get what waste water filters away from the canals through the impurities of their banks. I know that in some of these towns, this want of water, produces fever which never ceases from among the poor, and if we include the accidents that occur in a large district like that, we find that these causes reduce in the aggregate the average duration of human life in particular places to below twenty years. That is to say, taking the average, no one lives to see a twentieth birthday. If we can do anything to extend that limit of life, it is not only our duty to do it, but we must derive the highest conscientious pleasure from being instrumental in doing so. Many of you have, I dare say, read in the local prints what it is actually proposed to do from this day to meet this want of water, but the amount of supply that is necessitated by the actual requirements of the district to which I have alluded, will be gathered from this simple fact, that the green turf on which we stand is quickly to be turned into a large reservoir, the contents of which will be the almost incredible quantity of sixty million gallons of water. Think of that being sent through large mains to the South Staffordshire district and fairly divided between house and house at an expense of not much beyond seven shillings a year, if that much, where now in ordinary times a common bucket of water, after having suffered carriage, and thereby acquired impurity, is charged one penny, and, when demand increases, even that price is doubled".

After his praise for the officials of Lichfield he concluded,

"For myself I can safely say that I never took part in a more gratifying proceeding, for I think in these days for one thing we have to look to more especially is this, to see that every work to which we lend our hand has a good practical, sensible, straightforward, and easily obtainable object in view; and that that end should be so obtained, that, if possible, actually in the generation of which we form a part, we may see the good work not only begun but ended, and that we may feel at last that, during the years allotted to us we have not lived in vain".

Richard Chawner said that as Chairman of the Company whose undertaking was that day inaugurated, he would trespass on their attention to echo the hope of the noble Lord who had preceded him, that they were from that day going to have a change in Lichfield, and that they were going to turn over a new leaf in its history.

The procession was then reformed and proceeded by Stowe Pool through the city to the George Hotel, where a hundred and thirty guests sat down to dinner followed by many speeches praising the Works and Engineer John Robinson McClean.

Lord Hatherton said *" I have no doubt but that, under the able guidance of Mr. McClean the water's about Lichfield would be so conducted into the Black Country, that they would be drunk by the inhabitants there as fresh as by the boy who lay on his face and drank them at the spring".*

P. Williams Esq., said he had lived in the smoke of the Black Country all his life, and had attained to a tolerable growth, but he was sure that if they of the Black Country could have some of the pure water of Lichfield to refresh their inner man and sparkle in their veins, they would grow still more.

Captain Dyott proposed a toast to the "Chairman and Directors of the Company, "alluding to their exertions during the past six months as proofs of their ability and guarantees for the prosperity of the scheme. After three cheers for the indefatigable Secretary of the Company, Mr. J. Churchill, the company broke up shortly before seven o'clock, and returned to their several destinations by the special train on the South Staffordshire Railway.

Opposition to the 1857 Amendment Act.

Following the ceremony, work started in earnest but it became obvious that under the terms of the 1853 Act, to complete the Works in three years, could not be complied with so the Company was forced to consider obtaining an Amendment Act, an application was submitted to Parliament on the 13th of November and amongst the proposals was a plan to fill in Minster Pool and create a public garden.

The plans to construct a reservoir at Pones Mill, the aqueduct alongside the railway track and the reservoir at Barrow Cop were abandoned. The new plans allowed for the enlarging of Stowe Pool and its two sources of supply were to be encased in a nine inch thick brick tunnel where they ran through Lichfield. Water was to be gravitated from Stowe Pool, in an adit tunnelled through the city, under Dam Street and Bird Street, across Beacon Park to Townfields, finally discharging into a pilot well at Sandfields.

Many of Lichfield's inhabitants considered the South Staffordshire Water Works Company scheme as detrimental to the city and voiced their opinions in the Staffordshire Advertiser.

One letter of November 22nd 1856 read;

Sir,

I allude to the South Staffordshire Water Works Company and I ask, in reference to it, are the good people of Lichfield fast asleep or are they so sweet tempered and easy in their circumstances that they will quietly allow, if not actually the bread, at any rate the water, to be taken out of their mouths and given to strangers.

They have seen their two beautiful pools, the ornaments of their city drained and left in the hottest months of the year in the condition of reeking mud, clothing itself with a rank and noxious vegetation. They have endured that their streets should be obstructed with wooden panellings, their pavements broken up and foot passengers turned into the mud of the middle of the street, pits sunk in the main thoroughfare, wells part drained and this without any power from Parliament authorising it.

The good citizens of Lichfield must be deeply absorbed in business, if I could offer advice on the subject it would be that they should give business one day's holiday and assemble in general conclave for the purpose of resisting to the utmost of their ability, the encroachments of the South Staffordshire Waterworks Company.

General opinion on the subject resulted in a public meeting followed by Council Meetings in Lichfield, to discuss the merits of the South Staffordshire Water Works Company's proposals in a new application to Parliament for a deviation to the original Act, namely; to enlarge Stowe Pool, make an aqueduct from Stowe Pool to a pit shaft at Sandfields, to compulsory purchase Leamondsley Mill with the lands, pools and water rights attached, to authorise the Company and the Feoffees of the Conduit Lands to agree for the transfer of the Company of the streams, springs and waters belonging to the Feoffees, to authorise the Company to supply Lichfield and finally for powers to fill in Minster Pool and make a place of recreation for the public.

A deputation consisting of Richard Chawner and John McClean attended a special meeting of the Town Council for the purpose of taking into consideration certain alterations proposed to be made by the Company in carrying out their works in Lichfield and the neighbourhood.

These alterations related principally to taking the tunnel for the conveyance of the water through the Swan Moggs and Bowling Green Fields instead of under Bird Street and John Street and the proposal to fill in Minster Pool. For the former alteration, the Company was applying for compulsory powers in the new Act, but the latter they were hoping to effect by agreement with the town authorities.

John McClean explained that the level of the proposed tunnel would not be different from the one intended to have been taken through the streets of the town. The diversion, it was explained, had been rendered necessary through the sewage matter getting into the tunnel, and it was desirable to be free altogether on any suspicion on that head; and it was also thought that the new course would be more convenient to the inhabitants, as the streets would not be broken up for a long time together. With regards to Minster Pool it was explained that if it were left a pool they could not prevent the surface drainage from the Close running into it, and being open it would be exposed to dead dogs and other impurities being thrown there. Certain resolutions were made and subsequently passed on to the South Staffordshire Water Works Company.

Henry Wainwright the Company's Solicitor in his reply stated that the resolutions had been considered by the Directors of the Company and he was authorised to say;

1st That no alteration is intended to be made to the level of Stowe Pool as fixed by the minutes of the Corporation.

2nd That no alteration will be made in the level of the aqueduct between Sandfields and Stowe Pool, without the consent of the Corporation.

3rd That the protective clauses contained in the original Act in reference to the rights of the Corporation are re-enacted.

4th That if any permanent injury be done by the Company's works to the springs under the control of the Feoffees of the Conduit Lands, the Company will engage to provide twenty five gallons of water per head per day as proposed, for distribution to the inhabitants by the Corporation or Feoffees. If the Company should be called upon to fulfil this stipulation the existing water rights of the parties were to become vested in them. Minster Pool would remain intact and the Company would bind themselves by clauses to be inserted in the new Bill to carry out and observe these proposals, to induce Lichfield to wave the opposition which they threatened to the Company's project.

As further Acts of Parliament were from time to time obtained by the Company, necessary provisions for the protection of the rights and privileges of the City were inserted in each Act that affected the City.

The actual area of the Lichfield Pools was given as 20 acres, 2 roods, 3 poles, various portions of land were purchased in order to enlarge the pools. Stowe Pool was dredged, and embanked, the shallower Minster Pool was cleaned out. At the completion of the work, Minster Pool contained 2 million gallons and Stowe Pool 50 million gallons of water. A thirty inch cast iron main conveyed water from the Leamonsley Brook along the bed of Minster Pool into Stowe Pool. In times of a water shortage a system of valves enabled water to be discharged from Stowe Pool into another pipe leading to a well shaft situated in the area called Swan Moggs, before entering the aqueduct to Sandfields. Stowe Pool would then fill by the natural supplies of Leamonsley Brook, reaching it via an overflow weir sited at one end of Minster Pool. Swan Moggs, originally a swamp, was infilled with the surplus soil excavated from the tunnel and its associated well shafts, at the time of their construction. The Swan Moggs was later laid out as a public garden and renamed Museum Gardens. The bottom water level of Minster Pool was 259.58 and the top level, 262.58, Stowe Pool figures were, bottom water level 240.21 and the top level 260.11.

Petitions against the 1857 Amendment Act were presented by the City of Lichfield, the Wolverhampton Waterworks Company, who disputed the right of the South Staffordshire Waterworks Company to supply Bilston, and the London and North Western and the Great Western Railway Companies, who demanded protective clauses in the Bill.

Despite the opposition, the Bill passed the Committee of the House of Lords, chaired by the Duke of Norfolk, in July 1857. The Wolverhampton New Waterworks Company opposed the Bill when in Committee of the House of Commons, but it was decided they had no locus standi and therefore could not be heard on their petition. The opposition was resumed before the Lords, who also refused to hear them on their petition, seeing they had no reasonable ground of opposition.

The Amendment Act of 1857 received the Royal Assent on 10th August. It enabled the Company to extend its works and obtain an additional supply of water.

First and foremost, it extended the completion of works date to 1862 and certain deviations to the original Parliamentary plans were also allowed. Parliamentary powers were also obtained to take water from Bourne Brook, three miles from the other source, and for that purpose to construct a reservoir at Seedy Mill.

One other power obtained under the 1857 Act was authority to supply Smethwick. The Bill had been opposed by the Smethwick Local Board claimed that an adequate supply of good quality water was available from streams flowing throughout the district. It was also hopeful of obtaining a supply from Birmingham Waterworks Company whose charges were lower than the tariff proposed by South Staffordshire. When a clause was inserted in the Bill making the South Staffordshire Waterworks Company's powers to supply Smethwick dependent on requests from the Local Board, the opposition was withdrawn.

Three years later the truth about the quality of Smethwick's own water supply was debated. A public lecture was given at the Independent Old Chapel, by F. Wrightson, Professor of Chemistry at Birmingham. The talk was at the invitation of the committee of Smethwick Library and Institute, on the subject of "Water". The constituent of the pure element was first explained, and the different qualities and impurities in water were afterwards pointed out. To illustrate the lecture, experiments were carried out. An analysis of the local supply was made and exhibited which would warrant a public outcry for water for domestic purposes in the hamlet, to be purer in its composition, and uncontaminated with the organic abominations which, upon evaporation, were found suspended in the well water. It was a matter of surprise that so few persons felt sufficient interest in the subject to be present. Where for instance were all the teetotallers.

Letting of contracts.

Following the satisfactory conclusion of the 1857 Amendment Act, attention was now turned towards the construction of the works. Twelve Companies submitted tenders for the number four contract to supply and erect the steam engines at Sandfields of which three companies were asked to reconsider their tenders, James Watt & Company, W. Perry & Company and J.& G. Davies and Company.

James Watt & Company of Soho, Birmingham, prior to being awarded the contract were asked if they were disposed to accepting shares in the South Staffordshire Water Works Company. In declining the share offer, they offered liberal arrangements for payment of engines. No payment was required until completion of the contract, when half payment was required with the remainder payable eighteen months later.

The plant at Lichfield consisted of a battery of four Lancashire boilers supplying steam to the rotative beam engines constructed at their Soho Works in Birmingham. These blowing engines were reputed to have been originally designed for use on the ill fated South Devon Atmospheric Railway. This method of railway operation not proving a success so the apparatus was modified for use as water pumping engines. The plant at the station was known locally as the "Big Shaft".

The following is a copy of the order from South Staffordshire Waterworks Company sent to James Watt and Company for the Lichfield engines, although the description is refuted by steam engine experts

APRIL 20th 1860

To 2 Pumping Engines of the high pressure expansion condensing construction having cylinders of 46 inches diameter and 8 foot stroke and double acting pumps of 18 inches diameter and 8 feet stroke together with 4 boilers and their complete apparatus, including duplicates and tools as per specification and contract, the whole delivered and erected at Lichfield. £10,750.

To a steam case to each of the cylinders according to estimate accepted by Mr. McCleans letter of 27th April 1857. £130

To an air force pump with plunger rod and delivery pipes to air vessel of each engine to estimates accepted by Mr. McCleans letter of the 27th April 1857. £1,160.

Eleven years later, Sampson Lloyd the Company's Chairman wrote to James Watt & Company requesting information on the engines, the letter was answered by Gilbert Hamilton who stated, "The engines for your works at Lichfield were designed to be three in number, having cylinders of 46 inches diameter and eight feet stroke to raise two and a half million gallons in twelve hours to a height of 415 feet including friction. To do this work at a speed of twelve strokes a minute would have thrown too heavy a load on the piston for the perfect working of the engines, as regards the required economy of fuel. It was therefore determined to reduce the diameter of the pumps to eighteen inches and increase the working speed of the engines to thirteen and a half strokes at which they would do well."

Walsall Reservoir.

Delay was experienced in starting the thirty three million gallon reservoir at Moat Hill, Walsall, due to legal difficulties in obtaining the site, at that time a ploughed field. The ceremony of cutting the first sod, was performed by Chairman Richard Chawner on 12th November 1856. At one o'clock a procession formed at Walsall Railway Station and accompanied by a band playing "Annie Laurie", the party made their way to the proposed "field of action".

Richard Chawner was presented with a shining spade with which he performed the start of works. In addressing the assembly he stated that they had been called together that day for the purpose of delivering into the hands of J. Boys and Sons, the land on which to carry out the work entrusted to him, increasing the number of men employed in carrying out the Company's works. Two hundred men were employed on the works in Lichfield, all of them being contract labour.

Also present at the ceremony were H. Wainwright, J. James, R. Jesson, the Mayor of Walsall, W. Thomas, and Ex Mayor F. B. Oerton who good humouredly remarked the ill tempered pump maker would soon be out of business.

The ceremony completed, the bells of St Matthew's Church rang out and a sheep was roasted on site for the workmen, whilst the gentry retired to the George Inn. Work on site commenced next day, the elliptical shaped, open reservoir was formed by earth embankments with a three foot lining of clay and slag pitching on the slopes.

This was later to prove a haven for bacterial growth and water insects. On completion in December 1857, Moat Reservoir acted as a balancing receptacle being fed from Lichfield and supplying the lower parts of Walsall. The cost of the nine acre site, purchased from the Earl of Powis, was £3,008.

Opening of the works.

Directors, shareholders and invited guests assembled at Station Street, Walsall on Tuesday 26th October 1858 to witness and participate in the opening of the South Staffordshire Waterworks. A specially decorated train consisting of seventeen first class coaches, transported the party from the Lichfield area to Walsall. Among the distinguished guests were Lord Hatherton, Lord Alfred Paget MP, Lord Ward, the Bishop of Lichfield, Charles Forster MP and the Mayors of Lichfield and Walsall.

Labourers, carrying banners, preceding Bloxwich Brass Band, led the procession from a highly decorated Walsall Railway Station to the Moat Reservoir. Having encircled the site, the party returned to the station, stopping on the way at the Junction Inn to witness a special event arranged by John Boys, the reservoir contractor.

Over a hundred workmen were treated to a roast sheep lunch for their labours after the Bishop of Lichfield had said grace, and in a few words congratulated the men on the day's proceedings, suggesting that thankfulness for God's gifts was shown by moderation in their use. As the first part of the proceedings ended, three large Montgolfier Balloons were discharged as a grand salute.

At noon the party boarded the special train at Walsall Station en route for Lichfield. The first stop was Brownhills where the standpipe was inspected. It was contained within a tower one hundred feet high, up which water was pumped so as to obtain an altitude sufficient to reach the most elevated position in the area to be supplied. Within a mile of Lichfield the train stopped, opposite the newly built engine house at Sandfields. Sited near to the railway, the building was principally constructed with blue bricks, ornamented with various coloured bricks and was the work of Messrs. Branson and Gwyther of Birmingham. The building was designed by Edward Adams of London who had been responsible for designing several railway buildings, hence the railway look to the Sandfields Pumping Station. It was substantially built, and had to be equal to the strain that would be imposed upon it when the engines were running, by the vibration of the pumping equipment. A pilot well had been constructed, fourteen feet diameter by seventy seven feet deep, connected to three sump wells, each eight feet diameter by seventy feet deep.

After admiring the steam engine installation, Lord Ward was called upon to perform the opening ceremony by setting the one hundred and fifty horse power engines in motion.

John McClean handed an elegantly designed lever to Lord Ward who moved the valves, admitting steam into the cylinder. The polished steel bar with an embossed gilt handle was inscribed, "This starting bar of the steam engine made by James Watt and Company for the South Staffordshire Waterworks Company was presented to the Right Hon. Lord Ward to commemorate the Inauguration of their Works at Lichfield on the 26th October 1858".

After the engines had been started and the applause concluded, the party returned to their seats on the train which then proceeded on its one mile journey to Lichfield City Station. On arrival at Lichfield Station the company again formed into procession and escorted by Mr. Mark's Juvenile Band proceeded to inspect the works at the Minster and Stowe Pools. The party reformed and headed for the Guildhall, passing through Lichfield streets lined with great numbers of the local inhabitants, the event having created quite an interest in the city, with even the bells ringing out.

Dinner for two hundred and eighty guests was arranged at the Guildhall, Chairman Richard Chawner was supported on his right by Lord Ward, Lord Alfred Paget, W. Elkington (Mayor of Lichfield), and Charles Forster M.P., on his left sat the Bishop of Lichfield, the Lord Lieutenant (Lord Hatherton), Colonel Dyott and Dr Holland. Among the other guests were the Directors of the Company, Charles Simpson (Town Clerk) and Councillors of Lichfield and the towns to be supplied.

The officials connected with the undertaking who were present included J.R. McClean, F.C. Stileman, E.B. Martin (Resident Engineer), H.M. Wainwright, J. Churchill, H.W. Blake and G. Hamilton of James Watt & Company, John Cochrane, John Aird Jnr., John Boys Jnr. and Messrs. Branson and Gwyther.

Typical of the Victorian era ceremonies, no females were invited to the dinner. A large number of ladies occupied the gallery at the end of the hall, and by the waving of their handkerchiefs, gave expression during the proceedings, to their approval of the toasts and sentiments expressed by the speakers.

Lord Ward proposed a toast to "The Engineers". He observed that Mr. McClean had not made his services the mere performance of charity but had thrown his whole heart and soul into the work, and that was the most satisfactory guarantee of its eventual success. It first existed as an idea in his mind and, although a long period had elapsed before it was carried out, the scheme was brought to fruition by its originator. Mr. McClean deserved all that could be said in his praise and how great a benefit he had conferred on the district of South Staffordshire by designing and bringing to perfection that important work.

He proposed a toast, "Success to the South Staffordshire Waterworks Company and the health of the Chairman and Directors," and concluded by saying the blackening smoke of the district affected vegetable and animal life of every kind.

It affected men, women and children from infancy to old age, and the most passing want was the want of water to quench the thirst, a want felt daily and hourly.

The Bishop of Lichfield said the work of which they had seen the completion of that day was a work of real benevolence, for it must be true benevolence to contribute to the cleanliness and health of thousands of their toiling fellow countrymen.

He quoted an old saying which he thought hyperbolic but containing a great proportion of truth, " Cleanliness is next to Godliness".

John McClean said he felt it to be his duty to address some remarks to them with respect to the position and prospects of the undertaking. In the present case he was happy to be able to assure the shareholders that if consumers could be obtained the supply would never fail. There were three sources from which the water was obtained, firstly from a tunnel upwards of a mile in length, driven in through the sandstone rock at Lichfield which literally teemed with water, secondly from four shafts and two borings sunk in the tunnel, both yielding large quantities of water. Thirdly water from the surface of a vast tract of land above the influence of the sewage of any town, all of the water being of the softest and purest quality. These three sources would produce about sixteen million gallons per week. If it was necessary to double the quantity, the Company's Parliamentary powers enabled them to extend the tunnel for approximately two miles, through the sandstone rock, cutting in its course, new watersheds and ultimately reaching Bourne Brook, above Hanch Mill where almost an influence of any sewage, flowing through Cannock Chase might be obtained.

So much had been said on various occasions respecting water deficiency, that he deemed it his duty to make these statements so that the facts might publicly be made known. The weight of the main was about seven thousand tons and when the branches to Dudley and West Bromwich were completed, the total length would be twenty five miles. Total storage of the reservoirs at Lichfield, Walsall, Wednesbury and West Bromwich when completed would be ninety million gallons. After describing the two engines at Sandfields, he said they were independent of each other and would be able to pump five million gallons of water a day to Walsall Reservoir.

R.C.Chawner proposed a toast to the contractors. He referred to a mysterious part of Lichfield called Swan Moggs. It looked like a toad, ugly and venomous, but it held a precious jewel in its bowels. They had to find a man of sufficient courage to descend those depths to work underground and he was certainly alarmed when he saw Mr. Aird and his men vanish from sight under the tunnel and was much relieved to see them march safely into the clear light of the day. He spoke of the effect of the Company's works in the city. The Mayor, Town Council and the Feoffees of the Conduit Land Trusts were alarmed when the Company came armed with their legislative powers. He felt nothing but respect for the corporate bodies, but the rest of the inhabitants of Lichfield, more especially those who live in the neighbourhood of Swan Moggs, or should he have said vegetate, they became alarmed at the thought of losing those terrible pools now turned into reservoirs of pure water.

Chawner said he lived in the district and he knew how many bosoms palpitated as if their very existence hung upon it, lest any disturbance should happen to the placid surface of the stagnant pools. He trusted that their alarms were allayed and that the corporate bodies, and the inhabitants generally, were satisfied that the Company meant fairly and honestly to carry out their project without trenching upon their rights.

With dry humour he said the Company had had to meet the projects of a number of amateur projectors and also amateur engineers, who appeared to be numerous in the district, who related there was no water for the inhabitants, even less for the black country.

He believed the ancient inhabitants of Lichfield, and he saw it proclaimed, not from the house tops, but from the street corners, not that it was a land flowing with milk and honey, but overflowing with water. If you come from the Cathedral we pass through Dam Street, and touch upon Brook Lane, we make our way into the town by a street named Wade Street. After going a short distance you come to a street whose name indicates as much water as land, Sandford Street. It was true that Beacon Street was just above them, but that was so named only to warn the pilgrim from the country town to beware of the fatal swamp before him. There was no escape except by Bore Street and then at length you arrive at Greenhill where on bended knee you return thanks to St. Michael for saving you from a watery grave. Looking at these indications of the character of the locality, he thought the Company were justified in persevering in their scheme.

Dr. Holland of Lichfield said that with regards to the works he regretted in common with many, the delay that had taken place in their completion and should be glad when the balaclava state of the roads in the neighbourhood of Stowe Pool, they being a perfect quagmire, was altered, living as he did near the pools, and coming much into contact with the workmen employed there, he wished to bear his testimony to their good conduct. He was exposed to any depredations they might commit but he had never suffered any loss or convenience from them. They had given the police very little trouble, the county magistrates had heard nothing of them, he had very great pleasure in expressing his satisfaction at their good conduct.

Mr Elkington the Mayor responded to the toast drunk to himself and the Corporation of Lichfield. He said he should be sorry for it to go abroad, that the Corporation of Lichfield had shown a disposition to interpose obstacles to the entrance of the waterworks company into the city. They were bound to protect the rights and interests of the citizens, which they had endeavoured to do. He trusted that the undertaking would prove highly beneficial to the working classes in the populous mineral districts of the County.

Reference was then made to Mr. Blake of James Watt and Sons who constructed the engines and to Mr. A. B. Cochrane, the contractor for the casting and laying of the pipework. Out of the 7,000 pipes laid down, only two had to be replaced. This fact reflected well on Edward Marten who superintended the main laying.

Praise was also given to Mr. Aird, the mainlaying sub-contractor, and his foreman Mr. Walker. In conclusion, praise was extended to Mr. Wainwright, the solicitor, and Mr. Churchill, the secretary, for devoting all their energies to the project.

In returning thanks for the toast proposed to him, Henry Wainwright said he was proud to have the undertaking's engineer Mr. McClean, a man who would leave a mark, as his intimate friend and of the fact that his and Mr. McClean's names were on the back of the Bill as the registered projectors.

At the conclusion, the assembly returned to the railway station, where two trains were ready to convey them back to their original starting out points.

John Boys Jnr. arranged a Grand Inauguration Fete on the grounds at the rear of the Junction Inn, Bridgeman Street, Walsall. It was intended to hold the celebration on the grounds encircling the Walsall Reservoir, but its exposed position and the time of year prevented that.

An admission fee of sixpence was charged with no reduction allowed for children. Nicholls of Birmingham directed the events, similar to shows previously staged at Dudley Castle Fetes. Included in the programme were balloon races, a walking on the ceiling act and a fireworks display billed as being performed by the Pyrotechnic Artist, J. Wilder of Birmingham. Bloxwich Band provided the musical entertainment which included selections of overtures, waltzes and dance music of the day. The grounds were illuminated by thousands of illuminated lamps, no account of the day or attendance was recorded but it was stated that carriages were in attendance in Bridgeman Street, at nine o'clock in the evening to convey people home.

A supply to Walsall.

The first phase of construction work was completed by December 1858 and water was flowing to Walsall. Attention was now directed to the provision of distribution mains, service pipes, rates and regulations. An original plan of supplying water in bulk at a rate of 6d (2.5p) per thousand gallons failed to materialise. As a result, the Company was compelled to become a water distributor, and mains and service laying was contracted out. W. Peters of London laid the first service pipes in Walsall in 1858, the Company recouping the cost of work from the prospective consumers, the average cost of a service was ten shillings. The contract for services was at a later date let to John Aird, whose charge was one shilling a foot.

Walsall's water supply prior to this had been, and remained for some time, public wells for the poor and private wells at the rear of many of the larger type houses. Towards the end of the 14th. Century, an Able Well existed near the junction of Ablewell Street and Rushall Street with a similar watering point in Warewell Street and in the same vicinity Haynes Well. Walsall commissioned a "head of water house" at Vicarage Moor with a conduit conveying a supply to a cistern in High Street, covered over by a Conduit House, reported to have had a plaque inscribed in gold letters and bearing the Town Arms.

Towards the latter part of the 18th. Century the Vicarage Moor source was in use at High Street, Digbeth, Park Street, Rushall Street and a portion of Ablewell Street. By 1830 the supply had been contaminated by gas, which it was claimed was killing off the frogs.

Water charges.

Water rates to the Company were payable quarterly, in advance, and based on the Annual Value of the premises: i.e.

Premises Annual Value £4 - £5, charge per quarter 1s 8d.

Premises Annual Value £100, charges per quarter £1.5s.0d.

Additional charges were made for each private bath at 2s.0d. per quarter.

Where more than one water closet was installed, an extra 1s.0d. per quarter was charged. These charges were circulated in the first water regulations booklet compiled and circulated in 1858.

Works at Wednesbury, supplies reach Darlaston and Tipton.

Contract No 5, for the construction of a reservoir at Church Hill, Wednesbury, was awarded to Chambers & Hilton of Birmingham who sub contracted the work to John Boys Limited.

Exploration and clearance work started on site in November 1858 although the land contract was not completed until 31st. December 1858. The cost of the ground purchased from Thomas Walker was £7,300, part was resold to Isiah Kendrick, reducing the Company's costs to £3,957, after reserving the mineral rights to 40 yards of the land sold. Included in the sale was a cottage and a right of way, behind two other cottages, from the highway in Church Hill, these other properties were not purchased until 1923. This earthen embankment type reservoir, circular in plan, had a capacity of 1,538,190 gallons at a depth of 18 feet with a top water level of 543.47 A.O.D. Construction work, completed in November 1859, allowed the receptacle to be part filled but the whole of the contract, worth £2,248 was not completed until April 1861.

A stable situated on the site was eventually converted into a cottage. A report, issued in 1908, recommended that the Company should reline or cover over the receptacle, but it remained open until Messrs. Davey & Company of Runcorn were awarded the contract to cover the reservoir in 1923. Ninety six piers supported the roof, the cost of the work was £6,331 nearly treble the original cost of the reservoir. Wednesbury Reservoir was taken out of commission on 14th of May 1974 and the site subsequently sold.

A special meeting of the Wednesbury Local Board of Health met for the purpose of considering a proposition of the Company to supply water in bulk leaving the Local Board to supply it to the individual consumers. The Surveyor presented a statement showing the number of houses in the parish and their rental. There were 1,364 at £5 per annum or under, 1,167 above £5 and under £10, 376 at £10 and under £20, 112 at £20 and upwards but under £30, and 49 at £30 and upwards.

Taking the tariff of the South Staffordshire Water Works Company and supposing all the inhabitants took water he calculated that the income would be £400 per quarter. This was allowing each inhabitant to use 10 gallons a day which was a lower scale than the Government surveyors recommended. The cost of the required water, 14,600,000 gallons per quarter, was £365. He however stated that the Company's rates were charged on the gross rental, whilst he had calculated on the rateable value, and allowing for this difference would increase the receipts. After some consideration the board decided not to take the water in bulk, as the result was too uncertain to justify them in taking such a step. Other local authorities followed Wednesbury's example, being loath to risk the finance for the water and laying pipework for distribution purposes.

Mains and services were laid in the surrounding areas of Wednesbury in 1858/1859 but delays to work were inevitable due to bad weather conditions intervening.

With the Company's supply available in Wednesbury the town's Board of Health ordered their Surveyor to submit samples of water taken at several sources in the town. These were submitted to Dr. Hill at the Borough Analyst's Laboratory, Sydenham College, Birmingham. No 1 was taken from a well in Union Street on property belonging to Mr. Danks. No 2 was the South Staffordshire Waterworks supply. No 3 from a well in Ladbury's Lane on property owned by Mr. Green. No 4 from a well in Beggars Row on property belonging to Mr. Britten.

No 5 from a well in Holyhead Road owned by Mr. Jeavons and No 6 from a well in Dudley Street supplying property owned by Mr Hollis. Of these supplies the well in Beggars Row was extensively used. In his report Dr. Hill stated that only two out of the six samples had any claim to purity, these were No.s 2 & 3. The other waters were all very impure, they contained enormous quantities of total solid matter and nitrates derived from sewage or surface drainage. They abounded in chloride of sodium, indicating the same sources of impurity, added to this the waters were very hard. Dr. Hill further stated the waters were undesirable either as beverages for cooking or washing, not able to properly cleanse and enormously wasteful of soap. It was his opinion that if there was a command of the No.2 sample, South Staffordshire Waterworks supply, the use of the others should be entirely abandoned except for flushing or swilling purposes.

Darlaston's supply was effective from April 1859, and water reached the Tipton district on 28th March 1860.

Under an agreement with Wolverhampton New Waterworks Company, a main was carried to Bilston and the water laid on for the supply of the Company, in bulk. This supply was subsequently discontinued.

During February 1859 the Lichfield engines were employed in pumping the water from the heading to enable J. Boys and Son to carry out work on a short length of brick lining in support of the tunnel to Sandfields Pumping Station. The contractors own engines were unable to cope with the flow of water. It was possible to calculate the flow from the tunnel and borings alone, the yield was 1,500,000 gallons daily.

Dudley's water supply.

Providing a water supply to Dudley and beyond was high on John McClean's priority list as this portion of the district contained many prospective customers who had never enjoyed a piped supply. McClean suggested the desirability of housing a covered reservoir in the courtyard of Dudley Castle. Permission to lease the site was refused by the Earl of Dudley's agent stating that the project might seriously affect his Lordship's interests. On the horizon appeared the solution to McClean's storage problem, when Dudley Waterworks Company asked for a meeting of the two undertakings to discuss arrangements for the future of the supply of the Dudley area in April 1860. An inspection of the Dudley works was carried out by McClean and his findings were that both reservoirs at Shavers End and Parkes Hall plus the mains network were in good order. With the prospect of securing a ready made reservoir at the high point of Dudley, negotiations commenced for the purchase of the Dudley undertaking.

Dudley's water position during the previous seventy years makes depressing reading. Towards the end of the eighteenth century there was considerable concern, by the inhabitants of Dudley, about the inadequacy of a potable water supply. The inhabitants were dependant entirely on, private wells from 15 to 180 feet deep, some fitted with pumps, rain water cisterns, usually installed below ground fitted with pumps, ponds and a few public wells.

An organised scheme was demanded by the inhabitants, an attempt to remedy the situation began in 1791 with the passage through Parliament of the Town of Dudley Act, (31 Geo 111, C 79, S 25), under which the town was to be governed until 1852. The Act authorised Commissioners to levy a rate for providing improvements, namely, street widening, paving of footpaths, lighting and a water supply. The water supply was to be free for the use of inhabitants. The elected Town Commissioners, property owners in the main, were responsible for carrying out the Act. As principal ratepayers the finance for providing the improvements had to be funded by themselves. Little wonder that the majority of them did not apply themselves to their task.

Forty six meetings of the Commissioners were convened in the three years. Up until 1794, twenty six meetings were adjourned for the want of a quorum and twenty meetings broke up in disharmony.

Some steps were taken to try and improve the water supply position. In November 1791 a committee was appointed to set out several reservoirs upon the line of an intended watercourse, presumably a scheme, planned and designed by William Thomas Hateley, bringing water from Coopers Spring, Roundshill, Rowley to Waddams Pool, Hall Street, Dudley. In January 1792 Hateley reported to the Commissioners that the watercourse was part completed and provision should be made to build the intended reservoir and basins. He was requested to prepare estimates which he duly provided. Estimates were prepared for the cost of conveying water by pipes into the town to supply a well near St. Thomas's Church and public wells near the Town Hall, at that time situated in the Market Place.

A reservoir or basin was constructed by James Wainwright, in a meadow owned by the Earl of Dudley, near the Freebodies, at Kates Hill, Dudley. The receptacle was made mainly of brick and wooden planks, provided at a cost of £185.

In June 1793 Thomas Howes, was requested to make a quantity of culvert bricks to lay a conduit from the reservoir to Waddams Pool. Four months later it was ordered and agreed that the dam of the reservoir be immediately made secure and put in a proper condition to hold water. The scheme was finally abandoned as ineffective in March 1800. Charles Roberts reported to the Commissioners that at the request of the Earl of Dudley he had surveyed the watercourse line, springs and reservoir intended for supplying the town with water and decided the plan was inoperative. He recommended the inhabitants to put down town pumps in proper situations under the direction of the Commissioners.

On April 18th 1808 the Commissioners ordered that the watering pool called Waddam's Pool be immediately filled in.

In 1810 it was ordered, that a well be sunk and pump put down for the use of the inhabitants of Priory Street. In the same year the dam at the Freebodies was cut through and the water let out immediately on the orders of the Commissioners.

On August 9th 1810, the Commissioners considered a plan for raising capital and forming a company for supplying the town with water from certain springs in the area. It was to be called the Dudley Waterworks Company and to be incorporated by Act of Parliament. Later it was resolved that the town cannot consent to the application being made to Parliament without being fully assured that the powers and privileges of the present Town of Dudley Act, for supplying the town with water, will not be infringed upon. On 26th. of May 1826 a requisition signed by numerous inhabitants of the town addressed to the Clerk of the Commissioners requested that some means should be adopted to secure a supply of water to Dudley.

Messrs. Bourne and Sons, Solicitors for the Commissioners, issued a notice on November 11th 1826 applying to Parliament for an amended Town Act giving more definite powers to provide Dudley with its organised water supply. Some ratepayers were concerned about the cost of the amenity, expecting enormous increases in their rate demands. One ratepayer issued a public notice, condemning in strong terms, the expense involved and the unnecessary powers to supply an area of 15,000 inhabitants stating "Water will never be brought to this town except at great expense", £17,000 was the estimated cost.

William Richardson was instructed to ascertain if the town could be supplied under the old Act, and also the condition of the abandoned works. He found that the springs had become so lost and diverted to be of no use at all.

A new plan designed by a Mr. Rofe, a Birmingham Civil Engineer, was not carried into effect. His account for £91. 15s. 0d. was considered to be exorbitant. The Commissioners offered £50 which was not acceptable to Rofe who finally settled at £75.

Some activity was shown by the Commissioners in the following six years for they ordered that -

1. A reservoir was to be completed, later enlarged and a pump put in at Pitt's hole by a John Raybould.
2. A well near the Vicarage be deepened and a tunnel driven from it to increase the "come" of water.
3. John Raybould's tender of £38 be accepted to construct a cistern to receive rain water from the roof of St. Thomas's Church to provide soft water for use of the inhabitants.
4. Iron pumps be put down in Watson's well.

Thirty spirited citizens met and decided to enhance the towns amenities, by promoting a public meeting calling for action on the water supply problem. As a result of the meeting the Government of the day was petitioned for a private enactment, empowering the Dudley Waterworks Company to be formed. The Act was given the Royal Assent on the 16th of June 1834, under which the capital sum required was not more than £20,000 in shares of £50 each. Amongst the forty subscribers to the works were; James Bourne, Jane Cook, John Jesson, Charles Molyneaux, Job Pitt, Edward Terry and John Twamley.

Water for the undertaking was to be obtained from springs and watercourses at Ruiton, Gornal, High Ercall, Woodsetton, Coseley, Wrens Nest Hill, Parkes Hall and a spring called Penny Well. The Company's first General Meeting was held at the Dudley Arms Hotel, High Street, on 15th of July 1834. William Richardson was installed as Engineer. He also held the post of Engineer to Dudley Gas Works built in 1821.

In February 1835 the directors advertised for tenders for excavating and embanking two uncovered reservoirs, one at Parkes Hall the other at Shavers End, Dudley.

A borehole and heading was constructed at Ashfield by Samuel Edwards, the shaft was thirty yards deep and the horizontal headings collected the springs. The pumping station at Parkes Hall was equipped with two 18 inch pumps which operated twelve hours per day. Water ran down to the adjoining reservoir where there were two pumps. In addition there was another engine driving a six inch pump, backed up by an eight inch pump, in a well without headings. The surface land drainage water was directed into the reservoir. Parkes Hall Station was constructed and steam engines and pumps installed, to deliver the water, through cast iron mains, laid in Eve Lane and then along Burton Road to Shavers End Reservoir. Water was then gravitated on to the district.

Other plant was installed at, Hurst Hill where water was taken from the limestone hollows and water was also pumped from mines near Deepfields, Coseley, owned by Messrs. Bagnalls Ltd.

In Dudley in 1848 there were complaints from the poorer classes both of the cost and the quality of the water. Many were not supplied at all as the Company's mains covered only a small part of the town. The cost of water was sixteen shillings per year for the smallest house plus two pounds to lay on a supply. In consequence many purchased water at a halfpenny a pail, plus another halfpenny for carriage from the Castle Springs. Salop Street was an area supplied by Dudley Water Company's mains, but the inhabitants preferred to walk the four hundred yards to the spring, stating this water was preferable to the undrinkable mains supply.

By 1850 the Company supplied about one quarter of the houses in the town. The supply was intermittent, generally every other day, remaining on from half an hour to two or three hours, and during the summer months very insufficient in quantity. The quality of water supplied was objectionable, very hard and at times and having a milky appearance. Henry Medlock F.C.S. took and analysed water samples at Dudley. In his report he stated that, " Not only are the waters of Dudley Waterworks totally unfit for washing and for steam boilers, but also for making tea and culinary operations generally." The solid matter in 100 gallons of water from the premises of Mr.C.G. Brown in Bilston, would destroy fourteen and a half lbs. of soap before a particle became available as a detergent.

The shortage of supply during 1851 caused the streets to remain unwatered for days and great distress existed in the town.

Many of the inhabitants were obliged to steal supplies, use canal water, which was in a most impure state, or beg water from enginemen at works where engines were working. Most of the townspeople were kept in the most filthy conditions, as many as forty people waiting at one well to draw water. Faced with many difficulties, the hilly nature of the district made the system of mains intricate, the supply of surface water fell off and much water was lost by mining operations. Seven public wells were repaired and fitted with pumps. It was stated that there was always ample water in the "green rock", (basalt) and some of the wells were in that rock.

John Robinson McClean, following his appointment as Consulting Engineer to the undertaking, projected his scheme to bring water from Lichfield to Parkes Hall Reservoir. His scheme was considered too costly. The Financial position of the company was insecure having contracted debts of between £4,000 to £5,000 by 1851, its future, always at risk, was soon to disappear.

The Report to the General Board of Health on a preliminary inquiry into the sewage, drainage, water supply and the sanitary conditions of Dudley was carried out by William Lee from the 12th to the 20th of July 1851. It was stated that comparatively few houses were supplied because Dudley Waterworks refused to supply tenanted houses. This exception was only waived when landlords were willing to be responsible for paying the water rates, in most cases rents were increased by more than the amount needed to cover the water rate, providing the landlord with additional income.

Deprivation experienced by the poor in not being able to afford a piped water supply resulted in many being forced to use cellar drainage water. Cawney Hill district housed many of Dudleys poorest inhabitants and it was possible to obtain supplies from Watsons Well but this source became exhausted in consequence of certain alterations carried out by Lord Ward. An effort was then made by the inhabitants to sink their own communal well but having sunk a borehole deeper than expected no water was found William Lee also reported that several wells in the district lost their water supply as a direct result of mining operations and many had suffered following the construction of the Oxford, Worcester and Wolverhampton Railway Tunnel, when a great bulk of the water disappeared.

Pump maker John Baugh gave evidence on the wells in use in the district which varied in depth from five yards to sixty. There were few places where water could not be obtained at any depth. An average depth well of thirty yards would cost from £1 to £1- 5s-0d per yard to construct. Cost of the cast iron pump was fourteen pounds and a wooden one thirty pounds for that depth. A pump of that kind, if the water was sufficient, would provide a supply to ten houses and would cost five shillings per annum for repairs. A windless rope and bucket would cost from two pounds to two pounds ten shillings. There are a great number of soft water cisterns which are generally below ground level, constructed of bricks and mortar. An average size receptacle of nine feet square cost nine to ten pounds, many were provided with pumps at a cost of two pounds, ten shillings. These cisterns would serve four houses. Water tubs of all sizes were available which when set up on bricks with proper cover and tap complete cost two pounds, painting and repairs to these receptacles used by the middle classes would account for one shilling and sixpence a year. The poor paid three to five shillings for a small cask which would be gone in two years without ever having been repaired or painted, unless the soft water containers were covered, the water soon became very foul. A wooden pail cost four shillings, iron pails two shillings, the more respectable preferred wooden pails. Powder casks were in use as pails, some used earthen pans called "jowls", these containers were soon broken.

He concluded his evidence by saying "I have known people have to go half a mile, and be happy to get a little water at that distance. I have known them have to go even a mile for water, and I have known when they could get water off their next door neighbour. Some use very little water, sadly too little, it is fetched by girls, who carry it on their heads. I should say that a penny a week would be little enough even for shoe leather, for fetching and carrying the water for a poor mans family, that distance. I know that there are very many poor people in Dudley that are very badly off for water, that they are put to very great straits, and are in a very filthy condition".

William Lee in the minutes of his inspection of the water mains to Bilston and Parkes Hall stated that; "Examined the main pipe, it is now above ground at Sedgley. It is broken, leaking and collared above the surface of the ground, which has sunk from time to time, ten feet or more and the pipes have had to be continually altered and raised. In another place the pipes have been raised, just now, about three feet above the road and have eleven collars, showing fractures in less than fifty yards length, this is the Bilston main.

In another place the pipes are now five or six feet deep below the surface, broken from the same cause and five men were raising them at the time of my inspection".

By 1853 six of the seven public wells remaining in the town, tapped springs at a depth of thirty feet, this was surface supply and very uncertain in quality during the summer, the seventh well was a cistern fitted with a hand pump which was fed with water from the roof of a parish church.

The limits of the Dudley Waterworks Act were the Borough, the Castle, the parish of Sedgley and Tipton and the township of Bilston. The company were bound under certain conditions, set forth in the Act, to supply water to all who demanded it on prepayment of one years rent.

In Dudley 1,800 houses were supplied and in Bilston and Sedgley 1,200, the charges ranged from eight shillings and eight pence per house to three pounds per house per annum. With a lack of a constant supply, so few customers and little capital to improve matters, the demise and a take over of the Dudley Waterworks Company was inevitable.

The 14th half yearly meeting report.

The South Staffordshire Water Works main and service laying programme carried out by contractors continued in earnest. A report of the works was given at the fourteenth half yearly meeting of the South Staffordshire Waterworks Company.

A twelve inch main had been laid between Wednesbury, Great Bridge, Dudley Port and Tipton by March 1860 and the laying of the main between Dudley Port and the Dudley boundary was proceeding. Although the full share capital issued was £150,000 only £100,000 had been received, this had been caused by non payment of calls.

Several of the holders of shares had become bankrupt and the time necessary for declaring the shares forfeit had not elapsed. Two of the Company's most notable shareholders S. H. Blackwell and Henry Marten were subject to appearances in court for non payment of shares. John McClean the engineer said the water of the Company would be at Dudley Railway Station by April and it's distribution in the town was a matter of arrangement. The Chairman observed that there was another water company in Dudley, to which one of the shareholders, the Reverend Dr. Browne, Vicar of Dudley, replied " There is another company certainly, which might be called the "Puddle Company", the water is very good after it has been filtered.

Improving the mains network and the take over of Dudley Water Works Company.

At the half yearly meeting held in September 1860, there was some concern by the shareholders about several matters; the dividend, compared with Birmingham Waterworks Company, salaries, engineering expenses, parliamentary and law expenses and working expenses.

With regards to the revenue account and the balance applicable for dividends, at two per cent, £1,389 to be divided by the shareholders, it was much less than the directors had anticipated. The Chairman remarked that a shareholder in the Birmingham Company had informed him that in that company they were sixteen years before they declared a dividend and then it was only two per cent. He certainly anticipated that hereafter their dividend would be as good as the Birmingham Water Works Company. On the salaries issue the chairman observed that on the formation of any public company, great difficulties were bound to be encountered and the services of practical and experienced men were needed. These men could only be obtained by offering adequate remuneration. The amount queried was £24 a week for superintending men laying down pipes.

In answer to the question relative to payments to the engineer, it was stated he was paid a commission of five per cent on the amounts of the contract in addition to parliamentary expenses.

Mr. Wainwright the solicitor of the Company, then, in answer to questions from the various shareholders, proceeded to offer explanation upon the item of parliamentary and law expenses. He was sorry he said, to have heard it stated that the Company had been formed for the special benefit of the engineer and lawyer and he hoped to be able to convince them that the remark was quite an unfounded one. In the first place they had been to Parliament twice, in 1853 and 1857, and on both occasions they had met with the most strenuous opposition in both Houses, involving very heavy expenses. The money which had been paid to him had barely sufficient to cover his actual disbursements. He had received by far the greatest part of his costs in shares. In respect of charges, which most professional men would expect to be paid at the time, nothing whatever had been paid since the commencement of the Company to the present time. He had taken shares in respect of the charges and he was now to receive for the first time a two per cent dividend in respect of those shares representing those charges.

A statement was then read of the numbers of, meters, service pipes and houses supplied in the various districts to date; Walsall 1,108, Wednesbury 1,950, Darlaston 1,933, Tipton 644, West Bromwich 50, a total of 5,685.

Following on from this meeting an extraordinary meeting was called for authorising the affixing of the common seal of the Company to the deed or deeds connected with the purchase of the Dudley Waterworks Company. The Chairman on introducing this business, referred to the clause in their Act, empowering them to treat with the Dudley Company. He had been furnished with an estimate by Mr McClean of what it would cost to take water to Dudley in opposition to the Dudley Company and the probable cost of arranging with them the purchase of the works. They had met the Dudley Company, who had shown them their books, accounts and works, delving fully into their account of their income up to the present time. At first some difficulties arose in consequence of a portion of land or property being questionable title. This was Shavers End land and reservoir which had only a copyhold title, which had never been enfranchised. This dispute was on going between Dudley and the Lord of the Manor, the Earl of Dudley.

Mr. Wainwright read the agreement which had been drawn up under the 46th section of the Act of 1853 which enabled the two water companies to agree the conditions set forth, The South Staffordshire Waterworks Company agree to purchase the Dudley Waterworks Company including all the property and plant of that company and their rights and privileges under their Acts of Parliament except the lands at Parkes Hall, Ashfield, Bilston and the managers house at Parkes Hall. A lengthy document set forth the following to be paid in consideration of the conditions named; The Dudley Company to receive £4,300 in cash and five hundred shares of ten pounds each in the South Staffordshire Company, each share to be entitled to be treated as fully paid up and to be entitled to participate in dividends from the 30th of June 1860. The plant, property and rents of the Dudley Company to become the property of the South Staffs. Company at once, the rents to be the property of the latter company from June 1860.

The water rates received by the Dudley Company in 1859 were £2,870. 15s. against this were £400 working expenses. The Secretary remarked that it was only proposed to keep the Dudley staff on till Christmas and then a collector and engineer would be the only staff required.

The Chairman explained they would be able to give the people of Dudley a twenty four hour supply of water whereas at present they only received a twelve hour supply. After further discussion a motion was proposed, seconded and carried unanimously that the agreement, produced and read be received and adopted and the Seal of the Company affixed.

The Take-Over was not completed until May 1862. According to the annual reports and accounts, the purchase price shown was £21,404 discharged partly by shares and partly by cash payment.

Coneygre Reservoir, Tipton.

As a consequence of the whole of the district between Wednesbury and Dudley having been excavated by mining operations, great difficulty arose in procuring a suitable site for a reservoir and engine to boost the supply to Dudley and West Bromwich. The plan to construct a reservoir at Hill Top, West Bromwich was abandoned when the Great Western Railway refused to allow the receptacle to be built over their railway tunnel in Tunnel Street.

After negotiations, the Directors succeeded in purchasing six acres of the favourably situated Coneygre Estate from the Earl of Dudley, at a cost of £3,744. Excavations on the site, to construct the open reservoir, started in late 1861. Contractors, John Aird and Sons, had secured the contract with a tender of £3,414. By March 1862, work had been completed.

The Coneygre Reservoir, bounded by the Birmingham Canal, the South Staffordshire Railway Line and the new Sedgley Turnpike Road, renamed Park Lane West, was a five-sided receptacle measuring 200 feet at its widest point and having a capacity of eight million gallons. No water from this reservoir was distributed in Tipton.

It was suggested by a shareholder that the reservoir should be covered over to prevent the entry of foul air and dirt but this was considered too costly.

Messrs. J. and G. Davies of the Albion and Limerick Foundries and Brook House Boiler Works, Tipton, were responsible for the two 50 horse power non condensing horizontal expansion engines with 25 inch diameter cylinders and five foot stokes, each having a crank and flywheel motion so that they could be worked together or individually. The flywheels, twenty feet in diameter, weighed eight tons each.

Four boilers, were of the Cornish design. Each had a diameter of six feet two inches and were thirty feet in length. Henry Naden designed the building, which housed the plant. This was conveniently situated near to the canal for the delivery of materials and goods. The buildings were constructed by John Aird and Sons of London.

Coneygre engines were so arranged as to pump water either out of the reservoir or out of the main, into the higher level reservoir at Shavers End, Dudley. After coming into use they were kept constantly at work pumping water at a pressure equal to three hundred feet head. The quantity of coal used showed an average of four and a half tons every twelve hours, the quality being good "Engine Slack" taken from the Earl of Dudley's mines adjoining the site.

A 15 inch main was laid along the South Staffordshire Railway Line, which is adjacent to the pumping station, a distance of 920 yards to Tipton Road, Dudley, the main was then continued under the public highway to Limepit Lane, Dudley.

First engineering staff appointment.

Up until 1860 the salary of the resident engineer was paid by consultant engineers, McClean and Stileman. J. Porter became resident engineer employed by the South Staffordshire Waterworks Company in 1860, at a salary of £250 per annum.

At a shareholder's meeting in August 1861, Mr George Green questioned John McClean about the salary of the resident engineer and his duties. In his reply McClean said that the Company paid a very heavy sum for engines, mains and other works and it was important that they should be under the charge of a competent person especially the main running alongside the South Staffordshire Railway Line where any injury might be prevented and any damage quickly stopped. Mr. Green gave it as his opinion that the post was entirely unnecessary, or at any rate that a person could be found to do the duties efficiently for £100 a year. Richard Williams of Wednesbury said that the main point to consider was whether their servants did their duty efficiently or not, for they must look rather to an increased consumption of the water for a dividend than to small savings as a result of reductions in salaries.

West Bromwich water supply.

Steady inroads were now made in supplying water to West Bromwich where a mains supply was available in July 1860 although many of the inhabitants were loath to change their old ways, as supplies were available from springs and wells. Public wells were reported in use along the main roads in the 1820s and thirty years on, water from a coal pit in Pitt Street was being utilised. Wells also existed at Spon Lane, Lyndon and Mayers Green.

Of the spring supplies, Lyn Purl Well at Stoney Lane was probably the most notable. It is the most ancient of the town landmarks and it seems to have wound its weary way along an uncharted underground bed since time began. An attempt was made to trace its source as late as the nineteen fifties at which time workmen pierced into the shell of an old oak tree through which the water flowed. In 1606, according to West Bromwich court records the manor court forbade the washing of anything dirty like (filthie clothes) or beasts bellies in or near the spring.

A poet of the past wrote

Down the vale this water steers,
How merrily it goes,
It will murmur on one thousand years,
And flow as it now flows.

The spring has survived up to the present time, Alderman J. J. Grant who owned the land surrounding the well, presented to his wife Councillor Mrs. E. Winifred Grant, as Mayor of West Bromwich, and on behalf of the citizens, the deeds covering the well, to the town to mark her term of office.

Problems in the early eighteen sixties.

The early eighteen sixties was a traumatic period financially for the Company, having thus secured the supply, by constructing the initial works and introducing water into the district, shareholders and directors had looked forward to a fair commercial return on their capital but the struggle to survive continued. A supply of water was available but the cost of laying services was proving a deterrent to prospective customers. Financial consideration impelled the Directors to consider leasing the undertaking to John McClean. The storm was overridden by the Directors pledging the shares of the Company with what were known as Lloyds Bonds.

During the first ten years of the undertaking's existence, only two dividends were paid: two per cent in 1860 and two and three quarters per cent in 1862.

Josiah Churchill, Secretary of the Company, wrote to the local authorities in an effort to sell water for watering the streets of the towns.

This communication set forth the terms to supply water to the chief thoroughfares but the cost of the hydrants and fire plugs were to be borne by the authorities. The Chairman quoted the old proverb, "They could take the horse to the water, but not make him drink". They had brought the water to the towns, canvassed the people and begged and prayed them to take water, but they would not until circumstances forced them.

The first of the fire engines to use the Company's water arrived at Wednesbury in December 1862. An engine built by Messrs Shand and Mason of London, entered the town, drawn by four grey horses, with postillions in red jackets, and eleven firemen dressed in new, showy and effective uniform. The engine had previously been tried at West Bromwich, the trials being conducted by Mr. Shand in person.

Although arrangements had been made with the Company, the supply of water in the Market Place was found not to be sufficient for the purpose, the brigade moved to High Bullen where the equipment was tested and displayed. The agent of the Royal Insurance Company was asked to sign a document, presented to him by the engineer Mr Porter, agreeing to pay all expenses. A complaint was made by the manager of the insurance company to the water company who pointed out the dangers and risks to the town properties because of the lack of water. In order to obtain water from the mains, wooden plugs were removed and standpipes fixed to the main. This method was followed by the installation of Boyd's Patent Combined Lamp Post and Fire Plugs. These consisted of an ornamental lamp post with a fire plug or hydrant fixed at the base. They were said to be frost proof, requiring no bars and keys for shutting down, allowing a roll of canvas to be attached and the apparatus to be operated by one fireman.

In Dudley it was recommended that seven were fixed in; the Market Place, opposite St. Edmunds Church, front of St. Thomas's Church, High Street, near the Post Office, front of Miss Hughes's garden near to Mr. Renaud's residence, junction of the Parade and Salop Street, and at the junction of Fountain Street and Constitution Hill. Several were also fitted in Walsall. In 1953, a fire officer noticed that two lamps in the Caldmore area of Walsall had abnormally thick bases and that on a wall near to them was a weather beaten plaque worded, "Fire Lamp Plug." After examining the trap door in the base of the lamp standard, the officer found a hydrant complete with a screwed outlet pipe controlled by a hand wheel valve. Examples of these hydrants could be seen at the corner of Mount Street and Silver Street, near to Highfield Passage, Bath Street, and at the corner of Oxford Street and Caledon Street, Pleck

Main and service laying was continued on a large scale, the average cost of this pipework is exemplified by a quotation received from the Swan and Small Heath Foundries, West Bromwich, dated May 3rd. 1862.

Gentlemen,

We beg to offer to supply water pipes and lay them to your order in this neighbourhood as under viz.,

2 inch socket pipes at	2 shillings and seven pence per yard.
3 inch	3 shillings and one penny per yard.
4 inch	4 shillings and one penny per yard.
6 inch	6 shillings and 6 pence per yard.

Payment in Preference Shares at four and a half per cent.

We remain,
Gentlemen,
Yours obediently,
John and Samuel Roberts.

Messrs. McClean and Stileman.

From March to August 1862, 18,000 yards of main varying in size from 3 inch to 8 inch was laid in the Dudley and Tipton areas, giving a supply to consumers as distant as Woodside, Netherton and Oldbury.

Summary of the works.

On 28th August 1863, John McClean gave a description of the works executed since the incorporation of the Company:-

Water supply. This is derived from springs which flow into the tunnel constructed by the Company, through the new Red Sandstone formation at Lichfield. The tunnel is one mile in length, having a sectional area of eighteen feet.

Another source of supply is the brook at Leamonsley, near Lichfield, which receives the springs that flow from the sandstone overlaying the district, and the rainfall of an area of 2,600 acres extending towards Burntwood and Cannock Chase. In addition to this supply, the surplus flood water of the brook during storms is impounded in Minster Pool and the Stowe Reservoirs at Lichfield, (this reached Stowe Pool via an overflow weir sited at one end of Minster Pool, this constant flow allowed the water to be kept fresh, a system of valves allowed water to be discharged into the tunnel to Sandfields in times of emergency). Water from Trunkfield Mill Stream flows wholly through the sewers of Lichfield and is not used as a source of supply.

To prevent contamination of the water, intercepting sewers upwards of two miles in length, having their outfalls below the Stowe Reservoir, have been constructed, thus excluding all traces of sewage from both the brooks and reservoirs. Another Tunnel, two miles long, between Stowe Reservoir and the Bourne Brook which flows past Hanch Hall, is planned. This supply of water was estimated at five million gallons daily, exclusive of the spring water intercepted in the cause of the tunnel through the red sandstone.

Reservoirs. The Company has constructed two reservoirs at Lichfield and one at all of the following towns: Walsall, Wednesbury and Tipton. Dudley Reservoir is also in use. Of these reservoirs, four are for storing ninety million gallons of water, the other two are for local purposes, i.e. one, Minster Pool, for cleansing Lichfield sewers, and one for supplying the high district of Wednesbury.

Pumping Engines. Two pumping engines of one Hundred horse power each are in use at Sandfields, Lichfield. Two of fifty horse power each, have been erected at Coneygre, Tipton. The engines at Lichfield are connected with Stowe Reservoir by means of a tunnel from which the spring water is derived and a iron main and conduit of three feet diameter extending under Minster Pool to the Stowe Reservoir. A third engine is in the course of construction. The pumping engines are connected with Walsall Reservoir by a twenty two and a twenty four inch main for the remainder of a total distance of ten and three quarter miles. The main is continued from Walsall to the Wednesbury Reservoir for two miles by a twenty two inch diameter pipe and for the remaining distance of three quarters of a mile by an eighteen inch main.

The height of Walsall Reservoir is two hundred feet above Lichfield reservoirs and two hundred and thirty feet above the level of the pumping well of Sandfields. The main continued from Walsall to the Wednesbury Reservoir for two miles by a twenty two inch diameter pipe and for the remaining distance of three quarters of a mile by an eighteen inch main. The height of Wednesbury Reservoir is sixty feet above Walsall Reservoir. From Wednesbury to Coneygre, the main is twelve inches diameter and four miles in length. Coneygre Reservoir is forty feet below Walsall Reservoir. Shavers End Reservoir, Dudley is two hundred feet above Coneygre Reservoir. There are two pumping mains between Tipton and Dudley. Although constructed at different levels, all the reservoirs at Walsall, Wednesbury and Tipton are supplied at the same time by Lichfield's engines. This is effected by an arrangement of the valves, the mains being protected from fracture by the operation of an air pipe about one hundred and twenty feet high, which has been constructed at the summit of the main at Brownhills, the air pipe being carried twenty feet above the level of the highest reservoir.

Throughout the area, twenty miles of main pipes, varying from three feet to one foot in diameter, and seventy miles of service pipes, varying from two to eight inches in diameter have been laid, and nine thousand six hundred connections made for the supply of consumers.

The 1864 Act of Parliament.

In 1863, the Company, determined in the increasing demands made on them for main laying in the outlying districts, found it necessary to seek Parliamentary powers for fresh capital, £160,000 share with £40,000 borrowing powers. This was realised under the 1864 Act of Parliament. The Company had not availed themselves of the powers of taking water from Bourne Brook given by the 1857 Amendment Act, within the time specified and the powers elapsed. These powers were revived by the 1864 Act. Authorisation was received to make a reservoir at Seedy Mill. The original proposal to provide an aqueduct to Stowe Pool was abandoned. Instead an aqueduct was constructed to connect the reservoir with the tunnel from Stowe Pool to Sandfields at a point near the Museum Gardens.

Notices to treat were served on the landowners, under whose land the aqueduct was to be constructed. One of these notices was served on the Misses Rebecca and Elizabeth Simpson for the purchase of a small field in Beacon Street, Lichfield, the land being required for the passage of the tunnel aqueduct. It was assumed that under the Act, a right existed to sink a shaft and construct a pumping engine and temporary plant was installed. The idea was to raise water from the aqueduct and pass it into the Company's storage reservoir, along one of the Company's Parliamentary streams, which ran along the bottom of the Simpson's field. However a well was sunk to obtain subterranean water which was known to exist in the vicinity.

The Misses Simpson refused to sell the field and took proceedings in the Chancery Court against the Company, with a result that the Vice Chancellor thought the Company had the powers.

This was later overruled by the Lord Chancellor when in June 1865, he decreed, that the Company had no right to purchase compulsory any part of the land and required the Company to resign their temporary occupation within a limited period.

Resignation of John McClean as Engineer and appointment of William Vawdry.

During 1864, John McClean, engineer since 1853, resigned from the position and was, as expected, asked to become a Director of the Company. Three resident engineers had been employed in the first nine years of the Company's existence. With the resignation of McClean, the Company was forced to create the appointment of Engineer in Chief, a vacancy filled by William Vawdry who became responsible for planning and supervising the works, his salary being £300 per annum paid by the Company. Until this time, McClean and his partner Stileman had continued to receive a percentage of the contracts, as payment for their services.

CHAPTER 2

1865 - 1894

Financially at the end of 1865, the Company's position was more stable. Balance of profits for the last half years trading was £2,888.13s.2d, 19,353 houses were in supply and revenue from this source was increasing. Trade supplies by meter decreased, ascribed solely to the stagnation of trade throughout the district. A small portion of the loss was attributed to water meters being fraudulently altered by consumers so meter boxes were sealed and fitted with locks.

Third engine installed at Lichfield.

By 1866, the number of engines pumping into supply at Sandfields had increased to three. James Watt had made provisions for the increase, by laying the foundations for the third engine when the original pumping plant was installed. Each of 90 H.P. nominal capacity engines were kept constantly at work at an average pressure, in the pumps, equal to 260.4 feet head. Attached to these engines were five boilers each of 35 H.P., the consumption of coal being five tons eighteen hundredweight's every twelve hours. The number of Lancashire boilers feeding the engines was eventually increased to nine. When these were condemned in 1907, four were removed and three new Lancashire boilers each 8 feet diameter by 30 feet long, suitable for 100 lbs. per square inch working pressure, were installed.

The 1866 Act of Parliament.

In March 1866, another Act was deposited in Parliament to confer further powers. Much of the proceedings in Parliament concerned the Misses Simpson Case. The Company asked for a declaratory Act, enabling them to acquire the Simpson's field, promising ample compensation. This small field, under one acre, was situated in Lichfield on the opposite side of Beacon Street to the Simpson's house, an effort was made to purchase the property without success. Although an eight feet high brick privacy wall had been built around the house by the owners, the main objection was the building of a pumping station, thereby spoiling the view. Evidence was given to the Parliamentary Committee by John McClean who stated that an injunction had been obtained, allowing the Company extended time in use of the field, where a pumping engine had been erected. This time limit expired in June 1866. The Company was expecting the tunnel from Seedy Mill to be completed by September, when it would not be absolutely necessary for a pumping engine to remain in the field.

In order to remove all causes of complaint from the Misses Simpson and the authorities and inhabitants of Lichfield, the Company was prepared to abandon the plan of building a pumping station at Beacon Street and to limit their powers with regards to the Simpson's land to two small plots. After a short interval, at the end of proceedings on 13th March 1866, the Counsel and parties were called in and informed by the Chairman, that the Committee was of the opinion that the Company ought to be allowed to carry on their works until September, and the Committee would be willing to put in a clause compelling the water company to do away with the nuisance.

It was intimated further by the Chairman that both parties should agree to his suggestion and draw up a clause to that effect, reinstating the field to its original form.

The Act of 1866 gave approval to further amounts of £80,000 share and £20,000 loan capital. Total amount of capital authorised up to this time had grown to £400,000 share and £100,000 loan capital.

Smethwick, Handsworth, Kingswinford, Brierley Hill, Halesowen, Tamworth, Bloxwich, Brownhills, Pelsall and Rushall were included in an increased area of supply, estimated to be 250 square miles with a population of 400,000.

Take over of Burton on Trent Water Works Company.

The acquisition of another smaller company occurred during this period. Burton Waterworks Company was initially formed in 1861 by some of the prominent citizens of the town. In June of that year a special meeting of the Commissioners was held to consider the suitability of signing the "Burton on Trent Waterworks Act", as required by a Committee of the House of Lords. Mr Dyott, the solicitor for the Bill, explained the principal clauses. After some discussion the meeting agreed to the signatures to the Bill, providing a clause was inserted to the effect that if the South Staffs Company failed to supply the town with sufficient water, the provisions of the Act should not apply to the town, and the authorities should be at liberty to apply to Parliament for an Act to authorise them to make and erect waterworks in the same manner, as if this Act had not passed into law. A general meeting later ordered the signatures to be put to the Waterworks Act. Initial meetings of the Burton Waterworks Company were held at the Swan Hotel, Lichfield and at the Queens Hotel, Birmingham.

The Directors under the Act were, Oscar Leslie Stephen, Richard Croft Chawner, John Robinson McClean, John Robson Warham and John Nuthall Brown. Warham was later replaced by Francis Stileman the business partner of McClean. Of these, Chawner was elected Chairman, replaced by Stephen in 1863. John P. Dyott was appointed Solicitor and Law Clerk.

The 20,000 one pound shares were allotted to: John Aird, £2,000; Richard Barrows, £4,000; Oscar Leslie Stephen, £2,000; Henry Allsopp, £2,000; John Robinson McClean, £3,500; Francis Croughton Stileman, £500; John Nuttall Brown, £500; Francis McClean, £500 and Richard Croft Chawner, £5,000.

At a half yearly meeting of the South Staffordshire Water Works Company, held in August 1861, the Secretary reported that the Bill for the supply of Burton on Trent had received the sanction of Parliament, under which Bill, this Company would be enabled to supply that large district from the Lichfield Reservoir.

McClellan and Stileman had designed the Burton scheme and mains were laid from the town to the Trent Valley Railway Station, with the intention of purchasing water from the South Staffordshire Waterworks Company. Negotiations had taken place for a bulk supply from Lichfield on the following terms. The Burton Waterworks Company to pay £500 per annum for 240,000 gallons per day, ascertained by meter, all beyond that quantity up to 480,000 gallons per day, to be paid for at a rate of three halfpence per thousand gallons. The accounts were to be made up and paid quarterly.

When the scheme proved inoperative, the Burton Company was incorporated with the South Staffordshire Waterworks Company by the 1864 Act of Parliament, which Act included the powers vested in the Burton Act of 1861. No payment in cash was ever made to the Burton Company for purchase, a simple transfer took place from one company to the other. The debts, liabilities and engagements incurred by the Burton Waterworks, viz. £3,000 for the Parliamentary Bill and the work in hand at the time of the transfer, were paid by the South Staffordshire Company by the issue of shares to the contractors, John Aird and Son and Richard Barrows and by debenture stock to the promoters of the Burton Company. Those shares were given in lieu of cash, the total amount expended was £20,991-2-10, Aird's account was for £4,625 and Barrows £1,295, the other liabilities were made up of Secretary's salary, £65-4s-0d, Secretary's compensation, £210, Solicitor, £116, Seal and furniture, £10-2s-6d, Stationary, £9-16s-4d and Interest, £5. The resolution confirming the sale and conveyance of the Burton Undertaking was resolved at a meeting between the two parties held at 179, Horninglow Street, Burton on Trent on Saturday 4th June 1864.

In 1876, T.N. Whitehead, Clerk to the Burton Council wrote to the Company to say the Commissioners were desirous of a proper and efficient supply of water to be made available to the populous parts of the district for the use of the inhabitants. There still remained approximately six miles of streets into which the Company's mains did not extend. The Commissioners were therefore disposed to acquire the rights of supply. He asked if the Company would feel inclined to sell and transfer to the Commissioners their property rights and privileges in Burton on Trent, which included the parishes of Branstone, Winshill and Stapenhill and if so, on what terms. The annual gross revenue from the town at that time was £5,800. Mains had been laid in Shrobnall Road, Duke Street, Hawkins Lane, Moor Street, Dale Street, Albert Road, Derby Street, Victoria Road and Bond End during the years 1869-1873. Considering this fact, a figure of £37,000 was mentioned as the asking price. The Company knew that a reservoir would be required in the near future to supply the town, no doubt this information leaked to the Commissioners, the town did not purchase the rights.

Tamworth's water supply.

Rural areas were consistently requesting supplies from large authorities but lack of finance to extend mains and the poor return to be expected from water charges, resulted in these communities having to provide their own small works.

One of these towns was Tamworth and it was many years before the works were taken over by South Staffordshire Water Works Company.

Tamworth's lack of an efficient water supply, as other South Staffordshire places, was mentioned at the inquiry into the sanitary conditions of the town in 1852, following a series of epidemics and a consequent high rate of mortality, which was once again due to the insufficient supply of water and contamination of wells. The majority of the ratepayers seemed content to continue using their polluted shallow wells and were financially opposed to any scheme for the betterment of the community at large, considering that it would result in an increase of rates. A small section of the inhabitants, chief among them Mr. S. Spruce, Dr. J.F. Woody and Mr. Charles Canning, realised that a supply of pure water was essential from a health point of view, and this group strived for years overcoming many obstacles and organised opposition, until their objective was achieved.

John Francis Woody wrote a strong letter to the Mayor of Tamworth, William Knight on the subject of sanitary measures of the town. He feared that the wise resolution of the Corporation to adopt measures to improve the situation was in danger of being overruled, owing to the clamour and pressure of the selfish and the ignorant. He wrote, "For private reasons and unworthy objects, opposition has been directed against the measures from a powerful quarter. The Nestor of the Corporation, possibly under instructions, who previously fought valiantly for the sanitary reforms, have bolted from the course in which he would have gained the respect of his fellow burgesses. Respectable men were ejected from the Corporation by the means and by the agents, law, land, and other, bad and indifferent, of a powerful proprietor. Clamour and ignorance, being in full sway, the timid in the Corporation were frightened out of their judgement". He concluded his letter " You yourself, Mr. Mayor took fright, and the Corporation in conclave decided that the sanitary measures, of a perfect system of sewerage and water supply, previously unanimously resolved upon, should be adjourned sine die. How short lived has been the rule of selfishness, of clamour, and of ignorance". Referring to the Sanitary Act of 1866, he said, " there is no escape and the town must put its house in order. Instead of option they had obligation and instead of the will and pleasure of the Town Councillors, they had the law of the land. The Act is to the Tamworth Corporation what Mr. Bovourie said a Reform Bill was to the Tories, a tremendous stick to thrash them with". Dr. Woody asked the Mayor to raise the sanitary subject at the next meeting of the Local Board.

The Sanitary Act of 1866 made obligatory the provision of good sewerage and water supply systems by Local Boards and not as previously, optional.

The history of an organised water scheme in Tamworth started when a large supply of water was encountered whilst sinking the shafts at Amington Colliery in 1863/64. Various suggestions were made to utilise the find, to supply the area, but it found little support. The following year other schemes were brought to the attention of the inhabitants. Water from Bourne Brook, and the River Anker near the Railway Station, was to be pumped up to the Spitals, Ashby Road, filtered and then distributed by gravitation on to the area, both schemes fell through.

Tamworth had been included in the area to be supplied by the Company, owing to its remote location from the Lichfield works this intention was cancelled, the Tamworth Authority not agreeing to pay a share, in what they considered a high cost, of laying mains.

In February 1873 the Board of Guardians, acting as the Rural Sanitary Authority, delegated its powers to a Committee to provide an organised supply. Negotiations were again opened with the Company but the conditions under which they were willing to supply were unacceptable. It was estimated by William Vawdry that £26,000 needed to be expended to provide mains and works to supply the town. A borehole was sunk, on the orders of the Committee, to a depth of 82 feet in the Keuper Sandstone, overlain by the river gravel of the Anker, at Moor Farm, Bolehall, one mile north east of Tamworth, but a chemical analysis of the water, proved that it was not suitable for a public supply, saline rendered it useless. Two years later at Bolehall, on the south side of Tamworth near to the Midland Railway Viaduct, a borehole was put down in land then occupied by H.Cope. The work was carried out by A.Smith & Sons, Boring Contractors of Smethwick, under the engineering supervision of Samuel Spruce. The cost of the 189 feet boring was £72-16s-0d. Work commenced on January 30th and was completed by May 7th 1875. An analysis of the water brought disappointment as the sample did not reach the standard of chemical purity for domestic use.

A further application was made to the Company who were still disinclined to afford a supply, although the War Office were also expected to request a supply for contemplated barracks at a site three miles from Tamworth, which would have provided increased revenue. The Company's nearest mains were at Lichfield, six miles distant and in order to bring water to Tamworth, a large main was required, this having to be laid through agricultural country producing no revenue. Following extreme pressure by the Tamworth Committee, the Company relinquished their powers to supply the district and the Committee of the Rural Sanitary Authority immediately took steps to obtain their own supply.

Henry Marten was requested to report to the Authority as to the best mode of supplying Bolehall, Glascote, Fazeley and Wilncote with water, his report was submitted in July 1878.

The first point to come under Marten's consideration was the source from which the supply was to be obtained. He questioned whether a supply of pure water could be obtained in a mining area such as Tamworth. Some of the sources of supply appeared to be both ample in quantity and fairly good in quality, but with active mining operations taking place around the prospective sites, none of these attributes could be guaranteed. These sources were disregarded because it was doubtful if the Local Government Board would sanction a loan for the execution of the works, when the principal supply was subject to mining contingencies.

In all, samples from twenty two sites were taken and analysed by the Public Analyst of Wolverhampton, Mr. E.W.T. Jones F.C.S. At the first site, the Tame and Anker Valleys, an extensive series of experimental test borings were carried out in the drift formation, by Messrs Legrand and Sutcliffe by means of their Abyssinian tube wells method.

This water from the "Staffordshire" and "Warwickshire" Moors was not recommended and water from test wells at Coton, although first class, was not considered adequate.

Other sites where samples were taken were: the rising main of Union Workhouse, a spring on the estate of Mr Neville at Haselour, a well at Hunts Hill, Mr.T. Johnson's well at Hopwas, at Bole Hall, springs at Hopwas Wood, Woodhouse Well, Hopwas Toll Gate Well and Griffin Springs. Samples were also taken from the Coventry Canal at Hopwas, Crane Brook, the River Tame, Hammerwich Water and Bourne Brook. It was not intended to use canal or river water but samples were taken just to ascertain whether the composition of the water, was similar to that available in adjoining springs.

Following this searching investigation, in which he was ably assisted by Mr Samuel Spruce, Marten considered the sample derived from the well sunk in the Rock at Hopwas Toll Gate much superior to any of the others for a town supply, and he recommended this source to be developed. He proposed that a convenient plot of land should be obtained near to this site and a deep well and borehole should be sunk, with power if necessary, to drive adits from it in various directions for the purpose of making lodge room and of opening out the underground springs. Marten recommended that a pumping engine should be erected at Hopwas to lift the water to the surface, and to force it through a main pipe to be laid along the Lichfield Road, through the town, along Lichfield Street, Church Street, Colehill Street and Bolebridge to a reservoir to be constructed on Glascote Hill, a spot of sufficient elevation to command the whole of the district. He proposed to lay supply mains en route. The balance of pumping over demand during the day was to replenish Glascote Reservoir, from where, after pumping stopped at night, the water would gravitate onto the district.

At the time of this report the number of houses in the Rural District was 1,422, and in the Urban District 1,090, which represented a population of 12,590. Marten thought a consumption of 314,000 gallons a day was a realistic figure. The estimated cost of the works, including land, well, borehole, pumping stations, principal and subsidiary mains, sluices, fire cocks and covered reservoir, together with preliminary expenses, engineering and extras, if laid out for the supply of both the Rural and Urban Districts, would be about £15,000 and if solely laid for the supply of the Rural District, would be £10,000. Marten further proposed that the water should be supplied on the constant system and that it should be stored in a covered reservoir, so that the water should not see daylight until it was drawn out of the taps in the consumers' houses, ensuring that it would always be fresh and pure.

A site at Hopwas was acquired and a complete scheme designed. In November 1878 the Tamworth Urban Council decided to join the Rural Sanitary Authority in the scheme, and the Waterworks Joint Committee was thus formed. The ceremony of digging the first sod at the well site was performed by Mr. Samuel Spruce and Dr. H.J. Fausset, Medical Officer of Health, on April 30th, 1879.

The contract for the well sinking was signed in May 1879. Sinking commenced the same month, under the superintendence of Henry Martin and Samuel Spruce. It was described in a report to the British Association in 1882. The well was 10 feet in diameter and brick lined to a depth of 162 feet. A two and a half inch borehole drilled in advance of the well while it was sunk, yielded no water down to a depth of 168 feet, and a shot was fired in the hard marl at this depth, which resulted in an inrush of water which rose to a level of over thirty three feet from the well bottom, this was on September 12th, 1879. In the same month a continuous pumping test for eight weeks gave a yield of one million gallons a day. Now that a supply had been secured the work of installing engines and pumps, the building of engine house and reservoir, and main laying went forward rapidly. A supply was afforded to consumers in Tamworth from July 1881.

Sale of early plant.

While the early works of the South Staffordshire Water Works Company were being carried out, two yards or stores were rented in Lichfield at Beacon Street and Wheel Lane. An appreciation of the plant in use in the early construction work of the Company is available from a catalogue of the first sale, held at these premises in the city. Catalogues were sent to railway contractors, engineers, colliery proprietors and farmers by Auctioneer H. Farrington when a sale of valuable plant took place at these yards in December 1866. Auctioned, was equipment used in constructing the tunnels, including five portable steam engines by Clayton, Shuttleworth & Company, an egg ended boiler, a Cornish boiler, six sets of pumps, four hundred yards of short link chain and blocks, twenty five tons of bridge rail, wrought iron air pipes, iron and wooden bows, two gins, iron dans or trolleys, ventilating fans, lashing chains, single purchase four ton crabs, driving gear and six wooden sheds, in all one hundred and sixty one lots. Luncheon was served to the early arrivals at 10.30am. Gross amount realised by the sale per the auctioneers account was £1,376- 8s.-0d., refreshments were provided at a cost of £37-18s.-6d.

Death of S.H. Blackwell.

Samuel Holden Blackwell J.P., who had played an important role in forming and establishing the Company, died in March 1868 at the comparatively early age of 52 years, having been born in Worcester in 1816. He held a high position among the iron manufactures of the Midland District, and was highly respected as a coal owner, ironmaster and mining engineer, owning or leasing coal mines at Dudley and Kingswinford. S.H. Blackwell had contributed considerably to the development and improvements in the iron and coal trade. For many years he took a prominent part in all the public proceedings affecting the welfare of the Dudley area being an original and active member of the Board of Health, who was concerned about the welfare of the working class, realising that with a good water system, many of the ills of the day would disappear.

Blackwell served as a Director of the Company from its inception until financial problems brought his resignation on April 24th 1857. Many of Blackwell's speculations turned out unfortunate, an adverse turn took place in the iron trade, compelling him to suspend his numerous operations. As a businessman he became unsuccessful as is shown by the closing down of a the Birmingham Banking Company's Dudley branch. It was due to losses by this branch, owing to the depression in the iron trade, that its stability was ultimately undermined. The bank's transactions with Blackwell and Company, against whom a debt of £69,430 was entered on their balance sheet, was later to exceed £83,000. Early in 1860 the directors of the bank accepted an estate of £40,000 in part payment of the debt. The bank manager at Dudley allowed S.H. Blackwell to withdraw money on unacceptable draughts which amounted to £42,000. In the same year he petitioned for a private enactment under the Court of Bankruptcy. S.H. Blackwell was of charitable disposition, respected by all who came into contact with him but unfortunate in his efforts and speculation.

Increase on revenue account.

20,000 houses were in supply by 1869, and revenue from domestic use was increasing although supplies by meter decreased and receipts from this source diminished, this was ascribed solely to continued stagnation of trade throughout the district although the number of trade consumers had increased.

Death of the First Chairman.

The 1870s commenced on a sad note with the announcement of the death of the Company's first Chairman, Richard C. Chawner at his home The Abnalls, near Lichfield on 12th. September 1870. He was a person who devoted himself zealously to the Company's interests. R.C. Chawner was born in 1804, the twentieth of twenty seven children of Rupert Chawner, a doctor formerly of Burton on Trent. For many years he took an active part in many public movements and business interests in Staffordshire, his main interest being farming. For a number of years he was a member of the Council of Birmingham Cattle and Poultry Show and First President of the Midland Farmers' Club. He served as a Deputy Lieutenant of the County and as an active Magistrate in Staffordshire and Lichfield. At the General Election two years previously, he stood as a Liberal candidate for Stafford and was defeated by seventeen votes. This election however was declared void on petition. Richard Chandler Chawner was interred at Burntwood.

Election of the Second Chairman.

At a Board Meeting held on the 23rd February 1871, Sampson Lloyd was named as Chawner's successor as Chairman.

At the same meeting, the resignation of John Robinson McClean was reported, due in no small part to his failing health. The number of Directors was reduced from nine to seven, as allowed for in section twelve of the 1853 Act of Parliament.

Shavers End Reservoir at Dudley.

Two explanations are put forward for the unusual name of the district of Dudley, known as Shavers End. It was said that the place was named from its extreme bleakness, piercing winds blowing across the ridge almost shaving one. The other theory put forward relates to a parcel of land called the "Lawyers Piece" formerly occupied by the Willington family, which lay between the old Workhouse and Eve Hill. A house sited on the land, was occupied by a lawyer, who during his lifetime was regarded as being particularly sharp in his profession. After his death the area was, with true Black Country wit, dubbed Shavers End.

Shavers End No. 1 Reservoir situated in Limepit Lane, lies unseen, overshadowed today by one of Dudley's landmarks the No. 2 Reservoir sited opposite. The earthen embankment type construction, with internal and external slopes, was built by Dudley Waterworks Company between 1835 and 1836 and is the oldest reservoir in the Black Country. Considerable research has failed to trace the name of the contractors involved in building the receptacle, but this type of construction, was, in this era, built by sub contractors, ninety per cent unskilled labour, equipped with pick, shovel and wheelbarrow.

In February 1835, Dudley Waterworks Company placed notices in local newspapers, requesting tenders for excavating and embanking two reservoirs, one in the Coseley area the other at Shavers End. The advertisement stated; "Specifications and plans can be seen the offices of Mr. Rofe, Civil Engineer, 18 Newhall Street, Birmingham. A person will be attending on the spot at each place to point out the ground and explain the levels etc., on the 19th and 20th of February from 12 o'clock to 2 o'clock each day".

Ground for the works at Shavers End, was provided by The Earl of Dudley. On completion the uncovered receptacle, rectangular in plan, measured two hundred and seventy feet by one hundred and ninety six feet. Covering an area of two acres, seven poles, the reservoir had a capacity of three million gallons at top water level. Whilst excavations were being carried out in Parkes Hall Road, Dudley, on 29th of October 1964, a short piece of main which originally supplied the reservoir from Ashfield was exposed. It bore the date 1835 which had been stamped on the collar of the pipe, a practice the manufacturers were compelled to carry out. Still in use at that time, the main was described as being in remarkably good condition considering its age. It was made of cold blast iron, a metal which was flint hard and difficult to cut or drill.

The Dudley Company was unable to produce a title to the land on which the reservoir was built when it was taken over in 1862.

On the 1st of November 1861 an agreement and a conveyance were presented to the Earl of Dudley by Dudley Waterworks and South Staffordshire Waterworks Companies for execution by his Lordship. He refused to sign either document until the claims of his Lordship and his Trustees, in reference to an agreement made with Dudley Waterworks Company in 1835, had been settled. It was found that no moneys had ever been handed over. In order for the Company to proceed with its works at the reservoir it was agreed with the Trustees that a payment of £2,000 should be made into their bank, this was deemed sufficient to cover the valuation.

Two agreements exist;

No. 1 agreement, made 1st November 1861, between The Right Honourable William Earl of Dudley, The Reverend Thomas Leigh Claughton, Clerk Vicar of Kidderminster and The Reverend David Melville, Clerk Rector of Great Witley as trustees of the will of John William, Earl of Dudley.

No. 2 agreement dated 9th May 1862, between William Chrysaston Wood, grocer and Richard Harvey Smith, who were two of the directors of Dudley Waterworks Company, in the first part, and the South Staffordshire Waterworks Company in the second part.

In October 1863, the Dudley Waterworks Company paid the purchase money with an arrear of over twenty years interest to his Lordship and the Trustees of the late Earl's will for the Parkes Hall and Shavers End Reservoirs.

On acquisition the reservoir was reconstructed and enlarged, increasing its capacity to five million gallons. The inside of the reservoir was sealed with puddled clay, eighteen inches thick. Walsall contractor John Boys Ltd. carried out the work at a cost of £766. 4s. 8d. John Boys Ltd. was recalled to carry out repairs in 1863 when a slip was found to be developing in the outer slopes of the embankment, this work cost £428.6s.1d.

By this time the water supply to the reservoir was being received from the Lichfield district. Water was gravitated to the surrounding districts of Dudley, Cradley and Brierley Hill. There was little cause for complaint from consumers, many receiving a supply of water on tap for the first time.

During April 1870 the Shavers End Reservoir at Dudley was cleaned out following numerous complaints of filthy water. It was found to be in a dirty condition, nearly one hundred and eighty tons of mud having to be removed from the bottom and sides. The banks of the receptacle were by far the dirtiest part, being almost covered with small crustaceans or fresh water shrimps and clay worms, fish were also present. A layer of lime was spread over the area which was afterwards slacked. Loose stones on the banks were carefully picked over, sprinkled with lime, and replaced, the lime then being raked in.

As a result the reservoir water was described as beautifully bright. Entire cost of the operation including labour, lime, hire of planks and wheelbarrows etc., amounted to forty pounds

On June 25th 1870 one of the banks of the reservoir slipped and it was necessary to run to waste all the water in the receptacle so that repairs could be effected. Numerous complaints were received from consumers about dirty and undrinkable water. On its journey from Lichfield to Dudley, water was discharged into another uncovered reservoir at Tipton, from where it was repumped to Shavers End. This use of open reservoirs in industrial areas resulted in the cause for complaints of impure water.

A letter in the Dudley Herald dated June 1875 read;

"Can nothing be done to induce the South Staffordshire Waterworks Company to send me a supply of water which is not positively offensive. The water from my tap this week has been really unfit to drink and its smell is abominable. I hope the town council will act on this matter otherwise the mortality will be something frightful".

Two strips of land were purchased in the 1870s for the protection of the embankments at Shavers End. An area of land, two and a half poles from the Lord Bishop of Rochester for ten pounds and a similar piece of ground from Whitehouse, Hill and Rollason for sixteen pounds.

Frederick Brown the Reservoir Keeper reported in 1878 that sea gulls had landed on the receptacle, very soon after four men, appeared with guns and dogs. Following the shooting of a gull, a dog was sent into the reservoir to retrieve the dead bird. The Engineer asked for the men, Henry Hoskins, William Cole, Frank Sparks and Quilter Willetts to be summoned.

During the 1890s the reservoir was subject to an algae growth which covered the water surface. The Company purchased an eighteen foot punt which was used by the watermen to travel to and fro across the reservoir, enabling them to scrape off the scum lying on top of the water. Fish were plentiful but fishing was not allowed except to a select few.

A reconstruction of the reservoir was commenced in January 1903 and the work was completed in eight months by George Law of Kidderminster who carried out the contract at a cost of £4,800. Work of reconstruction consisted of stripping the sides of the reservoir of bricks and rubble, levelling the puddle on the sides and bottom, prior to the sides being covered with nine inches of concrete, then lined with common three inch blue Staffordshire bricks obtained from The Earl of Dudley's Coneygre yard. Twelve inches of concrete covered the base of the reservoir. Both the original inlet and outlet pipes were rearranged and enlarged from nine inches to twenty inches diameter.

The cover to the reservoir was commenced in November 1905 and consisted of concrete arches, six inches thick on crown, and twelve inches thick at haunches, carried on rolled steel joists, ten inches by five inches. These joists were carried on cross walls with arches springing from one hundred and seventy six piers, two feet three inches square. The bases were formed on the top surface of the new concrete lining and the whole of the top surface was covered with soil, six inches thick.

Whilst the brick arches were being constructed in January 1906, an accident occurred. Without any warning the scaffolding collapsed and twelve workmen were precipitated to the ground, a distance of twenty feet on to a heap of bricks. Two men were badly injured and were taken to the Dudley Guest Hospital.

Zeppelin raids over the Black Country in 1915, induced the Company to allow a Mr. Newey to use the site as an observation post, where he erected a hut as a guard room.

The Shavers End No. 1 Reservoir was taken from service in November 1981 as a precautionary measure. An inspection of the structures revealed cracks in the brick arches and concrete roof which had deteriorated since the previous inspection. A detailed site investigation has been undertaken but the reservoir will remain out of service until the remedial measures have been determined and carried out, ensuring that it is fit for service once again.

The West Bromwich, Oldbury and Smethwick Water Bill.

Several local dignitaries of West Bromwich, Oldbury and Smethwick, not satisfied with the level of service provided by the South Staffordshire Waterworks Company, met and discussed the possibilities of setting up a local water unit to satisfy the inhabitants in the district, and to break down what they considered an oppressive monopoly. Local engineers Nichols and Humber, designed a scheme to utilise a cluster of eighteen to twenty springs rising in the Crosswells district of Oldbury, and flowing into the Moat Farm, the Crosswells Reservoirs, Basins Farm and Sandwell Reservoirs. Other water was available at Sandwell Colliery and springs supplying Thimblemill Reservoir.

Notice was given in November 1870 that an application was intended to be made to Parliament for leave to bring in a Bill to incorporate a Company to provide a water works to the immediate area. The Oldbury, Smethwick and West Bromwich Water Bill was brought before Parliament in 1871, with the intention of, quote, "better supplying with water, the parishes and Towns of Olbury, Halesown, Smethwick, Harbourne, Warley Salop and Warley Wigorn".

Among the subscribers to the company were, James Sadler of Jas Sadler & Sons, Brick Makers of Langley, William Stableford of Broadwell House, Oldbury, who was Manager of the Waggon Company, William Underhill, a Malster of Simpson Street, Oldbury, William James Kite, a Surgeon of High Street, West Bromwich, William Ward a Soap Manufacturer of High Street, West Bromwich, William Davis, a Doctor who practised in Smethwick, Thomas Bindley a Glue Maker of Smethwick, Henry Duncliffe a Surgeon of Sandwell Road, West Bromwich and Thomas Eyre Foakes.

The capital of the company was set at seventy thousand pounds in seven thousand shares of £10 each. There were forty seven sections to the Act submitted, including completion of work's within five years. Section 28 referred to water rates based on rateable value, with an extra closet supplied to cost four shillings per year, and eight shillings per annum for supplying a bath, which was limited to a capacity of fifty gallons, no water rate to be lower than ten shillings per annum, paid in advance.

The works planned were,

- 1 A storage basin or reservoir situated in Moat Meadow, Warley Wigorn, a field belonging to the representatives of the late Edward Monkton and in the occupation of Richard Powell, a dam or weir across the spring or stream to be constructed at a point where it passed under Moat Lane leading from Dog Kennel House to Bristnall Fields.
- 2 A storage reservoir or basin in Big Meadow belonging to the Trustees of the late Joseph Hall occupied by Timothy Thomson. This meadow was situated at the junction of Cross Wells Road and Dog Kennel Lane.
- 3 A storage basin or reservoir in Crosswells Meadow and partly in the Far Crosswells Meadow Field belonging to the late Joseph Hall and occupied by Timothy Thompson and William Underhill.
- 4 A storage basin or reservoir in a field, Middle Moor Black Meadow Hill Hole and partly in Hill Hole Field, once again the owners were the Trustees of the late Joseph Hall occupied by Samuel Underhill.
- 5 A reservoir upon the site of an existing mill reservoir or mill pond called Trimble Mill Pond, belonging to Joseph Shorthouse and occupied by John Burgess and Thomas Price.
- 6 A reservoir in a field called the Park, bounded by Thimble Mill Lane and a road leading to Warley Hall. The field was owned by John Dawes and occupied by Thomas Cooper.

- 7 A reservoir in a field belonging to the Earl of Dartmouth and occupied by the Sandwell Park Colliery Company Ltd. and John Rusker, which field was situated adjoining and near to the junction of the Great Western Railway Co. and the Stourbridge Extension Railway.
- 8 The eighth and final reservoir was planned on land belonging partly to the Earl of Dartmouth and George Benjamin Nichols and occupied by John Hall and lying between Thynne Street, Beeches Road, Herbert Street and Overend Street, West Bromwich.

A proposal was made to abstract water from the stream called the Crosswells Stream, the Langley Mill Stream, the Basins Farm Stream, and the Thimbermill Stream. A further proposal was made to divert into the intended reservoirs and aqueducts derivatively, water from the River Tame which river supplied with water an existing reservoir namely the reservoir belonging to the Birmingham Water Works Company situated in the parish of Aston near to Salford Bridge and called Aston Reservoir. The Oldbury, Smethwick and West Bromwich Water Bill was heard before the select Committee of the House of Lords on 22nd of March.

Main opposition to the scheme came from South Staffordshire and Birmingham Waterworks Companies, Messrs. Albright, Edward Wilson and Jacob Hort-Player and Messrs. Chance Bros. Birmingham Waterworks Company's objection to the Bill concerned the use of Crosswells Stream, in use as a standby supply to Birmingham and the inclusion of Harborne in the scheme, an area they held rights to supply. The promoters stated that Harborne had been included because Smethwick happened to be in the parish of Harborne. With the withdrawal of Harborne District except Smethwick from the Bill and the water rights of Crosswells stream allowed, Birmingham Waterworks objection was withdrawn. Albright and Wilson, and Chance and Son objections to the Bill centred around certain preferential rights over the Crosswells Stream and its tributaries. They were wholly dependant on this for their water supply, but withdrew opposition when clauses were inserted in the Bill, and agreed upon, to protect the rights.

Although a mains supply was available in Oldbury, the inhabitants were content to use the local sources of supply. Crosswell Spring at Oldbury provided a supply to local inhabitants up until the 1870s, situated in a field in the Crosswells Road / Bloxcidge Street vicinity, the supply was described as bubbling up within a small pool, from the pool ran a stream to Mill Pool. Walter Showell and Son established a brewery on the site in 1870 and utilised the water for their product, terminating use of the Crosswells Spring by the public.

Rounds Green Springs yielded an abundant supply and another source was a covered well at the corner of Fountain Lane at its junction with Bromford Lane. This was described as brick built, sporting a dome top, having an opening at the side, allowing access for a bucket to be lowered down on a short piece of rope to obtain water. Mine workings in the vicinity, point to this being an old water logged shaft.

Sanitary conditions of the three towns were totally unsatisfactory. The worst feature about West Bromwich was the surface drainage creating a health risk made worse by the propensity of many of the inhabitants to keep pigs. Many of the main thoroughfares without a water supply included New Street, Walsall Street, Puddingbag Street, Churchfields, Hill Top and Greets Green. Partial supplies were available in Spon Lane and Bromford Lane. Many of the smaller houses were wholly without water of any kind, the tenants resorted to begging for a supply from some distance away or get it from the canal. With the wells drying up in the summer a walk of a mile was not unusual in order to obtain water for drinking or cooking.

One correspondent's report on Oldbury concluded, "We now pass Park Street where we get our first sight of the brook. Is it not a libel on nature to call that which is a mere filthy ditch by any such pleasant name?".

In Todd Row pigs, putrescent privies and refuse heaps were to be found, water was laid on to three houses, six were without. Stone Street contained three nice houses, no tap water was laid on and the well water was quoted as "no better than clay water." Barrons Building in Stone Street housed two privies for six houses, doorless and one with no roof. There was no tap water, well water was available which was unfit to drink. The report continued, "Eel Street, like the creature half fish, half reptile, from which it takes its name, nestles in filth. There is nothing but foul pump water, similar conditions exist in West Bromwich Street, Newberry Lane, Colliers Row, Albert Street, Furnace Row and Park Lane".

Henry Haywood, a surgeon of Oldbury, gave evidence to the Committee admitting that the symtotic diseases that prevailed in the town were due to bad drainage and an insufficient water supply. As Medical Officer to the Local Board of Health he had frequently drawn the attention to the Board to the bad quality and insufficient quantity of water. In May 1867 he reported that there were sixty five houses, out of one hundred and thirty five in the neighbourhood, that had no supply of water from any source. Typhoid and scarlet fever prevailed to an extreme, in one court of twenty five dwellings, housing one hundred and ten people, no supply of water was available. Walter Showell, a brewer, complained that on Saturday nights there was a great shortage of supply. It was suggested that this was the night for a general wash in Oldbury, a statement which was greeted with much laughter. Dr Kite complained on behalf of the inhabitants of West Bromwich and referred to surface drains polluting the wells and a lack of a regular system of drainage.

Evidence for the South Staffordshire Water Works Company, who strongly opposed the Bill in Parliament, was given by Francis Croughton Stileman, a Consultant Engineer, who considered the proposed works badly designed which could not be executed for the money mentioned in the estimate of expenses. In his statement Stileman said the works involved the interception of five streams, all subject to mill owners' rights, the construction of eight reservoirs, the planning of at least three pumping stations and the laying of fifteen miles of pumping mains. It was impossible that these works could be constructed and compensation to mill owners paid within the engineer's certificate.

Stileman further stated that there was an insufficient supply of water available to satisfy the demand, 400,000 gallons per day was required to provide ten gallons per head of the population. Although the proposed Company had entered into a contract with the Sandwell Park Mining Company Ltd. to purchase from them, for the purpose of distribution, all the water they could raise from the mine, this source was purely conjectural and unreliable.

The poor of the districts were not better supplied due to the negligence of miserly landlords, loathe to expend money to get water to the dwellings

The verdict of the House of Commons Committee was delivered by Lord Penrhyn on 24th March 1871. The Committee had considered the case with great care and they were of the opinion that it was not expedient to proceed further with the Bill. At the same time the South Staffs Waterworks Company should take warning by what had happened and take such means as to provide a more substantial water supply. A bulk supply of water was made available from Birmingham Waterworks Company and is utilised up until the present day, but only to supply three factories and as a standby for emergencies.

Although a piped supply was available, the Board of Health gave authority for a well to be sunk to supply eight houses in Halford's Lane, Smethwick in August 1872. From 1875 the supply network was improved. A new twelve inch main was laid in West Bromwich and an eight inch main was laid from Halfords Lane to Ruck of Stones Lane, Smethwick. Up until this time Smethwick was supplied by a single six inch main laid along Spon Lane through to High Street with branches to South Street, Rolfe Street and Engine Street. This main was also in use as a service pipe, and in consequence, each time an additional connection or other work was carried out, the whole of the supply to Smethwick had to be shut off.

Supply difficulties of the 1870s.

Thirteen years on from the opening of the works much of the Company's apparatus was in need of an overhaul, being subject to continuous working, with little chance of augmenting any maintenance programme. Both the Boroughs of Smethwick and Dudley summoned the Company through the courts, for insufficient and unwholesome water supplies pursuant to contract. The Company was prevented by a number of unavoidable accidents to maintain a supply. Dudley's water supply was less than intermittent, breakdown of engines at Sandfields and a leakage at Walsall Reservoir were responsible.

The following are a few of the particulars from the logbook kept at Sandfields Pumping Station: -

June 11th 1870 Stopped at 6pm. to change bucket. No.1 engine resumed pumping at 10.50pm. At night stopped pumping at 2.30am. Walsall Reservoir leaking.

- June 12th Stopped pumping Walsall Reservoir leaking.
- June 13th. Resumed pumping
- June 15th. Stopped pumping from 11.45am. to 2pm. to put in joint clack door.
- June 19th. Breakage, one of the three pumps disabled, pumping power reduced one third. Pumped all day with two engines.
- June 20th. Stopped at 11.00am. to put on clack door, resumed pumping at 2.00pm.

The leak was discovered in the reservoir at Walsall on June 10th and a large part of the water contained in it was run off to waste, this amounted to twelve million gallons.

Later it was confirmed that a tree stump left in the original work had rotted, but this bad workmanship was denied by J. Boys the contractor. For two days the Company's principal mains were used in running off water and in consequence supplies to all districts suffered. Pumping was resumed on June 13th and between that date and June 30th. several other breakdowns were logged including repairs to clacks, changing buckets etc. One of the banks of Shavers End Reservoir slipped on June 25th and it became necessary to effect repairs. The supply to Dudley was given by continuous pumping from Coneygre Reservoir but this at its best was only a partial intermittent supply. The course of the water through the mains and the pressure in them, arising from the action of the Company's engines, always being liable to interference from prejudicial persons living in the higher parts of the town, by the draining of water from the mains at lower levels purposely. All these problems resulted in non supply in Dudley and Smethwick and the local authorities sought to recover damages from the Company. During this difficult time temporary supplies were afforded from Birmingham Waterworks.

William Vawdry reported to the Company's Board of Directors in August 1870. "The want of a better supply to the higher districts has been seriously felt during the past three months, the continued dry weather and consequent great demand has quite emptied the small stock of water we had in the Conygre and Dudley Reservoirs. Under the present system it is impossible to supply the higher districts. The deficiency of water has been attributed to the leak at Walsall, it is my duty to inform you this was not the cause, it was no doubt the means of bringing it about a day or two sooner. The Dudley Reservoir was almost empty a week before the mishap at Walsall Reservoir, and we had no water in Conygree Reservoir, indeed the only means of supply to Tipton, West Bromwich, Smethwick, Oldbury, Coseley, Gornal, Dudley, Netherton, Cradley and Brierley Hill was a twelve inch main from Wednesbury to Tipton". Vawdry's recommendations to improve the situation included, the use of the old Dudley Waterworks plant at Parkes Hall from where there was laid a nine inch main to the Dudley reservoir or the more satisfactory scheme to erect works at a point between Walsall and Wednesbury. The latter scheme was soon to be adopted.

Poor supply conditions existed in 1872/73, and at times the reservoirs were virtually empty. Fourteen stoppages of engines were logged for repairs, taking two hours for packing stuffing boxes, to twenty seven hours for replacing a plunger pin, other items included changing buckets and defective clacks. The courts were fairly lenient with the Company which escaped by paying court costs.

New pumping station at Wednesbury.

One of the most important extensions during this decade was the erection of an additional pumping station at Wood Green, Wednesbury on land purchased from Company Director, Richard Jesson. The first beam engine and boilers were supplied by James Watt and Company and erected in 1871. Beam engines Nrs. 2 & 3, together with boiler plant, were constructed by Harvey and Company of Hayle, Cornwall. The station was sited alongside the London North Western Railway line and a siding was provided to receive the coal to be used. For the privilege of three windows at the station, overlooking the railway, the Company paid the railway company a rent of 2s-0d per year.

The repumping plant, distributed water to the higher parts of the district, and was in constant use for thirty years, under very arduous conditions and this, coupled with the demand for an increased supply, made it essential to modernise the works.

In 1911, H. Ashton Hill replaced the plant, building new engine and boiler houses, installing a triple expansion rotative engine with force pumps and two high pressure Lancashire boilers with superheaters. The plant constructed by Galloways of Manchester, was capable of pumping four million gallons per day. With the increase in works, the Company decided to undertake all repairs to plant, independent of contractors, except the large machine work, in addition a central stores was necessary to deal with equipment and spares required at the various depots and stations. Up until this time, the main stores were situated at Tipton, if materials were required at Burton they had to be sent by train or by horse and cart.

The old beam engines at Wood Green were dismantled and the engine houses and boiler houses were utilised to provide the accommodation for these needs. The James Watt engine was dismantled in 1918 and the engine house was modified to form a workshop, the top floor being used as a pattern store. Electrically driven machine tools were installed in 1920 when the workshops were brought into commission.

Because of the prohibitive cost of a duplicate steam engine during this period, Sultzer Brothers were contracted to provide electrically driven centrifugal pumps consisting of three horizontal three stage pumps and the plant was brought into commission in 1920. In the same year, the two Harvey beam engines and five old boilers were dismantled. The engine house was then converted into the central stores, with an administration office.

Old pump rooms below were modified to form a garage and repair shop for the Company's cars and lorries and a blacksmith's shop was constructed on the railway side of the stores. An old boiler house was converted into a meter repair shop. Byelaws for the prevention, misuse and contamination of water provided that all fittings used in connection with the supply of water within the area, should be tested by and stamped by the Company and accordingly a fittings testing shop was set up.

In 1926 due to the high cost of electricity, a steam turbo alternator was installed. It was capable of a continuous output of 320 kilowatts, sufficient power for three pumps. An end to the pumping era at Wood Green came in 1975 with the completion of Walsall Booster Station. The premises sited in Brunswick Road were vacated in September 1981 and the site sold.

Additional plant at Lichfield.

William Vawdry had advised the Board of Directors to install a fourth engine at Sandfields Pumping Station. In August 1871, a tender for £5,820, submitted by Jonah and George Davies of Tipton for supplying and erecting a one hundred and fifty horse power beam engine was accepted. Responsibility for a building an extension added on to the original beam engine house, to accommodate the new engine, was accepted by the Company. This extension is the only building remaining today representing what is termed as the original works of the Company.

The whole of the work was planned to be completed in nine months but Messrs Davies ran into financial difficulties with the work still incomplete. Jonah and George Davies were declared bankrupt in January 1873 with liabilities of £8,700. Possession of the works were acquired and completed under the direction of William Vawdry. Work was not completed until late 1873 at an additional cost of £2,000, Messrs. Davies's workmen continued on site, the Company paying their wages.

This engine had a steam cylinder sixty five inches in diameter, the stroke being nine feet, worked from the beam was a ram and bucket pump. The bucket was 25.625 inches and the ram 17.175 inches in diameter by 9 foot stroke, and once developed 190 hp at seven strokes a minute, whilst pumping water at the rate of two million gallons per day with a delivery head of 355 feet on the force pump. A Tuscan arcade of three arches with fluted columns, supports the bearing for the beam. Messrs. Thornewill and Wareham of Burton on Trent provided and fixed the steel stairs and handrail in the three storey building, their tender at a sum per hundredweight for the work, as it was not possible to give a price for the whole of the equipment, as it was in so many small parts, amounted to £250.

Walsall's supply problems.

During 1873 a special meeting of the Walsall Town Council debated the water supply question to determine the steps to be taken to remedy the water shortage situation. The Clerk produced a document showing that a quarter of the inhabitants were totally unsupplied with the Company's water, one eighth imperfectly supplied and many partially supplied. With regard to the partial supply the Company were no doubt hiding behind the Clauses of their 1864 Act of Parliament which said the Company should not be bound to raise water above the level of their reservoir. It was proposed that the necessary proceedings be taken to enforce the Sanitary Acts for an adequate supply of water for the borough. The Walsall Free Press highlighted the situation in their Editorial Column stating that the people of Walsall very frequently found themselves in pretty much the same position as the ancient mariner when his stores of fresh water became exhausted, for although there are few towns so well supplied with springs, there are few where the water supply was so limited, and the cause of this was obvious.

When the South Staffordshire Waterworks Company undertook to supply the town with water, most of the public pumps were taken up, and landlords, finding it more convenient to purchase a supply of water from the Company than to sink wells, erected their dwelling houses without pumps. With the Company failing to furnish a regular and adequate supply of water, the inhabitants found themselves in the middle of summer with fever threatening them in every quarter through the waterworks company failing to discharge its duty. Many parties seeing the dilemma in which the patrons of the waterworks had found themselves in, were adopting the old system of sinking wells, but where houses had been erected, it was inconvenient to adopt the old method. The committee of the Cottage Hospital, having appealed in vain to the Company for a better supply of water for that institution, had commenced to re-open an old well which had been infilled, covered over, and a kitchen built over it. The Free Press were pleased to find that there was a prospect of a new company being formed for supplying Walsall with water.

The present Company, by extending their mains, and undertaking to supply places which by their Act they were not authorised to supply, had broken faith with the public of Walsall. Having failed to furnish an adequate supply of water, the people of Walsall should do for themselves what the South Staffordshire Water Works Company evidently cannot or will not do for them. The statement continued by stating, "Indeed for the Company to attempt opposition would be to repeat the conduct of the dog in the manger, who would neither eat the hay or let the ox eat it. Should a new company be formed, and we believe we have good authority for saying the subject is being seriously entertained by several of the leading men of the town, we have no doubt the affair would be taken up with spirit by the inhabitants generally. Nor would there be any difficulty experienced in finding sources whence adequate supplies of pure water could be procured. We were informed, when making some inquiries upon this subject a few days ago, by a gentleman well acquainted with the locality, that near to the site selected for the new cemetery at Bloxwich, is a spring of water capable of supplying the whole of Walsall and Bloxwich.

Whether that source would furnish an adequate supply or not, there can be no doubt plenty could be procured from the Hednesford Hills whence the water could be conveyed to Walsall upon the gravitation principle, thereby doing away with the expense and contingencies connected with pumping. It is to be hoped the gentlemen who have turned their attention to this subject will mature their plans, and be in a position shortly to place their scheme before the public who, we have no doubt will take the matter in a spirited manner, for one of the greatest wants of Walsall is a plentiful supply of pure water". The article concluded by stating that they were pleased to find, that since the above was written, the subject had been brought to the attention of the Town Council and a committee appointed to inquire into the best sources of supply, but it was feared that the Council at that time, was not in a position to enter upon such an undertaking as the supplying of the town with water. If a company was formed a clause should be inserted in the articles of the association, giving the Town Council power, when it was in a position to do so, to purchase the water works by repaying the capital expended. They had always advocated the possession, by town councils and other sanitary authorities, of a plentiful supply of water to be used by them ad libitum for sanitary purposes such as the flushing of gutters and sewers. The Councils had to pay for the water used for flushing purposes subsequently they were economical in the use of water. With the commissioning of the new engine at Sandfields in 1873, the supply position eased and the idea of a new water company at Walsall was dropped.

Temporary water supplies obtained.

William Vawdry reported to the Chairman and Directors in July 1874 on the state of the water supply at Lichfield, brought about by the exceptionally dry summer. The stock of water in Stowe Reservoir had seriously diminished only being sufficient, at the rate of consumption at that time, to last two weeks. He stated, "Something must be immediately decided upon to meet the greatly increased demand or steps taken for reducing the consumption. The question of providing an additional quantity of water is I trust only one of cost". Vawdry suggested that arrangements be made with the miller at Seedy Mill, a Mr Hall, to have full control over the workings of the mill in payment of £80 for the year. This payment would allow the Company to have full control over the flood gates to so regulate the flow of water down the stream allowing the whole to be taken when it was necessary.

Vawdry stated that half way between Lichfield and Burton on Trent there was an abandoned rolling mill fed by water from the River Trent, if arrangements could be made with the owner of the mill, water could be taken for use, on a temporary basis by the Company, for the supply of Burton on Trent. Wichnor Mill was owned by Colonel Levett of Smallwood Manor, Uttoxeter, and his charge for the mill on a yearly basis was £200. Inserted in the provision was a right of way from the railway station through a field to the forge for conveyance of plant etc. Three hundred yards of main was laid on the surface of the ground and a connection made to the main to Burton. At the forge end was fixed a small steam engine. This water had to be filtered prior to use, the method was not stated.

Death of a Chairman and the beginning of the Frank James era.

Frank James was called upon to chair his first meeting of the Company in August 1874. This was at the request of Sampson Lloyd who remarked that he was from illness, quite incapable of discharging the duties himself. In moving the adoption of the report, Mr James said he should not waste time in any unnecessary apology for occupying the position he was called upon to fill, although Mr. Lloyd was suffering from a severe accident, his interest in the Company was so strong, that he had come out for the purpose of putting in an appearance before the shareholders. He earnestly wished that Mr. Lloyd would soon recover from his accident and continue his valuable services he had so long a time rendered to the Company, this was not to be.

A further change of Chairman occurred in 1874, brought about by the death of Sampson Lloyd, at his home Areley House, Stourport, on 26th August 1874. He was described by his colleagues as an intelligent, assiduous and urbane Chairman. He was born in 1808 at the Farm, Sparkbrook, Birmingham, the residence of his father Samuel Lloyd, a banker, of the firm Taylor and Lloyd, the founders of Lloyds Bank Limited. In 1835 he joined his brother Samuel and his two cousins, Joseph and Samuel Foster, in the business of Lloyds, Foster and Company, Old Park Works, Wednesbury, which had been founded in 1815. He replaced his brother, George Braithwaite Lloyd the father of Sampson Samuel Lloyd, M.P., who henceforth devoted himself to the banking business in Birmingham. Sampson Lloyd applied himself to an engineering career and superintended the department with a highly skilful and business like aptitude. The concern grew in magnitude and reputation until it became of world wide renown, trading and supplying the wants of the various railways, then in course of construction, commencing with the manufacture of wheels and axles, turntables, switches, and railway material of all kinds.

In 1862 his partner, Samuel Lloyd died and in 1867 the company was absorbed into Patent Shaft and Axle-Tree Company and Lloyd was chosen as vice chairman a post he held until his death. He was also a Chairman of the Darlaston Iron and Steel Company. Although born a member of the Society of Friends, he joined in later life the Church of England, and was a churchwarden at Hagley Church, when residing at Wassel Grove, near Stourbridge and later occupied a similar post at Areley. He was respected by all, rich or poor. It was stated that he was always approachable and easy of access, no flunkeys to guard the office door, no one in the Black Country ever did or would say one word against him, his "'yea" was "yea", and his "nay was "nay". He was described as gentlemanly, kindly, truly one of nature's noblemen. Politically he was a Liberal and when a resident of Wednesbury took an active part in public affairs and was for some years, Chairman of the Local Board promoting the social, moral, intellectual and material welfare of the town. Lloyd acted in a capacity as Magistrate for the counties of South Staffordshire and East Worcestershire.

First choice for the position of Chairman was Richard Jesson but he declined the nomination. Frank James was elected in his stead, beginning a thirty five year term of office during which time he rendered valued and important leadership in the Company's affairs.

Dr. Ballard's sanitary report of Dudley.

Inspections of the sanitary conditions of many Black Country towns were carried out in 1874. The inspection of the Borough of Dudley was carried out by Dr. Ballard, who ultimately issued his report to the Local Government Board. His report covered several points including; the high death rate, unwholesome conditions of the town, lack of sewers, neglect of excrement removal, overcrowding of houses, the unwholesome condition of well waters with which many houses were supplied and the insufficiency in quality and the turbidity of the supply given by the South Staffordshire Waterworks Company.

Of the houses in Dudley Town supplied with water, twenty per cent derived their supplies from local wells. Complaints were made stating that the water was unfit for use apart from slopping. Inhabitants of houses thus supplied made no secret of the fact that when the opportunity came, they stole water from taps of neighbouring properties.

Reference was made to an enquiry carried out by H. Burton the Inspector of Nuisances in 1871, into the water supply of Dudley so far as it related to the sources of supply;

Inhabited Houses

District	S.S.W.W.	Supply Pump or Well	No Supply	Total Inquired
		Into		
Dudley	3,680	922	100	4,702
Netherton	1,059	745	395	2,199
Woodside	370	487	37	894
Kates Hill & Dixons Green	295	798	56	1,113

There were in the town, three public drinking fountains supplied by the South Staffordshire Waterworks Company, in the Market Place, Birmingham Road and at Queens Cross, a fourth fountain existed at Eve Hill, and in addition a few public pump wells. Windmill End, Netherton possessed a water supply, a superficial well for a number of cottages, holding water only three feet below the highway level, and people travelled miles to collect a supply from here. In times of heavy rain, surplus water from the highway found its way into the well.

H. Burton was Chief Superintendent of Dudley Police, in 1874 he sent a communication to the Dudley Water Supply Committee referring to the supply at the police wells in the station yard. An analysis of the water by the County Analyst Mr. R. Davies showed the sample to be grossly contaminated by highly injurious organic matter, doubtless diluted sewage. Water from the well was in constant use by the police staff and families. There was a division of the members of the Council Committee to apply for a supply from South Staffordshire Waterworks Company until an estimated cost had been obtained.

Referring to correspondence he had had with H. Haselden the Secretary of the water company, Dr. Ballard agreed that the Company's water, notwithstanding occasional turbidity, was free from suspicion of dangerous quality, while there was reason to believe that the well waters were dangerously polluted. The Directors of the Company had made a formal offer to supply water to small houses rated below six pounds annual rateable value for twopence per week. On the books in the parish of Dudley, no fewer than 1,706 houses were supplied of those with a rateable value less than six pounds and 1,230 of the same class not supplied. Dr. Ballard concluded his report; The Council should be required to provide for all parts of its district a supply of wholesome water. It should enter into a contract with the Company for a supply of water necessary for the purposes of the Public Health Acts and to provide, at the public expense, any number of new waterworks, such as public standpipes would be, for the gratuitous use of any persons to carry away, the same for their own private use.

The 1875 Act of Parliament to provide for works at Cannock and Rowley.

As the Company developed its area of supply, the growing requirements of the district made it necessary to seek new sources of supply. The sources of supply at Lichfield were completely absorbed by the existing consumers and no extension in demand could be complied with from these sources. Added to this, the capacity of the Lichfield main was nearly exhausted by the districts requirements. At this time, trial sinkings for coal were being made at Huntington and Hednesford. The volume of water liberated, materially interfered with coal mining operations, these waters were analysed and finding them to be suitable for domestic consumption, it was decided by the Board to promote a Bill in Parliament to finance the venture to develop the source. Notices advertising the application to Parliament for the Bill appeared in the London Gazette on 20th November 1874. Details were submitted to Shareholders in February and June 1875. In Parliament, opposition was received in Committee from eight Local Boards and by landowners in the vicinity of the site.

The Directors were surprised at the opposition of the Local Boards because the Bill could not injure and must benefit the inhabitants, nevertheless as the Parliamentary Committee in two cases granted certain concessions to certain Local Boards, the Company bowed to their decision as regards those particular Boards of Health, accepting without opposition the conditions under which Parliament consented to the passing of the Act. In the instance of Walsall a provision for high level water pressure was inserted in the Bill, by which the Company would be bound to give constant service at the highest points of the town but as the Company had this in view in planning their new works, the clause in the Act making it obligatory was not very onerous. The same remark applied to a clause requiring the undertaking to lay a main to Bloxwich. In the cases of Sedgley and Tipton the inserted clause referred to water charges.

The 1875 Act of Parliament received the Royal Assent on 2nd of August 1875 providing for the construction of two pumping stations and a large storage reservoir, allowing £200,000 share and £50,000 loan capital.

Huntington and Moors Gorse were the pumping stations, the reservoir was at Hednesford. Under the new Act the Company obtained powers over sources of supply better than those at Lichfield as to quality of water and calculated to yield a far larger quantity. The whole of the Cannock Chase area of at least 36 square miles, formed the collecting ground of the water percolating through a natural filtering bed of pebbles and gravel, what the geologist called conglomerate and resting on the impermeable clay underneath, forming an immense storage reservoir from which water could be pumped for use through shafts sunk perpendicularly or through tunnels or adits. The locality was considered favourable in other respects. It was virgin soil as regards water company operations, for there were no vested rights, payments to landowners were not heavy although a fair valuation was paid and the distance from the locality of supply was not great, ten miles from Walsall and twelve and a half miles from Wood Green Pumping Station.

The Directors organised the inaugural ceremony at Moors Gorse and Huntington Pumping Stations on a most expensive scale on 21st of July 1880. Invitations were sent to the Mayor of Birmingham, the chairmen of various local authorities in the district of supply, sanitary engineers and a large number of influential gentlemen. A special train was chartered to convey the company from New Street Station Birmingham to Cannock, Mr. Sutton the Superintendent of Traffic, L.N.W Railway, personally taking charge of the train. At Cannock Station six large brakes, each drawn by four handsome grey horses, were waiting to convey the party to the sites, to witness Chairman Frank James carry out the opening ceremony.

William Vawdry had prepared the necessary plans and specifications for Huntington Pumping Station. E. Timmins, of Bridgewater Foundry, Runcorn, had been awarded the contract for sinking the well which was originally sixteen feet six inches in diameter by 180 feet deep, though it was later deepened to approximately 200 feet. A heading was at this time driven for a distance of 467 feet. It was five feet six inches high by three feet six inches wide and was situated at a depth of 137 feet below the engine house floor. At the end of the heading a borehole three inches in diameter was driven for a distance of 105 feet, inclined upwards at an angle of seventeen degrees from the horizontal. A borehole six inches in diameter was sunk in the floor of the heading, ten feet from the end, to a depth of seventy four feet. Prior to the contract being awarded to E. Timmins, he had agreed to work continuously, with three shifts of well sinkers, covering the twenty four hour day.

The buildings, entrusted to Messrs. William Trowe and Sons of Wednesbury, were to a Gothic style, designed by architect Henry Naden of Livery Street, Birmingham, and were built in 1876/78 of red bricks with stone dressings. Land for the station was obtained on a 999 years lease from Lord Hatherton at a perpetual rent of £11 per annum after an initial payment of £300. A further payment of £3,000 was paid to Lord Hatherton in lieu of his not working mines in the vicinity of the station.

There were two single cylinder double acting Cornish beam engines made by James Watt and Company, Soho Foundry, Birmingham.

Each engine was 165 horse power with cylinders of sixty five inches and ten feet strokes, capable of raising two and a half million gallons per day, each lift raising 340 gallons. The lower boiler house contained four Lancashire boilers and a flag covered pump room housed the air pumps, condensers and force pumps. The latter were worked from the beams projecting from the engine house. Deep well pumps were situated at the other end of the engine house and were worked by auxiliary beams. The engines were supplied with steam from the four Lancashire boilers, each seven feet in diameter by thirty two feet long, the working pressure being 20 lbs. per square inch.

At Moors Gorse, two acres of land had been leased from the Marquis of Anglesey at a perpetual rent of £300 per annum. Here the engine house was built in the Norman style, the engines being duplicates of those at Huntington, erected by the same contractor. John Aird and Sons Ltd. was contracted to sink a well sixteen feet diameter, 104 feet deep. At a depth of 94 feet a heading was cut 5 feet 6 inches high, 4 feet 6 inches wide, 2,581 feet long, running away from the road at right angles. The heading, rising upwards at a slope of 1 in 92 extended into the coal measures. From the bottom of the well were two boreholes, 3 inch diameter, one 33 feet and the other 50 feet deep. Cottages were built at both sites for the convenience of the workforce. Building work at this station commenced in 1875 and was completed in 1879, by William Trowe and Son of Wednesbury.

At the Scout House Reservoir the company made their final halt and spent some time admiring the picturesque views prior to proceeding to a spacious marquee erected on the Company's ground where lunch was provided by the Directors. The marquee was decorated with the motto of the Company " The Common Weal". Scout House Reservoir was formed on one of the high hills above Hednesford and derived its name from a scout house which stood on the side of the hill, just below the reservoir. It was the locality, in the nineteenth century, for training racehorses. The site, leased from the Marquis of Anglesey, covered an area of sixteen acres, thirteen of which were filled with water. The forty three million gallon circular reservoir of the earthen embankment type was constructed by Joseph Walker of Crewe between 1877 and 1879.

Eight years later, June 1887, the embankment of the reservoir collapsed. Earlier in the day a main in the vicinity of the receptacle burst and the water from this caused some damage as it rushed down the valley toward Hednesford Station. Before repairs could be effected the embankment showed signs of collapse, valve operations were carried out in an effort to relieve the pressure but this did not save the embankment. The waste water in its course down the valley carried with it a large quantity of gravel which was deposited on to the property of the Cannock and Rugeley Colliery Company. A large quantity of water found its way down the pit shafts at the Pool Pits and growing crops in the valley were damaged. Water also washed away ballast from underneath the sleepers supporting the railway track, rendering the line unsafe for engines to pass over.

When the reservoir emptied a large crack was visible across the bottom.

Through the years this reservoir was badly affected by subsidence due to mining operations. By 1928 it had dropped nineteen feet and also tilted to the extent of nine feet on a diameter at coping level. Its capacity when filled with ten feet of water had dropped to ten million gallons. The diameter at the coping was 700 feet and at water level 580 feet. Never wholly filled, it was finally abandoned in 1930 due to leakages caused by mining operations in the district. Today it is known as Hednesford Raceways.

Although these three works were officially opened on 21st July 1880, they had been operational since 1879 but no favourable opportunity had presented itself for holding an opening ceremony. A souvenir, a silver trowel which has been carefully preserved, can be seen at the head offices of the Company, it is inscribed;-

Presented to
Frank James Esq. J.P.

Chairman
of the South Staffordshire Waterworks
Company

To commemorate the inauguration
of the New Works of the Company
at Cannock Chase 27th July 1876.

Early in 1935 a cast iron pipe in the rising main of No 1 well pump at Huntington fractured, a mishap which put the engine out of commission. There was a series of stagings in the well at distances of 27 feet and the rising mains had feet which were bolted to the staging girders. When the remaining engine was pumping at its maximum rate it was not able to lower the water level in the well sufficiently to permit men to go down and release the defective lift for withdrawal and the replacement of the damaged pipe. The installation of temporary pumping plant was considered in order to assist the remaining engine to dewater the well. Steam plant was ruled out, no electric supply was available and no suitable diesel plant could be hired. As the source of supply needed to be retained, a decision was made to reconstruct the whole station and to include plant for water treatment. Various types of prime mover were considered, and, after a favourable offer of an electric power supply had been received from the Cannock Urban District Council, it was decided to install electrically operated plant. The new pumping plant consisted of two electrically driven centrifugal well pumps.

Preliminary work involved in the change over began in 1936. It was necessary to remove the timber platforms on the various stagings to allow the new well pumps to be installed, and in order to do this some means had to be provided to give assistance to the remaining workable engine in lowering the water level in the well. By plumbing the well, it was found it was possible to erect temporarily, one of the new well pumps along side the defective well pump and use it for that purpose.

The power supply authorities undertook to lay one of the cables and arranged a direct current supply from a neighbouring colliery. The well top was open and as the new electric pump motors must work under cover, the construction of the well pump house was put in hand, the overhead crane erected, and a temporary roof provided and suspension girders for the new well pumps were temporarily fixed at the well top.

On completion of the first well pump at the maker's works, it was tested there to comply with the guarantees and then erected in its temporary position in the well. Suitable pipes were fixed to discharge into timber troughing leading to a large surface water drain connecting with a stream feeding to the River Penk. Continuous pumping operations started on May 8th 1936, with the sound beam engine pumping into supply and the new centrifugal well pump discharging to waste. The engine varied its rate of pumping to suit the district requirements, while, as each staging was cleared by the retreating water, the speed of the well pump was raised to increase the rate of discharge until the bottom staging was reached and cleared on May 11th, when the centrifugal pump was stopped, allowing the water to rise to its normal level.

Pumping into supply ceased on May 17th, the old steam plant was shut down and was later bought and dismantled by William Kayley Limited of Manchester. Two old cast iron rising mains were abandoned in the well. The four boilers were removed by May 27th, and the alteration of the boiler house commenced. The whole of the electrical equipment and the booster pumps were installed and the plant was brought into commission, pumping into supply, on November 22nd 1936.

Contractor for the pumping plant were Messrs. Sultzer Brothers (London) Ltd. with the English Electric Company Ltd. London acting as sub-contractors for the electrical equipment.

A decision to close Huntington Pumping Station was made, by the Board of Directors, in 1980. The buildings have been demolished and the site utilised for housing, but the wall surrounding the former pumping station was retained for a short time. This wall has recently been replaced and today all that remains to remind you of the former station is the name of its architect, Henry Naden.

Of the three works commissioned, only Morse Gorse Pumping Station in a different housing remains. In 1925 the four original boilers at Moors Gorse were condemned as unfit for further service. Two new boilers were installed in 1926 when the opportunity was taken to raise the boiler house floor level and remodel the steam range on more efficient lines.

Moors Gorse engines were disposed of as scrap in 1970, when the original engine and boiler house were demolished. First stage of electrification was carried out in 1955 and the scheme was completed with the erection of the new well pump house in 1972. The total cost of electrification was £94,500.

Rowley Reservoir was constructed under powers obtained in the Act of 1875. Four tenders were received for its construction near to Rowley Hall. Joseph Walker of Crewe, Cheshire agreed to construct the open topped receptacle at a cost of £4,260 nearly £3,400 lower than the tender of Berry of Dudley who knew the area and the difficulties associated with the site. The contract was signed on December 28th 1875 and work on site commenced the following month. Covering an area of two acres, the site was acquired from the Rev. W.A. Newman and his mortgagees for £2,309. During construction work, whilst the puddle lining was being placed, it slipped in many places through being carried up too quickly. Joseph Walker attributed the slips to the settlement of the land from mining operations of Rowley Hall Colliery. Water was turned into the reservoir in August 1877.

Rowley Reservoir, although constructed to hold three million gallons was never wholly filled. On completion, the contractor disputed his liability to maintain the work, and when the time came for settlement of his account, a claim was submitted over and above the contract amount, a court case followed. The claim was eventually settled by arbitration. Seven months had been allowed for completion, with a penalty clause of fifty pounds per week in default. A great quantity of rock and stone encountered during excavation slowed down work. Final cost of the work amounted to £7,786.

When taken over by the Company, the reservoir was found to be leaking, needing repairs to the puddle and the blue brick flags on the side. At one time as many as twenty nine cracks were noticed, the result of mining operations, brought as near as possible to the site by the colliery proprietors, as an inducement to the Company to purchase the minerals as a means of support. The Directors did not consider this advisable at the time, and repairs were the cheapest way out. A coal seam lay six hundred feet below the reservoir and was twenty two feet thick. By 1887 the reservoir had sunk by three feet but continued in use causing an outcry from the Rowley Local Board, as water was continually discoloured picking up the puddle due to the low level of the water. It became another white elephant at this time, never more than half filled, Rowley Reservoir was finally abandoned in 1924. An order was issued by the Local Authority for the compulsory acquisition of the derelict reservoir and land in 1947. The site remained untouched until 1968 when houses were built, today Cambourne Road runs over the whole length of what was Rowley Reservoir.

The Cannock water supply.

At the time of the 1875 Act of Parliament the Company's district was further enlarged by including Cannock and the adjoining parishes. Cannock's water supply dates back to 1736 when a Conduit Trust was founded. A meeting was held in Cannock on July 20th, 1735 when it was reported that;

" Whereas there is a proposal made for bringing water into Cannock in the County of Stafford from a certain spring in the grounds of Dr. William Byrche of Leacroft which will amount to a great change, we the undersigned agree"-

Then followed an agreement to subscribe amounts varying from two shillings and sixpence to fifty pounds to enable the work to be carried out.

On May 25th. 1736 the first scheme was completed at a cost of four hundred and five pounds, thirteen shillings and seven pence, which did not include the pumps. Water was brought into the town by pipeline from Stringers Meadow, Rumer Hill, Leacroft. The Trust was endowed by the Lord of the Manor, the Earl of Uxbridge, the Bishop of Worcester, Sir Robert Fisher and later became a registered charity. In 1759 a collection had to be made to put it into repairs. Originally there was only one pump, but this increased to eight, two in Mill Street, one at the corner of the churchyard, one in Market Place, one near the Green and the other in Penkridge Road. A report on the water in 1863 described it as equal to that of Malvern. The old conduit pump situated at the entrance to Mill Street was removed prior to a road widening scheme being carried out in 1956.

An informant gave some particulars to a Company official about the water supply at Cannock, in 1876. It was said that recently a six inch main had been laid down, this was in addition to the existing four inch main. It was further stated that Cannock was bound under a deed of the Conduit Trusts to provide a gratuitous supply to all inhabitants, but then, were not bound to carry the water into the houses. A charge was made for any house so supplied. It was further reported that Newlands Well had recently been acquired, perturbed on hearing these reports, H. Haselden the Company Secretary wrote to the Council setting out their rights in supplying Cannock.

John Harvey a solicitor for a Miss Crocket, wrote to the Company to say that he understood from the late Mr Cotterill, who took a lease of certain springs at Rumer Hill from the Conduit Trusts, that he had a verbal understanding with the Company, that as it was not their intention to supply Cannock, he would not oppose the Bill in Parliament that related to a supply to Cannock. It was further stated that for the past ten to fifteen years, Mr Cotterill had spent a great deal of money in giving the Cannock people a supply of magnificent spring water, and had thereby earned for himself the gratitude of a great bulk of the people of the town. Recently a supply had been added from the New Sands Springs so that thousands of gallons of water, daily ran to waste by reason of the demand not being equal to the supply.

The Company replied to the effect that there was no understanding with the late Mr Cotterill and that the Company was under obligation to supply water to any person asking for it, under the usual conditions, no request could be refused. His client, who now held the lease, had no right to supply water by laying pipes in the roads and the Secretary reminded Mr Harvey that the Directors would take steps to prevent an illegal or unwarranted sale of water.

Mining subsidence.

Another cause for concern to the Company during the 1870s was the numerous breakages in mains caused by mining operations throughout the district.

Many requests were received from property owners for pecuniary assistance to purchase the mines and mineral rights from the landowners, and if the Company's apparatus was in danger, contributions were given. Areas of common land and mines underneath were reserved to the Lord of the Manor by Acts of Parliament passed in 1784. At the time of the passing of the Acts, most of the land lay waste, the mines underneath it were supposed to belong to the Lord of the Manor. According to the promoters of the Bills, it was then found to be impossible to work mines without some reservations. The property owners, with few exceptions, consented to the provisions of the Enclosure Acts. These measures not only gave the Lord of the Manor power to do anything he liked with the coal and limestone underneath the enclosed areas, but as was stated in the preamble to the Bills, he was entitled to " soil underneath the common water, land and other things ". The Acts enabled the Lord of the Manor and his leasees to work the mines without being liable to compensation, but as a set off to these almost unrestricted privileges, there was a clause stating that they must do as little damage as may be, the machinery for redress was never set in motion. The Acts proposed a method of obtaining compensation but it was surrounded by insurmountable difficulties, in the Company's cases they decided not to claim. An injunction served by a Mr Bell, a Brierley Hill brewer against the Earl of Dudley to restrain him from working certain coal mines whereby the plaintiffs property would be let down, ended with the judge referring to the Enclosure Acts and denying the injunction, an extra-ordinary specimen of legislative wisdom of the period when George the Third was King.

A demand for shares and water.

Increased applications for shares, gave an indication that the public now looked upon the Company as being in a sounder financial position, and an undertaking for the security of a good investment, the dividend payable in 1875 being six per cent, the highest dividend that had been payable to this date. In every direction the demand for sanitary improvement was loud and persistent and there remained many populous places within the Company's limits which were still without a water supply. For these places the Directors considered it was their positive duty to provide a supply, assured that they would find themselves recouped by the revenue that would be derived from them.

The demand for water was greatly increased at this period. The Public Health Act of 1875 gave enlarged powers to Local Authorities to ensure that every house should have a pure and wholesome supply of water. Where houses were not supplied by the Company, but dependent on private wells for their supply, examination was made of the wells, by Local Boards of Health, and samples of water analysed for contamination. If samples proved positive, mains water was laid on, and payment for the service was recovered later.

Many districts outside the towns remained dependant on wells and other local sources for a water supply. No mains had been laid chiefly because of the wide gap between income from water rates and outlay on mainlaying.

Examinations of districts were carried out by an inspector, employed by the Company's Solicitor. At Smethwick out of 948 houses visited 928 considered themselves well supplied from local sources and were unwilling to pay for a supply from the Company. In Pensnett near Kingswinford, out of 779 houses visited the great majority lacked a supply and 398 were willing to pay for a supply. Water rates that could be expected from these prospective consumers amounted to £291. Mains were immediately laid to the Pensnett area in March 1878 at a cost of £1,200.

Water pilfering.

During this decade, the Company made many appearances in court cases throughout the district, issuing summonses for a miscellany of misdemeanours including trespass, fishing and bathing in reservoirs, illegal pipe connections and regulation offences. A majority of incidents were concerned with water stealing. The hundreds of culprits of all ages, in the towns of Dudley, Tipton, Walsall and Burton appeared before the courts, charged under Section 20 of the Water Clauses Act of 1863. Watermen and other employees were encouraged to report all cases of the offence and were rewarded by a payment of two shillings and sixpence. Secretary H. Haseldon reported to the Board of Directors that men were turning a blind eye to offenders as their position in the neighbourhood was becoming very uncomfortable. A few cases of watermen being threatened and assaulted were recorded.

On a temporary basis a Mr. Lol Galeford, who was formerly in the employ of Birmingham Water Company as a detective, was given the task of tracing water stealers, being paid by commission on cases where a conviction was obtained. An eight years old girl appeared in court at Oldbury, charged with stealing a bucket of water. The bench strongly criticised the Company for bringing children into court knowing full well that it was impossible to punish them. This particular case was dismissed.

One news item on water stealing was reported as far away as West Canada in the "South Simcoe Times" it read;

For stealing a gallon of water.

On Tuesday at the Oldbury Police Court, England, a woman was fined two shillings and sixpence and costs or seven days imprisonment for stealing a gallon of water, value a farthing, the property of the South Staffordshire Waterworks Co. from the tap of Thomas Jackson. We imagine the devil hereafter, tempting the Directors of this institution with a chunk of ice when they become inhabitants of the infernal regions.

Water stealing was being carried out on a large scale in all districts becoming a major talking point in newspapers.

The editorial column of the Birmingham Daily Post contained the following article;

The officers of the South Staffordshire Waterworks Company have recently instituted proceedings to enforce the law which makes it criminal for any one to take water of their supply without paying for it. The cases were those in which poor people inhabiting houses not furnished with the company's water filled their kettles from taps in adjoining cottages, which were so furnished. For this offence they subjected themselves to a penalty of £5 each. The amount was reduced to shillings, but even that was more than one of the offenders could pay, so he had to atone for the robbery by undergoing an imprisonment of fourteen days. The account of these proceedings should be carefully noticed by owners of cottage property here and elsewhere. It is no doubt in consequence of their own abodes being badly supplied with water that poor occupants, ignorant of the law, are led to beg a kettleful off better furnished neighbours. If so, the landlord is the person who has really to answer for the offence. A good supply of water is a requisite which every house should contain, but its want is not to be made good by pilfering the property of a public company. That is certain not to be long endured. Holders of small house property ought therefore to look into the question, and to see that their tenants are not driven to such a resource for the supply of so necessary an article as the water in which they infuse their tea.

Probably the most unusual water stealing case came before the Dudley Magistrates Court in June 1872. Emmanuel Astley was charged with the offence. It was alleged by Joseph Porter, the Company's collector, that the defendant had stolen water from the tap at St James Church, Eve Hill, Dudley. It was taken by Astley to clean the schools belonging to the church. Porter stated to the court that the water was supplied for use at the church and not the school. Churchwarden Mr. Price said the defendant had no felonious intent, he was fined sixpence, which was paid immediately.

The Company did not make much capital out of a water stealing case at Wednesbury in 1888, nor did they present a very dignified appearance. Charles Heron, aged thirteen, of 12, Elwell Street was charged with stealing water from a tap belonging to the Company. The first blunder consisted of Inspector Grosvenor handing to the Stipendiary, Mr. N.C. Neville, a written copy of the Section of the Act under which the proceedings were being taken, instead of the printed copy which was asked to be supplied. The Stipendiary refused to take the written copy and stated he did not know Acts of Parliament by heart. Later a printed copy was presented, when the inspector said he saw the defendant take a gallon of water. Two months had elapsed since the offence, to allow time for the owner of the property to pay for a service to be laid on, when the charge would not have been proceeded with, this unfortunately had not materialised.

The Free Press wrote: Our mild, easy tempered, even humorous Stipendiary, carries anger as the flint bears fire, and occasionally astonishes the court with a burst of indignation as alarming and unexpected as a thunderbolt out of the blue.

His denunciations, on this occasion, terrified the water inspector into the very ingenuous admission, that the prosecution had been pending for a couple of months, in order that, to put it in other words, the defendant might be a kind of turncock to turn on the S.S. water to the neighbouring houses.

Mr Neville said that this wily little scheme had failed, and the proceedings were undertaken in a vindictive spirit. He described the charge as frivolous and dismissed the case.

Water wastage and complaints.

Waste of water also called for strong action, a reward of five shillings was offered to any person giving information leading to conviction for wilful waste. Bills and placards were posted up throughout the district announcing the intention of the Company to prosecute in every case.

Actions taken against the Company were mainly for failing to provide adequate supplies, foreign objects in the supply and unwholesome water supplies. A complaint was received by the Company at their Tipton Office in October 1873 from consumers in Eagle Lane / New Road, Tipton who complained of maggots in the supply. The area foreman William Norman reported on the incident. "I found the water taken from this stand pump still full of maggots and took down the woodwork around the tap, thousands of maggots were found creeping about the wood, also worms and other creeping things. I washed out the pump spout and leadwork etc. and afterwards filled up a bottle of clear cold water which I have sent for your inspection. One of the tenants remarked that the water was always clean until a lot of sheep's entrails was stuffed up the pipe to be cleaned." It was recommended that the tap should be removed from its position near the water closet to a more wholesome place and the washing of such filth carried out at a distance from the tap.

A letter dated 2nd November 1874 from the Brierley Hill Local Board, complained of a green sediment in the water from the Company's pipes. A public meeting was held in Dudley on the same subject four days later. Dr. Hill an analyst reported on the sample, to the Company, stating that the nature of the sediment was a minute water confervoid algae, not uncommonly found in standing water and he calculated that it purified the water and was not in any way injurious to the consumer. William Vawdry stated that a green growth of weed, was seen on the surface of the water at Shavers End Reservoir a month previously, which grew too rapidly to allow removal by skimming. After allowing the water level at the reservoir to fall below the upper draw off pipe, and running water into supply from the bottom draw off pipe, the weed completely disappeared in a natural way, dying and settling to the bottom. It was remarked that a similar growth took place at Walsall Reservoir the previous year. The Engineer was authorised to fix sieves to stop the passage of fish and insects into the main from Walsall Reservoir the following month, this order was later deferred and Vawdry was instructed by the Board to procure some pike or jackfish with a view to destroying the fish and insect life.

The Bateman Report.

An action was brought against the Company on 18th December 1875 by Dudley Corporation, for failing to supply pure water for domestic purposes between 1870 and 1875. Water had to be brought long distances, owing to the configuration of the area of supply, this water had to be pumped and re-pumped in some cases, three times before it was available for consumption. This, coupled with the use of open reservoirs, was responsible for causing the problems. The court action of Dudley Corporation, resulted in the case which became known as the " Bateman Report of 1876".

The Court Proceedings were heard at the Assizes in Worcester on Saturday 11th of March 1876 before Judge Sir W. Field. Shortly before the commencement of proceedings Mr.H. Mathews council for the Company announced that an offer of a compromise had been made by Mr. Motteram on behalf of Dudley Corporation. Frank James the Chairman of the Company expressed himself as entirely opposed to a compromise, being strongly of the opinion that a trial would end in favour of the Company. Mr. Mathews having examined his brief, considered that it would not be safe to trust a jury. Frank James, feeling that it would be extremely difficult to go to trial in opposition to the Company's advocate, consented to an arrangement by which a verdict of not guilty was to be recorded and the Company undertook to do what, if anything, an eminent water engineer to be named by the Judge, considered necessary to render the supply of water to Dudley pure and sufficient under their Acts of Parliament. The Company agreed to pay a sum of £200 for court costs.

The Engineer, selected to carry out the inquiry at the Town Hall Dudley on 4th August 1876, was John Fredric Bateman of St. George Street, London.

Joseph Stokes appeared on behalf of the Corporation and Henry Money Wainwright on the Company's behalf. After hearing all the evidence including a history of complaints and breakdowns of the pumping plant, all the parties agreed to make an inspection of the Company's works on 22nd and 23rd August. The district from Dudley to Lichfield was toured, the mode of transport being by horse and break. On 19th September 1876, the Bateman Award was published. Twelve recommendations were made which included -

Erecting duplicate engines at Wood Green for pumping to Dudley and to lay a main from Wood Green to Dudley.

To draw water out of Shavers End Reservoir at the side opposite to that of the inlet pipe and to strain the water through a copper gauze of forty strands to the inch.

To discontinue the use of Coneygre Reservoir as a storage for Dudley forthwith but to continue pumping at that station until the completion of the Wood Green engines, and for the purpose of supplying the highest levels.

To provide for a consumption of twenty gallons per head per day for domestic use.

To maintain a pressure of fifty feet head above the street level in Dudley except where Shavers End Reservoir could not provide it. Loss from friction to be taken at twelve feet per mile.

Shavers End Reservoir was to be kept at top water level and in the event of the water becoming injured or contaminated by exposure, or by contiguity of furnaces, or manufactories it should be covered over.

The Directors at once proceeded to carry out the directions of the award, and William Vawdry was instructed to prepare the plans. Pipes for the main from Wood Green to Dudley were ordered from Messrs. Cochrane and Company. Joseph Walker offered to lay the pipes for five shillings and sixpence a yard and to cart them from the railway station to the pipe trench for two shillings and sixpence a ton.

Coneygre Reservoir had been subject to leakages over the previous ten years, in March 1867 the receptacle had been inspected on the Company's behalf by John Yardley of Burnt Tree House, Tipton. He informed the Company that he had surveyed the Earl of Dudley's workings in the bottom coal, which was six feet thick adjoining the Coneygre Reservoir, and found work had been carried out within six yards of the reservoir in the west corner, which in his opinion had caused sinking in the reservoir and under the canal. Following the Bateman Award, the reservoir was closed and remained unused until 1919 when the question of partly filling the receptacle was considered. A clause in the conveyance from the Earl of Dudley did not allow this at the time. It stated that in the event of the Company ceasing to use the land as a reservoir for a certain period, the conveyance so far as it relates to the working of mines and minerals is determined, and further the Company may not sell the land without first giving the Earl the right of pre-emption. Over the years back filling of Coneygre Reservoir has taken place. This work continued until it was completely infilled by 1986.

The Engineer's report of the trunk mains network.

William Vawdry gave a description of the Company's principal mains in 1875 they consisted of;

A twenty four inch main, Lichfield to Brownhills, a six inch main from here to Chasetown.

A twenty two inch main, Brownhills to Walsall and Wednesbury.

A fourteen inch main, Wood Green to West Bromwich.

An eighteen inch main, Wednesbury to Wednesbury Reservoir with a twelve inch branch to Tipton and Dudley, the water at Shavers End having been re-pumped from Coneygre, Tipton.

A twenty four inch main from Wood Green Pumping Station serves West Bromwich then divides: twelve inch main to Oldbury, six inch main to Smethwick, six inch main, Oldbury and Smethwick.

The daily consumption at this time was five million gallons per day.

Disposal of Parkes Hall Reservoir, Dudley.

Dudley Waterworks Company finally settled their differences with Lord Dudley in April 1867 but difficulties still existed regarding the works at Parkes Hall.

Reverter Rights Clauses remained vested in the Trustees of the late Earl of Dudley and the Trustees had no rights to grant a release. This stated that if the Company's works should be abandoned or given up by them or after completion of the works, should for the space of five years cease to be used for the purposes of the Act, the land belonging to the Company should in either of the cases revert to the persons from whom it was originally purchased. Lord Ward was asked by the Dudley Company to consent to the Trustees waving any claim they may have under the reverter clause. The late Earl died in 1835, leaving a son, a minor at eighteen years old, as head of the family. By his fathers will, he did not come into the possession of the vast estates bequeathed to him until 1842, when he attained the age of 25 years. Later he was honoured when upon the advice of Lord Palmerston, Queen Victoria revived in his favour the old family titles and he was created Earl of Dudley and Viscount Ednam.

Difficulties were eventually overcome by the Company under their parliamentary powers, taking the works as purchased and agreeing to sell the property as surplus lands for the benefit of the Dudley Company, who in turn would reimburse the late Earl's estate. Parkes Hall Reservoir at Woodsetton, an inheritance from the Dudley Waterworks Company, disused for many years, was eventually sold in 1877 to the Earl of Dudley, after three years of negotiations. Dating back to 1835 / 1836, the open embankment type reservoir, was built with bricks laid in concrete, and covered an area of five acres. A massive Gornal stone wall enclosed the site, bounded by the lands of the Earl of Dudley and Thomas Turley, and by the road leading from Upper Gornal to Woodsetton and Coseley. The reservoir was filled by springs and surface floods of the surrounding land basins, flowing into and out of it by means of well constructed feeders, filtering tanks and sluices, supplemented by water pumped and discharged at Ashfield Pumping Station gravitating a short distance to Parkes Hall.

The auction sale of the reservoir and pumping station took place at the Dudley Arms Hotel, High Street, Dudley on 24th May 1875.

These works never figured in McClean's plans for use by South Staffordshire Waterworks Company but were a feature of his own scheme designed in 1851.

The last water supplied on to the district from Parkes Hall was in 1872 when drought conditions were in existence in the district. Upwards of 675,000 gallons per day were pumped on to the area during the emergency. Henry Wainwright suggested that the Company should purchase the reservoir for themselves, as the mineral rights were included in the sale and the site was in closer proximity to Shavers End than Coneycgre Reservoir, which was always in danger of mining subsidence. William Vawdry overruled the suggestion.

The engines from Ashfield were purchased by Birmingham Canal Navigation for £700. One engine was installed at Titford Locks, Oldbury and was finally scrapped in 1935. The other engines were kept as spares, until they were sold as scrap to help the Second World War effort.

A supply to Halesowen.

The Guardians of the Stourbridge Poor Union Law, as the Rural Sanitary Authority wrote to the Board of the Company in 1876 requesting a supply to Halesowen. William Vawdry reported on the request in September of that year. The nearest water main was at Rowley. His estimate included the cost of laying pipes through nearly the whole of the town except for the parishes of Hill and Hawne. At Hawne there was only a few cottages and Hill was at the end of the area of supply. The rest of the town was thickly populated and many were willing to take a supply which Vawdry stated would give a fair return on the outlay.

The cost of extending the main was estimated at £3,678. In all 3,423 yards of eight inch main, 750 yards of six inch main, 1,218 yards of four inch main and 2,157 yards of three inch main was required. The mainlaying was carried out during 1877 by John Aird & Sons of London, their charges were, for three inch pipework one shilling and a penny a yard, four inch pipework at one shilling and threepence, six inch pipework at one shilling and seven pence and eight inch pipework at two shilling and three pence. Cartage charges were one shilling and three pence per ton, per mile. An eight inch main was connected to the Company's main near the Oak Inn at Blackheath and extended down Gorsty Hill to Coombes Gate then on to High Street and ending at Stourbridge Road. Supplies were immediately made available on the area.

Shares converted into stock.

Because of a bank overdraft in 1878 it was necessary to obtain Parliamentary powers to raise an extra £200,000 ordinary and loan capital. At this time a change occurred in the denomination of the capital of the Company. Shares were converted into stock, ordinary shares issued under the Acts 1853 - 1864 being converted to stock, bearing a maximum dividend of ten pounds per cent, and shares issued under the Act of 1875, seven pounds per cent stock.

1878 facts and figures.

Twenty five years on from formation, the number of services laid reached 30,962 revenue from rates for the year ending 1878 was £42,065. 1s 11d and the average cost of water per house was 14s 4d per year. Party supplies, one service supplying more than one house and sometimes sixteen houses, were in the majority. Average number of houses sharing a service was three and a quarter and the cost of having a service laid was nineteen shillings and threepence. Average water rate per year, including income from public houses, was nineteen shillings and fourpence.

Death of Richard Jesson.

Richard Jesson the longest serving member of the original Board of Directors died at Cheadle, Staffordshire, on 14th September 1878, he had suffered ill health for some time and his demise was expected. By profession he was a solicitor with offices in Bridge Street, Walsall, site today of the Walsall Co-operative Society Building. He was born 25th May 1800, eldest son of Richard V. Carew Jesson, Solicitor of Spring Hill, Walsall. Jesson's education was received at Lichfield, under the tuition of Dr. Harwood, and at Stoke from the Reverend John Cotterell. On completion of his education he was admitted to the Roll of Attorneys, joining his father in his solicitor's practice in 1821. Richard Jesson was interred in the family vault in the Old Burial Ground, Bath Street, Walsall.

Update of district supplies.

Walsall had strenuously opposed the 1875 Bill. Ultimately the Company entered into an agreement with them for the supply of water to the village of Bloxwich. Very urgent demands were made on the Company to lay the necessary main extensions in order to comply with the request. It was reported in 1879 that of the 2,200 houses in Bloxwich only 112 had requested a supply, of these, 66 services had been laid in the last six months. Similar main extensions had been carried out in Halesowen, Rowley and Kingswinford. Of these three places with 17,000 houses only 1,800 received a supply. On the other side, out of 3,054 houses in Darlaston the Company supplied 2,899 and in Wednesbury there were only 348 out of 4,883 that did not take water from the Company.

It was an extra-ordinary fact that returns of the census showed that the death rate at Darlaston, was smaller than any other town in the United Kingdom and had been reduced to ten in the thousand.

In Oldbury, Smethwick and West Bromwich by 1880, of the 15,000 houses only 5,000 were supplied by the Company, the Chairman remarked," It is difficult to understand the repugnance people had to having the Company's water, and the preference they had for their polluted well.

They would know the parody of Mrs. Heman's "Cottage Homes of England";

The cottage homes of England,
How filthy they smell,
There is poison in the cesspool,
There is sewage in the well

And it was true in the majority of cases, the sparkling water containing elements of the deadliest poison.

Hanch Reservoir built.

Francis Stileman was instructed eight years previously, in 1871, to make a thorough examination of the sources of supply at Lichfield and of the means of making available a larger quantity of water for the Lichfield engines. He confirmed that the principle source of supply, especially in dry weather, was derived from the tunnel between Sandfields and Bourne Brook. During this period, the flow of the Leamonsly and Bourne Brook Streams, being open water courses, were subject to use and loss, especially in the latter case, as the water was impounded for the purpose of Seedy Mill. When the mill was running, this use of water was for twenty hours of each day. The water passed away too quickly to allow all of its flow to pass into the aqueduct to Stowe Pool. Stileman recommended the construction of a large reservoir to impound the water at a higher level than Stowe Pool Reservoir, so that in a drought period the supply could be used from the proposed reservoir. The recommendation was implemented eight years later with the construction of Hanch Reservoir which is situated near Hanch Hall, Kings Bromley, one and a half miles from Armitage and four miles from Lichfield. Construction work on site started in October 1879 to supplement the water supply to Sandfields Pumping Station. Covering an area of nineteen acres, the land was purchased from Sir Charles Foster in April 1876 for £4.881. John Aird and Sons constructed the thirty two million gallon reservoir which was fed by the Redmore, Maple and Ben Streams and the Bilson and Ashmore Brooks.

The reservoir was rectangular in plan, having a length of 880 feet and a width of 530 feet and was eleven feet six inches deep. The top water level was 254.49 A.O.D. When the reservoir was full, water covered an area of approximately eleven acres. It was conveyed by gravitation through a conduit, approximately four miles in length, which was cut through the red sandstone rock which forms a gathering ground from the neighbouring district, eventually flowing into the wells at Lichfield. Twenty six well shafts, brick built or cut in the stone, collected extra water for the aqueduct system. Number one is situated near to Hanch and No. 26 near the aqueducts end. The situation of four of these shafts are, rear of the Angelcroft Hotel, the Recreation Grounds, the Festival Gardens and at the side of the Swimming Baths, all in Lichfield. These well shafts have been in use as access hatches and sampling points.

The tunnel's maximum depth of 132 feet is reached at the junction of Collins Hill and Grange Lane and is at its minimum at the junction of Ashbourne and Rugeley Road and was last surveyed in 1933 and then only in part. Information on the precise location of the access shafts has been lost and a number of them are now located under buildings and built up areas to the extent that only six of the original shafts are in any way accessible.

Cost of the materials used in the construction of Hanch Reservoir were; cement, three shillings a bushel, best bricks, two pounds per thousand, common bricks, two pounds per thousand, concrete, one pound one shilling a cubic yard. The workers were paid; Navvies, five shillings a day; mason, carpenter and bricklayer, eight shillings and sixpence a day, a horse and cart with driver was twelve shillings a day. The water was turned on into the reservoir on 19th of May 1880.

The effects of a burst main at Cannock.

Burst mains occur regularly and during a twelve month period an average of 1,200 are repaired. Mains burst because of various reasons but the majority are the result of underground movement, traffic conditions, water hammer shock, faulty pipework, rapid change of temperature or damage by contractors. If a main bursts today, although roads and footpaths can be torn up, the wasted water normally flows down the nearest drain. Metalled roads allow quick drainage to occur, and damage to property is slight. The valve controlling the length of main is soon shut down, but this was not the case in the early years of the Company's operations.

On 23rd July 1879, a main burst in Hednesford Road, Cannock, thereby causing great havoc. The local policeman, Mr Barton, who was near to the scene when the main burst, resembled it to the exploding of a cannon. Mr & Mrs Jackson of the Unicorn Inn, who had just retired to bed, were attracted by the noise similar to a continuous rumbling of thunder and discovered to their alarm a stream of water rushing through the building. The water rising in some rooms to a depth of twelve inches, the cellar not surprisingly was completely submerged.

The water gushed into the yard and young pigs in the piggery had to be removed into the loft of an adjoining building. The road from Cannock to Hednesford was flooded and the water joined a principle stream running along the main road. Near to the station the road was torn up and the foundry of Evans & Company suffered severe damage with the walls left standing in a dangerous condition, part of the foundations having been carried away. It was two hours before the valve controlling the main had been shut down, a man had to walk from Huntington to Cannock to carry out the valve operation.

Dirty water at Sedgley.

Secretary H. Haselden wrote to T.A. Walker, Medical Officer of Health for the Upper Sedgley Local Board in July 1880.

Dear Sir, In the Birmingham Daily Gazette a paragraph appeared stating that in your report to the Local Board of some fatal cases of fever at Hopyard, Gornal, you observed that although the house was supplied with water by our company the inhabitants refused to use the water for domestic purposes owing to its discolouration and you went on to say that you trusted steps would be taken to inform the Company of the state of the water. In consequence of this paragraph our engineer caused a special examination to be made and he found the water at the spot, quite clear and bright both in samples drawn from the tap in the ordinary way, and also by what is a surer test, viz, by opening the hydrants in the main, when, if any of the least discolouration exists, it must show itself. On being questioned, the mother of the poor man who was buried last Saturday stated that the bottle of water she sent to the "doctor" was not taken from the tap, but from a trough at some distance from the cottage. It is very easy to imagine that water in an open trough may be discoloured by the accidental admixture of extraneous substances, but for such a mixture our Company is in no way responsible. We are responsible for the water in our mains and we have proved that that is entirely free from objection. I hope you will see that, in justice to the company, a little more careful examination should be exercised before publicly making statements of this kind, and I trust you will kindly read this letter at the next meeting of your Board.

I remain, dear Sir, yours faithfully,

H.Haselden. Secretary.

A covered reservoir at Burton on Trent.

In January 1877, William Vawdry was instructed by the Board to report on and recommend, a site for a Reservoir at Burton on Trent. The importance of siting a reservoir at Burton had been necessary, not because of any general increase in consumption, but to satisfy the majority of consumers who required water in large quantities over short periods for brewing and washing purposes. Large connections from the Company's mains had been requested and allowed, thereby the existing twelve inch main from Lichfield was seriously deficient of water at the busy periods. Three sites were considered suitable for the siting of the reservoir, Waterloo Clump, Scalpley Hill and Outwoods Hill. The latter site, near Shoball Grange was selected. Scalpley Hill was situated at a higher level by thirty two feet, but Outwoods had the advantage of being situated on the same side of the River Trent as Burton and therefore removed the difficulty that arose in the case of Scalpley Hill site, of crossing outside the bridge or under the river with a proposed twenty two inch main.

Burton Reservoir, on the summit of Outwoods Hill, was the first covered reservoir commissioned by the Company. Having a capacity of four and a half million gallons, it was constructed by H. Lovatt of Wolverhampton. The reservoir measured 238 feet by 160 feet by 20 feet deep and at that time was the deepest covered reservoir in Britain. Its sides were brick lined on concrete backing with a puddle clay embankment. The floor of the receptacle was constructed of concrete. Its roof was supported by 155 iron columns, supplied by the Patent Shaft and Axletree Company and was constructed with cast iron joists supporting brickwork jack arches, covered with earth. It was officially opened on 1st July 1881 by the Mayor of Burton, Mr.S. Evershed, in the presence of a large gathering which included the Directors of the Company, Members of Burton Town Council and representatives of the local breweries. Most of the party inspected the interior of the reservoir, where four composite candles had been placed and lit on each of the 145 columns, over 800 candles illuminated what had been a gloomy underground vault, exhibiting the receptacle's full proportions and extent. At the conclusion of the ceremony and on returning to the surface, the Mayor accompanied by Frank James, walked to the crown of the reservoir to open a valve, allowing water to flow in. The party then hastened back to Burton to participate in the hospitality of the Directors, lunch at St Paul's Institute.

The system of supply up to this time might be said to form the original works of the Company.

Contamination of the Lichfield streams.

A water quality problem at Lichfield was brought to the attention of the Chairman and Directors by William Vawdry in 1881.

During a visit to Burton on Trent, he met a Mr. Cartmell an analytical chemist, who informed him he was largely engaged with the different brewers in the town. On analysing the water supplied by the Company he had recently found ammonia present in quantities which rendered the water unfit for brewing purposes. Knowing that Mr Cartmell had been engaged by Mitchell of Smethwick, one of the Company's largest consumer of water for brewing purposes, Vawdry presumed at first that the complaint referred to water in Smethwick. Long lengths of new pipes had recently been laid in the town and ammonia problems were expected for a short time. Cartmell surprised the Engineer when he explained that Burton on Trent was the town where his analysis had been carried out.

Not being able to account for this contamination at Burton in the same way as Smethwick, Vawdry decided to track the source of the Burton complaint and investigate by tracing the Leamonsley, Ashmore and Bourne Brook waters. In the case of the Leamonsley Stream it rose immediately above the old Leamonsley Mill and passed into an old mill pond which was full of mud, weeds and rushes, from there it passed by an open channel through fields till it reached the Museum Grounds, water was then taken into an underground culvert which lead into the reservoirs or direct to the engines at Sandfields.

All the ground through which the stream passed was used for grazing purposes, cattle had access to the stream and in a distance of twelve hundred yards, fifty beasts were near or in the brook course. In the case of the Bourne and Ashmore Brooks, although open streams throughout, the latter ran exposed for a distance of six and a half miles,

Above the intake at Hanch he noted drainage pipes from a few cottages and two or three pigsties, he had no doubt that the discharge was finding its way into the stream. On tracing a tributary of the Ashmore Brook, the Burntwood Asylum was reached, and the whole of the sewage from this large establishment found its way into the stream. A small settling pond into which the sewage was taken, was overflowing, running over land prior to entering a stream which flowed directly into the Ashmore Brook. Continuing on the main stream through Boney Hay, he noticed the bulk of the water came from the direction of the Rawsley Pits of the Cannock and Rugeley Colliery Company. There were many objectionable places feeding the streams and he felt that means should be taken immediately to remove them.

Commencing at the intake at Seedy Mill, there was a farm yard, farmers and millers houses were emptying into the stream plus the effluent from cattle sheds, stables and pigsties. Passing from there in the direction of Longdon Green, although the water passed alongside the highway for some distance, nothing very objectionable was seen, the channel was well cleaned and the water bright and clear, this stream was generally referred to as the Longdon or Lysways Brook. Leaving this and following the Ashmore Brook, there was a farmhouse with the usual cattle sheds and other outbuildings which adjoin the line of the stream, and there was little doubt but that the drainage eventually found its way into the stream. A little further on there was a mill pond belonging to the Farewell Mill, at that time not used, the mill having been burnt down, this pond had several feet of mud in it and although the water was at the time diverted and taken outside, no doubt as soon as the mill was rebuilt the water would again be passed through this dirty pond. About three quarters of a mile further up this stream was a farm called "Little Pipe" where there was an abandoned mill pond through which the water passed, and in which several bullocks were standing.

Henry Haselden the Company Secretary, subsequently wrote to the offending owners setting out in legal terms that the Company, by their 1864 Amendment Act of Parliament, were authorised to construct works and to divert, intercept and impound the waters of the Bourne Brook and its tributaries and off sets. The notices continued, that it was an offence under the 3rd Section of the Rivers Pollution Act of 1876, for any person to cause or knowingly permit to fall or flow, or to be carried into any stream, any solid or liquid sewage matter. In Section 20 of the Act, stream was defined to include water course. Notice was then given to the offenders that sewage was wrongfully permitted to enter the stream. Twenty one days notice was served after which time, if the nuisance had not ceased, then legal proceedings would follow.

Area offices at Burton on Trent and Tipton.

Two of the Company's area offices and stores were commissioned in 1882. Prior to this the first Tipton office, established in 1861, was a room in the house of the local collector Mr. George Whitehead, at Castle Road.

In July 1868 an office and stores was established at 12, Horseley Heath, Tipton, when a terraced house was obtained on a twenty one years lease at £28 per year, from Charles Bills. Responsibility for all maintenance plus repainting the premises every seven years rested with the Company. After two years, the Company was allowed to demolish an ashpit and a pigsty at the rear of the premises and use the materials to build a blacksmith's shop. William Norman, a storekeeper at that time, occupied the living quarters.

Staff numbered 25 in 1865 and included inspectors, turncocks and labourers. There was a choice of waters, when after a small subsidence, a well appeared in the kitchen, William Vawdry ordered that it immediately be filled in.

Tipton Depot is the largest of the Company's area offices. William Trow and Sons of Bilston Road, Wednesbury, built a house, office and stores on land adjoining the Coneygre Reservoir, in Park Lane West, at that time known as the Sedgley Turnpike Road, at a cost of £683.5s.10d. The contract stated that the house was to be completed within seventeen weeks from the contract signing on 7th September 1881. Due to heavy frosts during that winter, building work was delayed, and was finally completed on the 27th April 1882. William Norman, the first tenant to occupy the premises, moved his furniture into the house on 15th May 1882. Up until 1940 the building was used as part offices and part living accommodation for the Tipton Area Superintendent. William Norman Jnr. was the second occupant followed by Philip Kessel and finally Squire Davenport. Today the whole of the Victorian building is used as office accommodation

In 1881, a superintendent's house, office and stores, similar to the Tipton complex was built at Burton on Trent, by local builder Thomas Lowe & Sons Ltd. at a cost of £595. Henry Naden of 54, Livery Street, Birmingham designed the building. Henry Wainwright was in attendance at an auction sale in June 1879, and secured this lot for £50, on which the complex was built:-

Dallow Street, Waterloo Street
and York Street, Burton on Trent
Valuable Leasehold Properties
To be sold by auction

Messrs. Leedham & Harrison at the Star Inn, Burton on Trent, on Thursday, the 26th of June, 1879, at six for seven o'clock in the evening precisely, the following very important-
Leasehold properties, viz.:-

LOT 1

A very eligible PLOT OF BUILDING LAND situate at the corner of York Street and Dallow Street, containing an area of 1011 square yards, and having frontages of 117ft.6in. to York Street and 91ft. to Dallow Street, respectively. This lot is sold subject to an apportioned annual reserved rent of £8 7s.1d. It is an excellent site for business premises, being situate at the junction of four streets.

The offices, stores and superintendent's house were in occupation in June 1882. Extensions were carried out on the office and stores in 1934. Land on which Burton Depot stands was leased from the Marquis of Anglesey, from whom the freehold was purchased in 1962. Land in Dallow Street used for pipe storage was originally leased from the London, Midland and Scottish Railway Company but was included in a larger area of land purchased by the Company from Renolds Chains Ltd. in 1963.

Prior to 1881, the Burton office and stores was located in a barn in Moseley Street. In December 1878, William Shilton the owner, gave the Company notice to quit. William Vawdry's remarks to the Chairman were "Don't bother to object to the notice, the place is just a shade better than nowhere". As soon as the ground in Dallow Street was purchased a wooden shed was erected, from where the staff operated until the opening of the new offices and stores.

Storage tank provided at Cawney Hill, Dudley

Complaints from consumers in Rowley and the higher parts of Dudley in 1884 forced the Company to consider using large tanks to supplement supplies. The Company's solicitor reported that in his opinion small tanks or reservoirs of capacities not exceeding 100,000 gallons could be erected without special Parliamentary sanction. First of these tanks fixed measured sixty feet by forty eight feet by five feet nine inches deep, to supplement a Dudley supply. A piece of land at Cawney Hill, fronting Springfield Road, later renamed Hill Street, with an area containing 1005 square yards was purchased for ninety pounds. Lowest tender for a cast iron tank, was received from The Horseley Company of Tipton who duly carried out the work at a cost of £595. Capacity of the receptacle was 100,000 gallons. Special attention was drawn to the nine inch foundation brickwork, which consisted of eleven continuous walls forty nine feet long, two feet six feet deep. Supply to the high level district was turned on 14th February 1885, the water was pumped from Coneygre Pumping Station by modified engines.

Temporary tanks were also installed at Brierley Hill and Colley Gate, Cradley. At Colley Gate a small plot of land measuring 325 square yards was purchased from a Francis Lea. Installed on this plot in Oldnall Road, was a second hand steam boiler with a capacity of 6,000 gallons, purchased for fifteen pounds.

Similar arrangements were made and works carried out in Brierley Hill, at Bell Street on a plot of ground purchased from D. & B. Green for sixty five pounds and at Pearson Street, where the ground, owned by E.F. Wright, was purchased for two hundred and twenty pounds.

Length of mains laid.

By early 1882, the total length of pumping and trunk mains was eighty one miles, with a hundred and eighty nine miles of service mains.

Chase Terrace supplied.

Chase Terrace was provided with mains and services in December 1881 and January 1882. Supplies of water were afforded the following month.

Water charges based on rateable value.

Dobbs v Grand Junction Water Company, a case decided by the House of Lords in 1883 brought the question of water supply in London, and the price the consumer should pay for water, prominently forward. The case decided that, where the consumer is the owner of the house he occupies, he should pay for the water he consumes at the rate of the net annual value of the premises, and not the gross value which had previously been the custom. Consequently the Company having in their Act a schedule of rates based on the Annual Value, lowered their rates throughout their district in accordance with the principle established in the Dobbs case, charging on the net annual value. There was an exception to this, in Dudley and Burton. Their Acts of Parliament, inherited by the South Staffordshire Waterworks Company, did not include the words annual value, but words everyone understood meant the same, the annual rack rent. Therefore in these two towns the Dobbs decision did not apply which in effect illustrated, shows; a house rented at £9 per year in Dudley, paid under the Dudley Act, three shillings and four pence a quarter, a similar house in Burton under the Burton Act, paid two shillings and eight pence, in the rest of the districts in the area, the charge was two shillings and threepence per quarter, a variation of fifty per cent more for a house in Dudley compared with a house in Walsall.

Deaths of the Company Solicitor and the last of the original directors.

Henry Money Wainwright who had been the Company's Solicitor since its formation, died at his residence in Birmingham Road, Dudley in March 1885 at the age of seventy three.

His long and active life in Dudley, almost covering fifty years, was characterised by fearless, dignified and persevering efforts for what he conceived to be right. In matters educational, social and municipal he was always to the fore. For many months prior to his demise, he had suffered from heart disease, bronchitis and other ailments, but had continued to deal with the Company's affairs up until his last few days, from his bedside. His last letter to the Company is dated 25th of February.

A practising solicitor of long standing in Castle Hill, Dudley, he had played a major part in the formation of the Company along with McClean and Blackwell. Wainwright was born in 1816, third son of Captain John Wainwright R.N.C.B. Lieutenant Governor of the Royal Naval College, Portsmouth. Educated originally at a Military School, he entered the law and was admitted a solicitor in 1836, training in the office of John Benbow, Lincolns Inn, London. In the following year he entered into partnership with Joseph Bourne, a solicitor at Dudley. John Benbow was one of the trustees of the Earl of Dudley and it was through this circumstance that he became connected with the town of Dudley. Benbow was M.P. for the town from 1847 till his death in 1855. In his capacity as a solicitor, Wainwright acted for Lord Dudley's property and as a Parliamentary agent. Among other matters, he was identified with: The formation of the South Staffordshire Railway from Dudley to Walsall which was completed in 1850, and the construction of the canal tunnel running from Dudley Port under the Rowley Hills joining the same water system at Windmill End. This work commenced in 1855 and completed in 1857, was at first strongly opposed by coalmasters as interfering with existing rights in the old tunnel that runs from Dudley to Tipton to Park Head. The scheme was eventually supported and completed as one of the most important public works of the district.

In educational matters he had connections with the Fisher Street School, Dudley, elected President of the Mechanics Institute in Wolverhampton Street and Chairman of the Dudley School Board.

H.M. Wainwright, in 1841, 1842 and again in 1846 was elected Court Leet Mayor for Dudley. The Court Leet existed from times past until the Corporation of the Borough in 1863/64, its actual powers were limited but the person nominated as Mayor was always addressed by that title. His chief duty was to receive requisitions, and call together meetings of the inhabitants to discuss local issues. It was natural that a man of such rare ability, and with such a long and varied experience, in a wide circle of subjects should become the Chief Magistrate of Dudley. After being in the Town Council for many years as representative of St. Edmunds Ward, Alderman Wainwright was elected Mayor in the years 1879 and 1880.

When he believed that any useful or practical suggestion was brought forward for the good of Dudley, Mr Wainwright offered his services. On the other hand he was no friend to anyone who brought forward ideas that he thought were impractical. A case in point was his opposition to the proposed incorporation of the town in the years 1863/1864.

He acted with an influential section of ratepayers who seemed to believe that the incorporation of the borough, would result in a large increase in the local rates without any equivalent in the good and efficient government of the town. Although the incorporation went ahead, Wainwright argued that it would increase the number of policemen from thirty two to forty five and that the inevitable result of the incorporation would be to equalise the town and country rates, thus making the ironworks and blast furnaces at Netherton, pay for paving and sweeping High Street, and finally that the general effect of having a large body of highly paid Corporation officials would be to increase the rates. Speaking of the Board of Health, the body the incorporation was to replace, he was reported as saying that the gentlemen composing the Board were highly respectable inhabitants of the town, but they were never the less, in his judgement, a most incompetent body of men in a public capacity. He then described how the first board of energetic men was elected, and how they were succeeded by a number of persons who got into position on what he called the "economy dodge". He concluded by saying that the Board of Health, if properly managed, had ample machinery for the good government of the town and there was no need to supersede it with a Corporation.

A liberal in politics, he was described as a gentleman of the old school, affable, courteous and genial, respected by all that knew him. It was said that the town could ill spare such a man at that present juncture, and it would be a long time before the list of local public men includes a name so widely known as that of Henry Money Wainwright. He was buried in his native town of Wickham in Hampshire.

In recording his death, the Directors expressed their respect for his energy, ability and loyalty he rendered to the Company from its commencement. Frank James said, their late friend had been present at every one of their meetings. There may have been some differences of opinion between the Board and Mr. Wainwright but he could truthfully say that the deceased always had the interests of the Company at heart. A letter of condolence had been sent to Mrs. Wainwright but nothing they could say or do now would affect the situation, as she died immediately after her husband, but they would like to put on record their regret at the sad event.

With the death of Henry Wainwright there came a deluge of applications for the post of Solicitor. The offices of the Company were now established in Birmingham, subsequently the Board decided that any future replacement solicitor should have offices in the city. Accordingly, Messrs Johnson, Barclay and Rogers obtained office, a position held until the present time. Mr. C.J. Johnson died in 1911 after holding office for thirty six years.

Thomas Eades Walker, of Berkswell Hall, the last surviving member of the original Directors, died in 1887 at the age of 71 years. He had resigned as a member of the Board in 1871 at the same time as John McClean. The life of Walker was identified with the town of Wednesbury, and he accumulated his wealth through his successful development of the Patent Shaft and Axle Works, at Lea Brook, Wednesbury.

The Reverend James Hardy developed a type of iron axle for carts, which proving successful he patented. A small works was obtained and the venture, making Hardy's Patent Axletree, was financed by Samuel Hodgetts, owner of a thriving provisions and grocery business at Toll End, Tipton. After repayment of the loan, Hardy took on four partners and Walker obtained a position as clerk at the works. Lack of finance resulted in the Axle Company becoming indebted to the Birmingham and Midland Bank whose Manager Charles Geach obtained possession of the concern. Thomas Walker was soon installed as Manager and later partner of the Works.

On the death of Geach in 1854, Walker became sole proprietor until it became a limited liability company in 1864. Taking a considerable portion of the shares, he became and remained Chairman of the company until his death.

In 1867 the works was amalgamated with Lloyds, Foster and Company. The works covered thirteen acres of ground and employed four thousand men and boys and paid a quarter of Wednesbury's rates demand. During his early connections with Wednesbury, Walker devoted himself to the public affairs of the town and was one of the promoters of the Local Government Act. He was a member of the Local Board of Health formed in 1851, as an earnest advocate of the movement for bringing water within reach of the inhabitants, investing large sums of money, firstly in the South Staffordshire Mining District Water Company and later in the South Staffordshire Waterworks Company, becoming a major shareholder.

Problems in Sutton Coldfield.

Sutton Coldfield Corporation considered that they had the undisputed right to obtain water from Sutton Park for the purpose of flushing sewers and watering the streets and for general use of the Borough. It had been carefully computed that for effectually carrying out a system of flushing the whole of the public sewers, at that time supplied by water from the Company, a consumption of nearly 40,000 gallons per twenty four hours was required for three hundred days in every year. For street watering an average of 10,000 gallons per day for three hundred days a year, a total of 50,000 gallons each day. The amount paid to the Company for water during the year 1885 was £330 and this was for an inadequate supply to complete the task properly.

The scheme devised by the Corporation was to sink a well, nine feet in diameter, in the immediate vicinity of Bracebridge Pool. There was every reason to believe that a capital supply of water could be obtained by laying down a pipe drain or adit along the north east side of the stream in Pool Hollies Wood below the pool. A pump was to be fixed, within the angle formed by the lower end of the Pool Hollies and the Midland Railway, for raising the water through a six inch rising main, into a storage reservoir on the high ground within the park, adjoining Mr Councillor Wright's property at Four Oaks. The rising main would deliver 175,000 gallons in five hours, the motive power for the pumps was to be a steam roller engine, as this was the cheapest power available, estimated at ten shillings a day.

These charges comprised of, Engine Man: five shillings, Coke and Oil: three shillings, Extras: two shillings.

The proposed reservoir was to have a capacity of 350,000 gallons, sufficient to hold a two weeks supply. Distribution of the water would be by gravitation through 5,200 yards of six inch, 1,600 of five inch, 3,200 yards of four inch iron mains laid along a route from Manley to Wylde Green, and from there to Chester Road with mains also being laid in Park Road, Tudor Hill, Anchorage Road, Hotel Road, Clifton Street, Coleshill Street, Manor Road and Manor Hill. The estimated cost of the scheme was £3,557 which included five and a half miles of main, a storage reservoir, adit or pipe drain, pumps and engine house.

The scheme was debated by the Council, it was suggested at a meeting that in carrying out the proposal they would soon be in a position to buy out the South Staffordshire Water Works Company. Alderman Glover said the supply could be utilised for fire fighting purposes. On the last statement Councillor Griffiths said that with regards to fires it would take a Methusaleh to remember a fire in the borough. (" There was one the other day," "Oh!" then there followed loud laughter). They had been very rare, only one in about forty years, and they could get a fire engine from Aston before they had got the seed potatoes out of their own engine, this remark also caused laughter. He argued the scheme would entail large expenditure if all parts of the borough were served alike. In the present situation it was unfair to burden the poor people with any extra outlay. If Aldermen Glover and Walters had such faith in the scheme he suggested they form a Joint Stock Company and he would assist them in everything but taking shares.

The proposal was adopted by a large majority at a Council Meeting despite strong opposition, a procedure in which they contended they were justified in doing by the 51st Section of the Public Health Act of 1875, an Act which applied to all municipal corporations. This section stated that any urban or rural authority could provide their districts with a supply of water proper and sufficient for public or private purposes, or any of them may,

1. Construct and maintain waterworks, dig wells and do any other necessary acts.
2. Take or lease on hire any waterworks and with the sanction of the Local Government Board, purchase any waterworks, take and convey water within or without their district, transferring any rights, powers, and privileges of any water company.
3. Contract with any person for a supply of water.

The Company admitted that under this section the Corporation would be legally right in procuring water for the objects mentioned above, as they were for public purposes, but the Company contended that under the 52nd Section of the Act, the 51st Section applied only when the Company are unable to or had refused to supply the water.

Rumours circulated in Sutton Coldfield in 1887 to the effect that the South Staffordshire Waterworks had applied for and obtained an injunction restraining the local authority from obtaining water from the park for the purposes of cleansing the streets and flushing the sewers in the borough.

Had the case been tested in court, the Company, it was considered would have had the best of the argument, supported in this belief by a statement made in January 1882 by Vice Chancellor Hall, while delivering judgement in the case of Newhaven Water Company v the Local Board of Newhaven. His Lordship said that the Local Authority were not to throw away the money of the ratepayers in constructing waterworks where there was an existing body which could provide a proper supply without recourse being had to such money, and he granted the Waterworks Company the injunction asked for. A sub-committee of Sutton Coldfield Corporation met and decided to abstain for the present time from procuring the water in dispute. They drew up a case for Queens Council and pending the result the scheme was abandoned.

Typhoid epidemic at Cradley.

During December 1888 there was scarcely a house in the neighbourhood of Cradley Parish Church, in which there was not at least one inmate suffering from typhoid. Five or six deaths had taken place but the epidemic was confined to a particular locality. The sanitary authority suspected a water supply of a public well in close proximity to the parish church. In fact the well, from which the water was drawn by two pumps, was situated underneath the walls of the graveyard. Samples of water were taken and the county analyst at once reported that they contained a very large proportion of vegetable and animal matter and was not to be used. The well was at once closed, or rather the pumps handles were removed, and a standpipe was fixed to the street main of the South Staffordshire Water Works Company.

The well which had caused six deaths and forty cases of typhoid had been the only source of supply for eighty houses. Doubts had been cast upon the quality of the well water for many years, as it was at a point where it was likely to receive the percolation of the graveyard, but it had been declared fit for use up until the epidemic.

A report on the conditions of the town of Cradley at the time stated, "On Saturday it did not look an inviting spot, the roads were in a wretched condition, in some places ankle deep in mud. On one side only of many of the thoroughfares is there an apology for channelling, and the single footpath, where one exists, is of soft soil into which one sinks as he walks along. But the Cradley people, if they are not well dressed, are well shod and they walk through three or four inches of mud with less concern than is often exhibited by Birmingham people, when walking across the damp wood pavement in New Street".

It was suggested that the Birmingham Corporation should retain Cradley as a spot to which people could be sent in the event of them complaining of dirty streets and pavements. Women in the town were in the habit of throwing slops onto the highway, strangers to the town were in danger of receiving the full force of a pail of water, so dirty, that compared with water from the well, would be purity itself. The natives walked in the centre of the road knowing this was the safest place to walk.

A later report on the well water stated that it had been contaminated by drainage from the graveyard. It was found that mining subsidence had taken place and this had broken up the natural drainage channels, sewage matter subsequently was flowing in a reverse direction, into the well.

The 1888 Act of Parliament.

Since its establishment by the Act of 1853 the Company had obtained five other Acts and by the acquisition of the Dudley and Burton on Trent undertakings its operations were affected by the Acts under which these undertakings were conducted. For this reason the Company promoted the 1888 Act of Parliament which was a Bill to consolidate into one Act all the provisions relating to its works. It was considered to the advantage of local authorities and to private water consumers by presenting the powers of the undertaking and the rights of consumers into a form capable of being readily mastered and easily understood.

The Company's water rates were assessed on what they termed as rateable value giving forty different standards in the forty parishes supplied. In order to equalise the rates in Dudley, Tipton, Sedgley and Burton on Trent with the rest of the district, the Company proposed a scale of rating based on the actual rental of the property with liberal allowances for repairs and void properties.

Much opposition to the Bill was encountered in various parts of the district and as a result fourteen petitions were lodged in Parliament. The petitioners were the Corporations of Wolverhampton, West Bromwich, Wednesbury, Walsall, Sutton Coldfield and Burton on Trent, the Local Boards of Darlaston, Oldbury, Rowley Regis and Smethwick, and Messrs. Bass & Company, Alsopp & Company, the London and North West Railway Company and the Staffordshire and Worcestershire Canal Company. The substantial objection urged by the petitioners was that while in some parts of the district the water charges would be diminished, in other parts they would increase. Further objections were lodged on the want of definition.

On 12th March the Bill was brought before the House of Lords, and after making a slight concession the Bill passed the Committee nine days later. Some of the opponents withdrew their petitions. Strong opposition came from three local authorities, the Corporations of Walsall and West Bromwich and the Local Board of Rowley Regis.

There was a long delay before the Bill was passed to the House of Commons where it was passed to Committee on 9th of July. In consequence of the strenuous opposition raised in the House of Commons, and the facts brought out there, the Parliamentary Committee retired to consider the evidence on July 12th. J.W. Lowther, Chairman of the Committee, returned to state that they were of the opinion that the preamble to the Bill was not proved, so far as the question as the scale of rates goes and they understood that that was the chief, in fact, the only matter contained in the Bill. Mr. Bidder Q.C. on behalf of the Company said, " We shall not trouble you any further, Sir, we withdraw the Bill". This left the Company to face costs of £3,500.

Smethwick water praised.

Charges against the Company of supplying water unfit to drink have been many, praises few. This statement of praise has been taken from a booklet, "Remarks on Health", written by William F. Marsh the Medical Officer of Health for Smethwick, published in 1888. This was also delivered as a lecture to the Smethwick Institute.

Having glanced at the personal necessities of individuals, and endeavoured to point out how many deficiencies may be supplied, I will now remind you of two vastly important things that bear a very close relationship to health. I mean water and air. A pure water we already possess, and in such abundance that it has never run short. Whenever I go away from home, I always regretfully miss our South Staffordshire water and am glad to get back to it. I wish I could say as much for our atmosphere, situated as we are with one side of our town bordering on the pure country, we have exceptional natural advantages, our prevailing winds are from South and South West, and in consequence, generally speaking, those who live on this side of Smethwick, enjoy pure air, but when the wind gets to a point or two nearer the West, or blows from any point almost, between that and the South East, we are enveloped more or less in smoke, and breathe an air contaminated by disagreeable and sometimes noxious vapours. This is one of the most difficult questions to deal with in a district where the amount of smoke is a measure of local prosperity and good trade.

Severe winter of 1890/91.

All the districts within the area of supply were affected by a severe winter in 1890/91 when the water mains were frozen. The Company offered to supply water in carts belonging to the local authorities, but the offers were declined when the Company would not provide horses to pull the carts. At Quarry Bank the inhabitants experienced the greatest possible difficulty in obtaining water. The usual necessity of the district was supplied from wells and springs the Company's system being little used. Almost all the wells were frozen over for a considerable time. The existing state of things amounted to a water famine.

At Dudley the high parts of the town, Eve Hill, Constitution Hill, Snow Hill and Kates Hill suffered the most. The Company's mains system failed. The town pumps from which water was consumed prior to laying down of the mains system had been allowed to remain in position in case of emergency were all rendered useless by the frost. The Dudley and Wolverhampton Brewery Company were compelled to cease work in consequence of a total failure of the water supply. At Tipton the canals remained frozen over and work was seriously disrupted. A scarcity of water caused local brewers to close their breweries.

Mines water used to supplement the supply.

With the approach of the summer season of 1891, and the usual serious position with regards to stocks of water, Vawdry searched for temporary supplies. One such supply, was water being pumped at the Moat Colliery Pumping Station in Tipton, belonging to the Staffordshire Mines Drainage Commissioners. At least one million gallons of water a day was being pumped. The water was described as bright and clear, after analysis it was declared safe to drink. The Commissioners were approached to allow use of the supply. A twelve inch main was within a mile and a half of the site, from which the water could be distributed after being pumped direct into the Company's service of supply.

It was ascertained that the Whitley Colliery Company, who owned a mine between Cradley Heath and Halesowen, had discovered a plentiful supply of water at a depth of eighty yards. An analysis of the water showed that it was of excellent quality. Negotiations were entered in to between the South Staffordshire Water Works Company and the colliery company to purchase the supply. Plant was immediately laid down and small tanks were erected to act as reservoirs, which enabled a supply of a quarter of a million gallons of water to be pumped into supply. The depth of the shaft at the Whitley Colliery was three hundred yards, from the sandstone rocks at eighty yards, headings were driven out making half a million gallons a day available. Pipes were laid in various directions and a special effort was made to afford a supply to Rowley.

Increased demand and proposals for new sources of supply.

From the year 1882 until the passage of the 1893 Act of Parliament the district and its requirements had grown considerably. Many mains extensions had been laid to meet the increased demand for supplies, 45,000 houses having been connected to the mains between 1880 and 1893. This brought the number of services laid since the formation of the Company to 81,000. Daily consumption had increased to seven million gallons, and to augment the source of supply to meet immediate requirements, an agreement was entered into with the Witley Colliery Company for a further temporary supply from the springs there, pending the completion of works in hand.

In compliance with instructions from the Board of Directors, Engineer William Vawdry reported, in 1892, on the Company's existing sources of supply and suggested generally the best means to adopt in making provisions for the future, having regard especially to the advisability of securing a supply from the River Blithe where it entered the River Trent at Nethertown near Kings Bromley.

The Company's Parliamentary district at that time covered an area of approximately two hundred and sixty seven square miles with an estimated population of 255,000. The demand on the Company up to December 1891 as regards the supply was barely met by the distribution of six and half million gallons per day, the water being obtained from two wells, at Hednesford and Huntington, the Lichfield tunnel and the two surface steams at Hanch and Leamonsley. This quantity of six and half million gallons per day represented 12.9 gallons per head for the estimated number supplied from these sources, with a further 1.8 million gallons per day used in trade premises.

Sanitary authorities were enforcing a much more extensive use of water for water closets, baths, flushing and other sanitary purposes. With this in mind Vawdry reckoned on the average daily consumption rising to fifteen gallons per head of population by the year 1901, when fifteen million gallons per day would be required, rising to twenty three million gallons per day in 1911.

Allowing for extensions to the existing works, it was possible to obtain a constant yield at Lichfield of four and quarter million gallons per day, at Huntington three quarters of a million, at Hednesford one and a half million, at Fradley one million, at Shenstone one million, anticipating a further one million per day at the new works at Aldridge and Kingswinford, a total of ten and a half million gallons was the maximum yield. From these figures it could be seen that in the year 1901 the demand would be two and half million gallons per day in excess of the yield. Total quantity anticipated was only sufficient for requirements at the end of 1897, it was therefore essential to find additional sources of supply before that date. William Vawdry supported the River Blithe scheme. Samples of water were taken and analysed by William Tilden in October 1891, the report stated, "The colour of the water was brown but the reports of the analysis do not indicate the presence of animal contamination, its unsightly condition is due no doubt to the heavy rains and the presence of decaying vegetable matter".

The details of the analysis given were as follows:-

Parts per 100,000	
Free ammonia	0.003
Ammonia by permanganate	0.023
Chlorine as chloride	2.300
Nitrogen as nitrate	0.030
Dissolved solids including Organic matter	38.600

The water from this source would at all times require filtering. The quantity available from the river was estimated at six to eight million gallons per day. For abstracting five million gallons of water from the River Blithe and conveying the same to Walsall with a reservoir at Barr Beacon, the estimated cost was £310,948. Three other estimates were given for improving the existing works and financial consideration was given to an improvement scheme. The River Blithe scheme was laid to rest to appear again at a later date.

The 1893 Act of Parliament and provision of works at four sites.

The granting of the 1893 Act empowered the Company to raise further capital to the extent of £150,000. Priority was given to completing additional pumping plant, in the course of erection were works at Fradley, Shenstone, Ashwood and Bourne Vale.

Fradley.

This site was owned by Lord Lichfield who was convinced that coal would be found, and for this purpose several years previously, he had a borehole sunk for testing purposes. Although the contractors went down a considerable depth, nothing was found except an abundance of water. This information induced the Company to acquire the site.

Fradley Pumping Station at Alrewas near Burton was constructed in 1891 with the sinking of twelve feet diameter well to a depth of 184 feet, lined with open jointed brickwork, and in 1892 a twelve inch diameter borehole was sunk from the bottom of the well to a depth of 405 feet below ground level. The pump house was constructed by T. Lowe and Sons Ltd. Construction of the two engines was carried out by Hathorn Davey and Company of Leeds. The steam plant consisted of two compound horizontal tandem type engines. No.1 engine was completed in 1894 and No.2 in 1896, with the commissioning of these engines the system of supply to the northern side of the district was altered. Fradley water was supplied to Burton, enabling a larger distribution, from Lichfield to other parts of the district, to be afforded. Four cottages were erected at the Fradley site for the accommodation of the Company's employees.

When the water from the site was made available in Burton on Trent, and whilst the change over from Lichfield water was taking place, supplies to the town were described as deplorable. The Local Authority were inundated with numerous complaints and samples. At a council meeting, samples were lined up to be observed, the one taken from Dr. Rugg's tap was described as, "the colour and consistency of the youthful idea of what pungent water should be." It was passed along the table till it came to a halt in front of the Chairman of the Health Committee who immediately directed it towards the Mayor, his worship declined it with thanks.

In 1952 the steam plant at Fradley was replaced by electric plant. There are two pump units and these consist of a vertical spindle borehole pump and a vertical spindle force pump assembled on one line of shafting driven by a variable speed 150 b.h.p. motor. The pumps were supplied by Messrs. Sultzer Bros. (London) Ltd. and the motor and L.T. switchgear by Messrs. Laurence Scott & Electromotors Ltd.

A softening plant of the base exchange type was installed in 1941 by the Permutit Company Ltd. the building being constructed by Messrs. Thomas Lowe and Sons Ltd.

Shenstone.

The inhabitants of Shenstone had felt some anxiety as to their local well supplies when the Company commenced their operations to sink a borehole in 1891. The Reverend R.W. Essington wrote to the Editor of the Times and his letter was reprinted in the correspondence column;

A WATER FAMINE. TO THE EDITOR OF THE TIMES

Sir, For a harvest, bountiful in this neighbourhood we are thanking God, and we at the same time are enduring a partial famine of something more precious than corn, a famine inflicted by man. For a company which sells water to the black country, is pumping ours to waste. The result to be expected by us is decimation by fevers. Nor will the directors or shareholders be legally liable for these deaths. Perhaps however, the bitter cry of poor creatures who are fetching from a distant brook the prime necessary of life may induce the Houses of Parliament to pause before they allow a firm of strangers to tell helpless individuals that they must sink their old wells as deep as their new shaft if they wish to share those underground streams which were once their own. But this cry will never be heard unless "The Times" echoes it, and makes it impossible for the future, to sink a shaft so near a village.

Shenstone Vicarage. R.W. Essington.

This matter which was of great importance to the inhabitants of Shenstone, was touched upon at a meeting of the Rural Sanitary Authority held at the Lichfield Workhouse, when it was stated that whilst the work of sinking the borehole was in progress the Company were obliged to pump out the water, and that when the operations were finished the water would flow in. Decrease in the water supply, in fact, would only be temporary.

Shenstone Pumping Station, situated on the east side of the Company's area was brought into commission in 1892. The pumping plant contract was running simultaneously with that at Fradley.

The original plant of 1892 consisted of a Hathorn Davey horizontal tandem compound type engine. This simply meant that there were two steam cylinders, the low pressure one working on the exhaust steam from the high pressure (compound), working on the same piston rod one behind the other (in tandem) and that the pumps were mounted on the end of the same piston rod. A second slightly larger unit was installed in 1896. Water was obtained from a twelve feet diameter well, one hundred and thirty one feet deep, with a heading extending five hundred and ninety seven feet. Below the base of the well there was also a fifteen inch diameter borehole, eighty feet deep. The well and the heading were constructed by direct labour and the contractor for the borehole was E. Timmings and Sons. Thomas Lowe and Sons Ltd. constructed the engine house, boiler house and cottages.

In 1957, the original plant was replaced with electrically driven pumping equipment consisting of two submersible sixty horse power well pumps each having a capacity of one and a half million gallons per day. Normally only one pump was in use, the other being a standby. The water was pumped into a 10,000 gallon cistern under the engine house floor where the water was treated with chlorine and from here it was pumped into Barr Beacon Reservoir system by two horizontal booster pumps having a capacity of one and a half million gallons a day and driven by 200 b.h.p. fixed speed motors.

The pumps were supplied by Messrs. Sutzer Bros. and the motors and switchgear by Messrs. Laurence Scott & Electromotors Ltd. As a standby against failure of the main power supply, a Ruston & Hornsby diesel engine driving a Laurence Scott & Electromotors Ltd. 375 kVA alternator was installed when the station was electrified. Cost of the electrification and modernisation was £45,000.

One of the rare fatalities whilst at work occurred at this pumping station on 1st of July 1912. William Shipley, a labourer of 79, Miner Street, Birchills, Walsall, aged 38 years, was tragically drowned when he fell in the well, at the time holding water to a depth of fifty four feet. Shipley had been engaged in creosoting a new cover enclosing the well, he had part completed the work and was lifting the cover in order to finish his task when the accident occurred. The station foreman, George Bird and two other employees checked for signs of the employee and immediately put the two engines to work in order to lower the water level, a drag line was also inserted into the well. Men entered the well to search for Shipley but he was not seen, his body was recovered two hours later, at 3.30pm lying in fifteen feet of water. A Doctor Mansfield and a Police Constable Hall examined the body and stated nothing could be done to restore life.

Shire Oak Reservoir.

In connection with the latter station, H. Lovatt of Wolverhampton was contracted to build a service reservoir at Shire Oak, Walsall on three acres of ground purchased from Thomas Marlow and his Trustees at a cost of £464.

The district is deemed to have been named after an oak tree which stood on the old Lichfield to Walsall Road, marking the Walsall Boundary. The tree was mentioned in documents dating back to 1533, the ancient stump not being removed until around 1890.

This reservoir, original capacity four and a quarter million gallons, was constructed as an open receptacle during 1896-1897 and brought into service in May 1897. The floor consisted of mass concrete on gravel foundations, the walls, also of mass concrete, having vertical water faces and being stepped on the back. Both floor and walls were faced with blue brick. A substantial earth embankment gave support to the walls. In January 1900, cracks, which rendered the reservoir quite useless, developed in the bottom, the movement being due to subsidence consequent upon the working of the colliery at Walsall Wood. Subsidence continued to take place for some time .

Certain reconstruction work, to ensure water tightness, was carried out in 1924 by W.H. Davey and Company, together with the installation of a reinforced concrete cover. Shire Oak Reservoir was taken out of use in 1938, despite a two and a half inch concrete lining being added to the walls to prolong its life. Today the reservoir stands empty but still owned by the Company.

Sedgley problems solved.

The first of the Sedgley Reservoirs was commissioned in 1893. For many years prior to this, the Sedgley and Coseley Local Boards had been urging the Company to lay mains to the central and higher parts of the district. Complaints were made to the Sedgley Sanitary Authority of the inadequate water supply in some districts and non supply in others. In the dry seasons people had been compelled to walk miles for water and on some occasions had fought to get at the springs.

At a monthly meeting of the Upper Sedgley Local Board in July 1885, the Chairman Mr S. Wilkes read correspondence received from the Company, who suggested a meeting to confer as to the water supply of Ruiton and Sedgley. A meeting was arranged and Mr James the Company's Chairman said that it was appreciated that many houses were without water, but because of levels of the district, they could not supply parts of the area with their present apparatus. Mr Wilkes said that the Company were empowered to provide for the district and insisted on some action being taken to rectify matters. It was finally arranged that the Board's Surveyor and the Company's Engineer should canvas the area to list the houses without water and the numbers willing to take a supply. Mr Wilkes stated that if the Local Board would undertake to guarantee the Company ten per cent towards the cost of mainlaying, they would get their water. On asking if the members would undertake to give the guarantee, there was a deathly silence.

It was said there was 400 houses without water in Ruiton, it was also reported there were a lot of pumps out of order in Sedgley. One member said there was plenty of water in the district, owners should be compelled to repair the pumps. There was no water from top to bottom of Gospel End Street, this statement was disagreed with by another member who said there was plenty of the finest water within twelve feet of the surface. Mr Wilkes replied that the well half way down this street had been condemned by the Medical Officer. Mr Jones stated that the well had been noted for its volume and purity for a great number of years. The Surveyor was instructed to give notice to the owners of property to put their pumps in proper order.

Owing to the steep gradients, it had been found impracticable to pump water on to the area. Much of Sedgley and Coseley remained dependant on wells for drinking water, this contributed to twenty six deaths from enteric diseases in 1892, and the sanitary authorities once again made strong representations to the Company, threatening to institute legal proceedings if a supply was not afforded, this resulted in the Engineer, William Vawdry, considering the use of a small reservoir to combat the problem.

A site for the project at Beacon Hill was purchased from Richard Dyott of Freeford, Lichfield, a founder Director of the Company, for £84. 7s. 0d. Ground work for the covered, square shaped, blue bricked reservoir, with a capacity of 250,000 gallons, commenced in 1893, the successful tender of £1850 having been submitted by Jones & Fitzmaurice of Birmingham. The work was completed in November 1893.

Water to the new reservoir was repumped from Shavers End Reservoir by two gas pumping engines supplied by Messrs. Crossley Brothers of Manchester at a cost of £305, which included delivery and fixing. Considered an engineering feat at the time, water was distributed to many houses in Sedgley in December 1893.

Coseley was not afforded a supply from Sedgley Reservoir until three years later. Prior to this, parts of the area were supplied by Wolverhampton Waterworks Company, part by South Staffordshire Waterworks Company and many by private wells. In 1895, the Bill promoted by Bilston Waterworks was introduced in Parliament, proposing to take over supply to part of the Coseley district, complicating boundaries even more. Many of the 350 properties in Cinder Hill and Woodcross were supplied by wells which were becoming polluted by seepages from privies, pigsties and untrapped drains. Coseley Urban District Council favoured the supply being provided by South Staffordshire Waterworks Company from Sedgley Reservoir and this was finally agreed to by the other two parties in 1896.

Sad loss of an Engineer.

William Vawdry who had held the position of Engineer in Chief for thirty years, had been ill at home, 10, Chad Road, Edgbaston, Birmingham, for two months and daily telegrams were sent to the Chairman Frank James, giving reports on his condition.

A telegram of January 3rd. 1895 read;

Frank James, Aldridge.

Vawdry passed away midnight.

Bird.

A.E. Douglas a pupil of the late Engineer was appointed assistant engineer at a salary of £250 a year to superintend the Company's works during Vawdry's illness until the appointment of a replacement engineer, he was ably assisted by J.S. Bird, an engineering clerk at that time, earning £3.00 per week.

Appointment of Engineer.

In January 1895 secretary H. Haseldon was instructed to place advertisements in the "Times", "Engineer" and the "Journal of Gas Lighting & Waterworks", inviting applications from duly qualified engineers for the appointment of Chief Engineer, at a salary of £600 per annum. Seventy applications were received and finally a short list of four qualified persons was selected. W.T. Curry, Assistant Water Engineer, Newport (MON.) Corporation, H. Ashton Hill, Engineer & Manager of the Water and Gas Dept., Wallasey Local Board, W. Mathews, Chief Engineer, Southampton Waterworks, and Thomas Raynes, Assistant Engineer of Birmingham Corporation Water Department.

On the appointment day for the interviews, each candidate was called in and examined by the directors as to capabilities and knowledge. After careful consideration H. Ashton Hill was recalled and offered the appointment. William Vawdry was thus succeeded in office by another engineer sporting a beard, Henry Ashton Hill.

1895 - 1917

New Engineer faces a crisis, frosts, a drought then smoke.

Although assistant engineer A.E. Douglas had taken charge of the works from the time William Vawdry was taken ill until the appointment of a new Engineer in Chief, he did not expect to step into his shoes. At a Board Meeting following Vawdry's death, the Chairman remarked that Douglas had carried out his duties remarkably well, but lack of experience ruled him out of consideration for the position of Engineer in Chief.

The immediate problem of 1895 was a water shortage, it was a period of very great anxiety to the Directors, which became harassing to officials and disturbing to the tempers of consumers. The effect of what was known as the great frost of 1895, was shown in the balance sheet covering the period. Five thousand mains and services were fractured, nine miles of mains were replaced and the Company's officials were considerably harassed and threatened, the Directors were called swindlers, charging for water that they were not supplying.

Several works were in the course of planning and construction at the time of Henry Ashton Hill taking up his duties as Engineer in Chief in March 1895. His first task was to report to the Board generally on the question of the late frosts and particularly as to the cost to the Company. The actual period embraced by the frost was from January 14th to the 10th of March but the effects lasted in an acute form until June 1895. Serious inconvenience was caused to consumers who in many cases had real grievances, with the demand for water far exceeding the capacity of the mains, frost damage to apparatus just added to the difficulties. Taps in open courts or other exposed positions, froze readily, creating further problems. Much was done by the Company to reduce the inconvenience with the sum of £593.14.3. expended in the hiring of water carts. It was found that in many cases mains had been laid at depths of twelve inches to two feet, thirty years previously, by contractors, without proper supervision. All through the period of the frosts the principal mains were kept frost free and fully charged. Extra men were employed but due to the shortage of experienced plumbers and pipe jointers, repairs to mains and services continued well into June 1895.

Additional cost to the Company because of frost damage was accounted for as follows;

Carting	£307.17s.5d.
Materials	£1,722.14s.1d.
Wages	£2,186. 2s.1d.
Damage to meters	£270. 0s.0d.
Water carts	£593.14s.3d.
Standpipes	£22. 1s.0d.
Increased cost of coal	£90. 8s.7d.
Total	£5,192.17s.5d.

Ashton Hill concluded his report;

"Having regard to the probable reoccurrence of such meteorological conditions, say once in fifty years, and to the great cost of laying pipes at extreme depths, I have thought the case for the future would be fairly met by laying all mains at a uniform depth of two feet six inches, from the surface of the ground, to the top of the body of the pipe, and I have issued instructions to the Company's foreman to this effect and in contract main laying, efficient supervision will be exercised". Other recommendations were to increase the stand pipe system of supply and to utilise water carts for outlying districts where mains were frozen, in the event of frost damage occurring in future years.

Following on from this in 1896, there was an extraordinary drought and the existing resources were inadequate to meet the demand so immediate steps had to be taken to increase the yield of water. In June 1896 the average daily consumption was 8,813,315 gallons although the total yield from all sources did not exceed eight million gallons, leaving 820,000 gallons per day to come from storage reservoirs, amounting to twenty seven million gallons during the month. The increase in consumption was due to excessive road and garden watering plus failure of local wells. As an interim measure, negotiations were opened, for obtaining water from colliery workings at Four Oakes, Cannock.

This letter was typical of many written to local newspapers;

NO WATER

To the editor
Sir,

What a lark the waterworks company is having with their customers. Occasionally they take it into their heads to take up or lay down a pipe in the street, and then they turn off the water without notice to the adjacent houses. You should just wait and watch a short time. Mrs. Brown goes to the tap for a bucket of water and turns on, but without success." Confound the tap, what's the matter with it?. It isn't Saturday. What have you been doing to this tap Billy? (a lad of seven summers) "not nothing, I aint". While this is going on Mrs. Smith comes in to say there is something wrong with the tap in her house, and, "will you lend me a bucket until it comes on?". The truth dawns upon Mrs. Brown now, and with innumerable blessings on the water company they go into the street to ascertain the cause of the waterless condition of the pipes, and here they find two other women, arms akimbo, arguing the question with two men in a hole, who say that they won't be more than seven or eight hours before they finish the job, and then they may have as much water as they want, (i.e. until Saturday). Now, Mr Editor, don't you think the company which monopolises the water supply of the town ought to treat its customers a little more courteously?. We have got into the habit of forgiving them for cutting off our supply on Saturdays, although it is the day of the week when we require more water, but we have got used to it, and so make our arrangements accordingly.

Not only do I complain of the irregular supply, but yesterday afternoon I went to get a drink from the tap, (three o'clock p.m.), and I found a most disagreeable taste and smell had got into the water. Did any of your numerous readers notice this, or was it my palate that was wrong?. The water was clear but disagreeable, slightly, very much slightly!. In an hours time we had a change, milk and water without the flavour of the milk.

Yours faithfully,

UNOMEE.

At the meeting of the Wednesbury Town Council, the Gas and Water Committee reported that, like other local authorities, they had received complaints of scarcity of the water supply throughout the borough, and had made an urgent representation to the South Staffordshire Waterworks Company on the subject. During the discussion that followed, Alderman Oldbury said he considered that, as the Company was expending a large sum of money in order to meet the requirements of the town, the complaints might remain in abeyance until the new works had been completed, and the Mayor, while observing that the committee was perfectly right in bringing complaints before the Council, reminded his colleagues that the Company were spending from £2,000 to £3,000 to improve the supply to Wednesbury and Darlaston and that owing to the hot and dry summer, the yield of water from the Company's sources had been curtailed. He did not wish to hold a brief on the subject of the waterworks, but he could not help remembering that South Staffordshire owes them an immense debt of gratitude for the splendid sanitary results which had been brought about by a good water supply. The Company's desire to meet requirements is proved by the fact that they are laying an additional service in the town. In its initial period the undertaking had many difficulties to overcome. Now it stands on the soundest basis, pays good dividends, and its shares are as safe as the Bank of England. Amid all the tendency of legislative enterprise, he did not think the vested interests of water, one of the necessities of life, will ever be affected. With the extensions the Company is carrying out at the present moment, the authorities have no need to complain. What was Wednesbury forty years ago without its water supply, it had to be brought round in huge barrels and sold as a delicate luxury. Then the terrible cholera outbreak, which carried off hundreds of people, was brought about in the main by the deficiency of water and the contaminated sources from which what little there was had to be obtained. Recollections such as these should make us thankful for our present supply.

The emission of smoke from the stacks at pumping stations had on numerous occasions been a cause for complaint from residents in the neighbourhood. Major cause for complaint had been Sandfields when at times court action was threatened. Captain Harrison of Aldershaw, Lichfield, complained of the smoke at Sandfields, furnishing daily reports of the smoke at various times of the day. The reports were couched in somewhat extravagant language, intending to indicate that the chimney was barely ever doing anything but smoke.

His statement was considered by the Engineer to be very exaggerated, in view of the amount of smoke issuing out from the brewery's stacks and the shunting engines on the coal sidings adjoining the pumping station. Consideration was given to installing mechanical stokers but the cost of these and the condition of the boilers resulted in the hand firing method being continued.

A letter received from the Friary, Lichfield in 1871, stated that dense smoke was emitted from Sandfields chimney causing a nuisance and accusing the Company of bad stoking and waste of coal.

Almost as soon as Wood Green Pumping Station was in operation, a report from a local inhabitant stated that " On Sunday the thickest and blackest smoke was seen pouring out of the new chimney at the station". It was further stated that no more flowers or shrubs should be bought for the cemetery if they were to have the neighbourhood invaded by smoke. During 1896, Wood Green Pumping Station was further cause for complaint, and a complainant wrote; " Despite the long continued drought Brunswick Park looks very charming, and although Mr. Pym, (presumably the park keeper,) has not been able to defy altogether the weather, the slopes are greener and the vegetation fresher than they are in any portion of the surrounding district. The beds of stocks are very attractive giving a bright appearance to the whole park and filling the air with delicious odour. Under these circumstances, and considering the state of the weather, Tuesday evening's concert was particularly charming, but there was one drawback. From the stack of Wood Green Pumping Station, volumes of smoke belched forth, spreading over the Park in such a manner as not only to partially screen the sky from view, but to threaten to add a coating of black to the leaves of the trees and to spoil the attire of the ladies present".

Alderman Richard Williams, one of the Company's Directors wrote to H. Haselden and suggested that if the consuming of smoke apparatus, which had been stopped, were put to work again, there would be no smoke or very little as formerly, and he would be doing the public good service. The complainant replied that he was thankful, and so should the public be, to Alderman Williams for bringing his complaint before the notice of the Company. Prompt attention was given to the matter and he had been assured that every effort would be made in the future to spare visitors to the park the eye sore and inconvenience occasioned by the huge volumes of smoke which had at times proceeded from the chimney in question. He wished every other smoke nuisance in the town would receive similar attention. The letter had been unsigned but the handwriting of the Mayor Mr. Naylor, a Shareholder in the Company, was recognised.

Worms in the supply in 1896.

Another letter to the newspapers dated 11th June 1895 read;

Still Growing

Sir,- Noticing in "Table Talk" on Saturday last "Robin Goodfellow's remarks on wireworms 14 inches long in tap water, I should like to say that I have in my possession a creature 23 inches long, drawn from the tap on my premises three weeks ago. It is still alive and active.

Yours truly,
W. Marrigold. Oldbury.

Phillip Kessell, who later became Area Superintendent at Tipton, was sent to investigate the complaint ten days later at The Old Talbot Hotel, Market Place, Oldbury. His report read;-

Sir, The creature Mr. Marigold has in his possession was taken from a bucket of water drawn from a standpipe "wood case" by a Mrs. Berry and put into a bottle by a man named William Fisher, both of Lodge Street. I have seen Mr. Fisher who told me he sold it to Marrigold for sixpence.

Yours Obediently,

P. Kessall

Area office set up at Bridgeman Street, Walsall.

In 1895, a Walsall Area Office and Stores were established when a house was purchased from Charles Holland James, son of the Chairman of the Company, at a cost of £1,000.

Walsall's first store and reporting base during the 1860s was a stable, at the rear of John McClean's house in Park Street. The stable was enlarged and made available for permanent occupation. A change of premises came about in March 1870 when an agreement was reached with Andrew Holmes of Stafford Street, Walsall, a plumber and glazier, for a twenty one years lease of 28, Station Street, Walsall. These were much larger premises with a yard and a right of way to Marsh Lane.

The new premises acquired in 1895 was a substantially built residence, situated at the corner of Bridgeman Street and Pleck Road, Walsall, known as Bridgeman House. Bridgeman Street established in 1836, commemorated the family name of the Earl of Bradford, Lord of the Manor of Walsall.

Bridgeman House was part occupied by John McClean's brother in law, J. Newsome, Chief Accountant of the South Staffordshire Railway, part of the house being used by McClean for training pupils in Engineering. When Bridgeman House was offered for sale by Mr. James, it was regarded as far too good for the locality and as a residence that would not readily find a purchaser except for commercial purposes. It consisted of a double fronted property, containing, dining, drawing and morning rooms, kitchen, scullery, two pantries, seven bedrooms, bathroom with hot and cold water, dressing room, two closets, three normal and one wine cellars. The outbuildings comprised coach houses, and stables for two horses with a loft above the coach houses. The ground was leasehold with 98 years to run and an annual ground rent of £15. In September 1944, at the sale of the Earl of Bradford's freehold ground rent rights, the freehold rights of Walsall Depot were purchased for £400.

Source of supply developed near Kingswinford.

Ashwood Pumping Station, near Kingswinford, became one of the Company's important works at this period, heralding a change in the direction of flow from a source. Everything previously having been pumped from the northern area. After examining geological reports submitted by Messrs. Marten and Witham-King of the Dudley and Midland Geological Society, the Earl of Dudley approached the Directors of the Company and suggested that they sink a borehole on his land at Ashwood. His Lordship was concerned about the number of man hours that were lost due to disease and illness at his works, attributable to poor water supplies. Although it was an expensive plot of land, £2,000 for an acre, it included the mineral rights and hindsight proved it to be a sound investment, when there was found to be an abundance of pure water in the sandstone rock which abounded the district. Initially the land was leased for two years at £250 per year, this was deducted from the asking price at the time of the sale.

Three engines were constructed at Ashwood by Hathorn Davey and Company but in different years. No. 1 engine was completed in 1884, No. 2 in 1897 and No. 3 not until 1904. Eventually there were six boreholes varying in depth from 286 feet to 621 feet sunk in the bunter sandstone. Output from the six boreholes, two being worked by each engine, amounted to four million gallons per day. The working water level of the boreholes is approximately 90 feet below engine house floor level and when standing, the level rose to approximately 23 feet below engine house floor level. Coal to fire the boilers was brought by boat to the Earl of Dudley's wharf at Ashwood Basin.

Electrification of the station commenced in 1958 in the No 1 engine house when the original Hathorn Davey horizontal compound direct acting steam engine, was replaced by variable speed A.C. electric motors, which discharge water into the existing cistern below the engine house floor. After Chlorination the sterilised water is pumped into supply by horizontal booster pumps driven by variable speed A.C. motors.

The pumping plant was supplied by Sultzer Bros. London Ltd. and the motors, switchgear and generators by Laurence, Scott and Electromotors Ltd. the diesel power unit being supplied by Ruston & Hornby Ltd. The water is pumped to Springsmire Service Reservoir, Dudley where part is pumped to Shavers End Reservoir.

The Ashwood works confirmed former engineer Henry Marten's confidence that an abundant supply of water was to be found in the Smestow Valley district. It became one of the most important sources of underground water supply in the Midland area, being underlain by Bunter rocks consisting essentially of red sandstone and part of coarser sandstone with beds of shingle and pebble. The area occupied by the Bunter in the Smestow Valley is estimated to be roughly fifty square miles and the estimated safe yield of underground water from this area is over twenty million gallons a day. Water hardness decreases from North to South down the Valley, with the Southern end being the softest.

Bourne Vale Pumping Station.

The last pumping station, planned by the late engineer William Vawdry, was commissioned at this time. Bourne Vale Pumping Station was constructed by Thomas Lowe and Sons of Burton on Trent in 1894/95, although the site was acquired two years earlier and a well sunk by the Company's own workforce. The borehole was sunk by E. Chapman and Son in 1894/95. The work consisted of one brick lined well 12 feet diameter and 89 feet deep and from the bottom of this well, was constructed a thirteen and a half inch diameter borehole a further 162 feet deep, making a total depth of 251 feet. First class quality water was obtained from the water bearing rocks of what is known as the "Bunter Pebble Beds" which in that district rest on the irregular floor of the coal measures.

At this station, situated at Aldridge near Walsall, the original pumping plant consisted of duplicate vertical compound rotative pumping engines and the steam for driving these engines was supplied by three Lancashire type boilers. First of the two engines was constructed by Harvey and Company of Hayle, Cornwall in 1894 and the second by Fawcett, Preston and Company of Liverpool in 1896. Total engine power was capable of moving two and a half million gallons a day, although the output from the well and borehole was limited to one and a half million gallons a day. Five cottages were erected at the site for the accommodation of the Company's employees.

The original plant was closed down in February 1935, when John Cashmore Ltd. of Tipton dismantled and removed the steam engines. It was replaced by electrically driven pumping plant supplied by Sultzer Bros. Ltd. and consists of two vertical, 13 stage combined well and booster pumps, on the same spindle, driven by British Thomson-Houston 200/70 H.P. Scherbius system A.C. commutator motors and is capable of delivering one and a half million gallons a day against a total head of 430 feet. Electrification and modernisation of this station was completed at a cost of £13,268.

Facts and figures of 1896.

At December 31st 1896, the capital of the Company stood at £1,040,581. 6s. 11d. The water rates for the year amounted to £92,781. 9s. 11d.; the number of houses laid on for the year were 3,634, making the total supplied 92,007. Within the limits of the area of supply were forty eight towns or parishes, containing an estimated population of 565,000.

The maximum quantity of water supplied per day during that year reached 12,233,496 gallons on May 22nd. The total quantity pumped during 1896 was 3,206,000,000 gallons of which quantity 871,000,000 gallons were for trade use. Fifteen reservoirs were owned by the Company, and there were eleven pumping stations; the total reservoir capacity was 195 million gallons, twenty five engines were pumping into supply, fired by thirty nine boilers. The engines in use were of various types, the total actual horse power being 2,700 and included; vertical, rotary, compound, surface condensing; single acting, expansive, beam surface condensing; double acting, expansive, flywheel, beam, jet condensing and double acting, high pressure. The boilers were mostly of the Lancashire type, double flued cylindrical.

Barr Beacon Reservoir.

In conjunction with Bourne Vale Pumping Station, a reservoir was constructed at Barr Beacon. This prominent landmark in the Midland Area, was brought under the notice of the Company, as an ideal site for a distributing reservoir. The name of Barr is said to be derived from "Barah", to eat, sacrifice or to purify. Barr Beacon's history dates far back into the past, long before the Roman Legion marched along the road which lay before it. In ancient times, the site's eminence, caused it to be chosen for the proclamation, by means of bonfires, of druid festivals, which in later periods made it one of the chain of beacons which proclaimed the advent of an invader.

Work on Barr Beacon Reservoir commenced in May 1897 and was completed by March 1899. Main contractors for the construction work, at a cost of £17,573, was George Law of Kidderminster. The site of seven acres of land was acquired, at a cost of £1,250, from Lady Bateman Scott.

On completion, the reservoir occupied three quarters of the site. Built with sides sloping internally, the receptacle measured 410 feet by 310 feet at its margin, and at the bottom, 350 feet by 200 feet, the depth being 21 feet, its storage capacity was ten and a half million gallons. The soil in which the reservoir was built was gravel drift, clay was plentiful in the immediate neighbourhood and this was utilised for puddling the sides and bottom, consisting of eighteen inches of clay, nine inches of concrete and three inches of blue bricks. Due regard was made to safety in relation to the elevated situation and the nature of the soil. The inward slope of the sides was adopted for this reason and the embankments rendered necessary by the varying levels which needed to be much more than ample strength.

A clump of trees, by which the hill was recognised from far and near, outside the site boundary, was not cleared and the view from the ridge was not affected. Early British earthworks, which were still to be traced on the hillside, were not disturbed.

Messrs R & B Bomford of Pitchill, sub contractors for the excavation work, used a novel method of digging. The ground was first loosened by steam cultivators, such as were used by farmers, following upon these, an apparatus was used, the essential part of which was a large scoop, holding approx. a ton and a half of soil. This scoop was attached to a wire rope and was dragged through the soil by a portable winding engine, similar to steam ploughing. Attached to it was a small cab in which a driver rode. Gearing was provided, by means of which the scoop, after being filled and reaching the tipping area, was overturned, and another change of gearing set the scoop clear of the ground for its return journey. This method of excavation, employed twelve men, whereas two hundred navies would have been on site working by the old methods.

Top level of the reservoir is 744 feet above ordnance datum. It enabled water to reach the higher parts of Walsall and West Bromwich by gravitation, areas which formerly received their supply direct from Shenstone and Aldridge. Water was turned on into the reservoir on July 14th 1899.

Three years later, in 1902, the engineer was instructed by the Board, to obtain tenders for covering the reservoir, to ensure the sterility of the water by excluding sunlight and atmospheric pollution. Of the three tenders obtained, the lowest was received from the selected contractor George Law and Company who carried out the work for £12,580.

Facts and figures for 1897 and 1898.

Under the Act of 1875, the Company was restricted from paying a dividend greater than six per cent, until the charges for water in Dudley, Tipton and Sedgley were brought to a lesser scale, that is to say the South Staffs. scale. It was not until 1897 that the change became operable.

By 1898 the capital of the Company had reached £1,100,000. Receipts from domestic and trade supplies amounted to over £100,000 per annum. 3,275 million gallons of water were pumped during the year, an average of nine million gallons per day.

Water pumped at the respective stations during 1898 was as follows-

Lichfield	1,250	Million Gallons
Huntington	456	"
Moors Gorse	179	"
Fradley	380	"
Shenstone	323	"
Ashwood	264	"
Bourne Vale	426	"

Development at Seven Springs, near Rugeley.

Land for Seven Springs Pumping Station, Stafford Brook, Rugeley, was purchased for £282 14s. 2d. from C. Armishaw in 1899. The tenant H. Renshaw of Shooting Butts Farm, grazed sheep on the site. An auction sale of five plots of land in the vicinity of the purchased site was carried out by Messrs Cheatle & Hall. The Company obtaining Plots Four and Five, land which had been allotted under the Rugeley Inclosure Act of 1875.

In April 1901, tenders were received for the erection of a foreman's house at the site, when only two tenders were considered of the four submitted, those of T. Mason of Hednesford £398 and Henry Lovatt £460. The former builder was awarded the contract.

Ashton Hill expressed his opinion that it was desirable to proceed at once with the preliminary stages of establishing the works as it would take at least two years to establish a fully equipped station available for supply. A Director's visit to works in September 1901, confirms that a well and borehole had been sunk and temporary plant installed, at a cost of £6,004. No permanent building was ever erected for the plant which was housed in an extended wooden shed. In all, four boreholes were sunk by the Company and a contractor, E.J. Thompson. The principal borehole used had a depth of two hundred and fifty seven feet, utilising a thirteen feet well. During the First World War in August 1916, under powers conferred by the Defence of the Realm Regulations, the site was acquired by the War office and water was pumped to Brocton Camp on Cannock Chase, via a six inch main.

Instructions were given to the Engineer in May 1920 to make a claim against the War Office for dilapidation etc. at the site and that an application be made to the Defence of the Realm Losses Royal Commission to be heard in support of the same. Plant installed included a "Potters" well pump which had a fourteen inch steam cylinder, four feet six inch stroke, capable of pumping 20,000 gallons per hour at sixteen strokes, plus a Worthinton duplex pump and two portable boilers. An offer of £1,200, later increased to £1,500, was made to the Government, Surplus Property and Disposal Board for the temporary plant, fixed by the War Office.

Water was distributed from the source, by the Company, for the first time on January 12th 1920 when a breakdown occurred at Maple Brook Pumping Station and the last time was in July 1921 when there was a great demand for temporary supplies.

Seven Springs Cottage contained within the 8.95 acres of woodland has been sold but the land has been retained pending a decision on its possible use for a future source of supply, the boreholes remain, capped.

No reason was given for not utilising the supply from at Seven Springs to a greater extent, approximately 500,000 gallons per day, but a letter from Sir Charles Wolseley to the Chairman in 1901, expressing his concern that certain works could interfere with a stream which ran through his estate, was the solution to the mystery.

The letter read;

"For generations my family have had the use of this stream for a mill and various other purposes, covering 600 years at least, and now the South Staffordshire Waterworks come and purchase a little piece of ground at the head of the stream and will at once tap all sources of the stream. I do not for a moment believe that you will knowingly be a party to such a monstrous piece of injustice especially towards an old friend."

Because of the necessity to obtain ground for the development of Brindley Bank from Sir Charles Wolseley it would appear that his wishes were respected, only a small amount of water being extracted from the source.

Proposed purchase of a part of Birmingham Waterworks.

Reports were issued by H. Ashton Hill in 1899 with special reference to the feasibility of taking over from the Birmingham Corporation Waterworks, certain of their existing works, which it was assumed, would no longer be required for their purposes as soon as their Welsh Scheme was introduced, which it was anticipated would be June 1902, and further to indicate the method of utilising such works for the Company's purposes. In order to obtain the information relating to the Birmingham Works, in January 1899, the Directors visited certain of the works of the Corporation and were given every assistance by the Birmingham officials. After careful consideration of the facts, it was decided that the most eligible stations to acquire were; Short Heath, Aston Wells and Plants Brook Pumping Stations, giving a total yield of 6.26 million gallons per day. The scheme proposed, was to deliver the water from the three stations into Upper Witton Reservoir, which would also have to be acquired by the Company, and at that point to erect a re-pumping station to lift the water into Barr Beacon Reservoir.

The Engineer recommended that some communication should pass between Birmingham Corporation and the Company, with regard the proposed sale and purchase of either one or more of the three pumping stations in question. The respective Engineers would have to arrive at a price, and terms would have to be agreed upon between the two parties. These negotiations would take a considerable time and when completed would require Parliamentary sanction.

Birmingham Water Committee made a careful forecast of the probable demand for water and came to the conclusion that it would be advisable to retain, as an emergency supply, that part of the works the Company was interested in acquiring. The retention of these works enabled them to postpone the provision of a third pipe on the Elan Aqueduct. The Committee therefore informed the Company that they not prepared to part with the works in question.

Desperate for increased supplies, the Company compromised, by planning to establish a new pumping station in the neighbourhood of Trent Valley.

This station should, if the works were commenced immediately, put the Company in the position of having in 1902, a surplus of 1,120,000 gallons per day, based upon an annual increased demand of 300,000 gallons per day, and also upon the realisation of an estimated increased supply from Ashwood near Kingswinford. With these expectations of a surplus of water, the proposals to pursue the purchase of the Birmingham Works were abandoned.

Water shortage in 1899.

Drought conditions returned again in 1899. Towns in the Black Country suffering severely from the effects of a long spell of dry weather. The supply of water was poor and the outlook was bleak. The gravity of the situation was temporary intensified by the sudden breakdown of pumping plant at Kingswinford, due to working the pumps at greatly increased speed, putting the whole system of supply on trial. With no mains water available, there was a temptation by consumers, to use water from other sources including supplies from unsafe wells, that had previously been closed down in consequence of their contamination from sewage matter. A long period of disuse had increased the danger of using these wells. Smethwick and West Bromwich were without water for several days, when the supply was restored, on an intermittent basis, there was still no supply from 9 o'clock in the morning till six o'clock at night.

There was a spate of letters to the press including-

SMETHWICK WATER SUPPLY

"Sir, The inhabitants of Smethwick are at the present time being caused considerable inconvenience through the defective water supply. The drought has no doubt upset the calculations of the local water company and put a great strain on their inadequate resources. The water supplied by them is of a very poor quality, and should be boiled before being drunk. Lively members of the insect world are frequent visitors down the water tap and although these messengers may be the delight of the scientists, they are the constant dread of the timid householder whose digestive powers are not of an iron nature. It is to be hoped that the fishing nets at the reservoirs will in future detain more of this unwelcome meat. Municipal control of the water supply of our great towns is more and more every year becoming an absolute necessity. There is plenty of room for improvement in Smethwick and I trust the ratepayers will in a not too distant future reap the benefit of a municipally controlled water supply".

Water carts were utilised for supplying householders with water. Pursuing their "errands of mercy", these carts were surrounded by eager housewives and children, laden with buckets and other receptacles.

On all sides there were deep murmurings and loud grumblings at the inadequacy of the supply and the lethargy of the Company.

Criticism was aimed at the Company, by the public at large, for collecting immense sums of money from water rates, paying large dividends to their shareholders and ignoring their responsibilities to unfortunate consumers, by not making sufficient provision for storage and adequate supplies, thereby causing untold suffering to the poorer classes, great losses to manufacturers and seriously endangering the public health of the community. Local Authorities also received criticism for compelling builders to provide water closets to all new properties, while in the cases of old fashioned privies, which had been condemned, this water system had been substituted, with no water to flush toilets the system was considered likely to cause a grave public health risk. .

The effects of the drought in Dudley caused the Corporation to close the Baths. At Old Hill and Cradley some of the works closed owing to there being no water for the engine boilers. All watering of the roads ceased. Overall, the Company employed twenty eight water carts to distribute water to householders. In market places, dreadful smells were reported from various fishmongers, butchers, greengrocers and other shops where perishable goods were sold, owing to a lack of water to cleanse shops and footpaths. Milkmen complained that they were handicapped through having no water to wash out their churns, cans and other receptacles. Inhabitants of many places formed what was termed as, " Water Protection Associations ". At Dudley Town Hall a conference of Local Authorities considered the water question. It was asked whether there was a law to hang the Chairman, Directors and Officials of the Company as they deserved it, because they were putting the lives of the inhabitants in danger. Copious rain fell over the district on 28th of August 1899, cooling the air and reviving to some extent the half burnt vegetation. The Company was given breathing space.

Sutton Coldfield Depot.

1899 saw the establishment of a Depot at Sutton Coldfield. A cottage of 18th century origin, which up until around 1870 formed part of two cottages built on plot 839, as denoted on the 1810 map of the town, was purchased. From 1760 to 1810 the owner of the property was W. Jesson who died in August of that year. An abstract from his will read; "He gave and devised unto his son Thomas Jesson his messuage, tenement or dwelling house, buildings, farm lands and hereditments situate in the parish of Sutton Coldfield". On December 8th 1810 the will and codicil was proved by Thomas Jesson at Canterbury. In 1823, tenant of the property was David Wilkins, a spade maker, who sublet the cottage to Charles and Thomas Wilkins. The tenants of the premises from 1856 to 1898 were, Isaac Grimley, John Croshaw and later Hannah Crowshaw and George Harris.

The 1851 Register of Electors, recorded the owner of "Freehold houses and land between Town and Blabbs " as Thomas Jesson, Beech House, Ringwood, Hampshire. On his death at Harrow in 1860, the estate was inherited by his son Thomas Jesson who died intestate in 1871 leaving his son Thomas Jesson of Northampton his only son and heir at law.

Alterations had been carried out as by this time the site was described as a house, formerly two, and land at Sutton Coldfield covering an acreage of two acres, three roods, nineteen perches. Railway information of 1871 stated that, area no. 160 on their map, excludes the cottages, but includes the land up to Riland Road. There were two more owners prior to the acquisition of the site by the Company these were Thomas Haywood in 1892 and Bilson, Coal Merchant in 1898.

The cottage at Sutton Coldfield Depot was purchased from Messrs. Jones & Langley, for £380 and initially was used for housing Company employees. From 1900, Turncock G. Fearn was the first Company occupant, in that year he paid a rent of five shillings a week. The building is the smallest of the Company's offices, in 1903 the cow sheds were converted into store room accommodation and were later in use as offices. Additional land at the rear was purchased in 1938 from J. Blackwell, and extensions to the office and stores were carried out and a garage erected in 1939/40. In 1946 further alterations to the premises, Nr 27, Coleshill Road, were made.

Six pumping stations and a reservoir, planned and built.

The South Staffordshire Water Order of 1901, gave powers to raise additional capital of £375,000. It was raised in respect of new works in the course of construction at Hinksford and Trent Valley and stations planned at Brindley Bank, Pipe Hill and Maple Brook. Capital was also required to pay off an overdraft at the bank.

Walsall Corporation objected to the granting of the 1901 Order, submitting that part of the sum of the £300,000 should be devoted to the covering over of Barr Beacon Reservoir and asked for a clause to be inserted in the Order, binding the Company to carry out the work in six months from the granting of the Order, or face penalties in the case of any distribution of water unfit for drinking or domestic purposes. It was contended that since the reservoir had been completed, the water supplied from it had been unfit for domestic purposes, being rendered so by animal life contained in it and a vegetable growth which, owing to the reservoir being uncovered, formed and germinated in the water during the summer months.

The Company denied the allegations of the water being unfit for domestic consumption, but it was their intention to cover the reservoir and that was a reason for which the additional capital was required. They objected however to any clause dealing with the construction of the reservoir or the imposing the suggested penalties on the Company.

Hinksford Pumping Station.

Hinksford near Kingswinford was the second site to be developed in the Smestow Valley. Land was purchased from John Dutton, owner of the Bush Inn near to the site, for one hundred pounds plus a good supply of water, not exceeding 100 gallons per day, free.

Henry Lovatt built the pumping station in 1898, after three old cottages had been demolished on the site. A wharf for receiving the coal was conveniently situated on the side of the Staffordshire and Worcestershire Canal, in close proximity to the station. There was disagreement between the Canal Company and the South Staffordshire Waterworks Company. The canal company feared the pumping operations would drain the springs in the bed of the canal and the water company objected to the canal water polluting the borehole. The well was ten feet diameter at the top, twelve feet diameter at the bottom and was seventy two feet deep. From the bottom a twelve inch borehole was carried down a further depth of two hundred feet three inches.

Messrs. A.C. Potter and Company of Grantham constructed the borehole, the well being dug by direct labour. The pumping plant at this station was in duplicate and consisted of two Inverted Compound Surface Condensing Rotative engines each driving a pair of bucket pumps placed in the well in the centre of the engine house, and a pair of force pumps placed directly under the engines and driven by side rods from the engine crossheads. These engines, constructed by Fawcett Preston and Company of Liverpool, were of the marine type and whereas in a marine engine the side levers were for driving the auxiliary pumps such as air pumps, circulating and feed pumps, in this instance they were utilised to drive the well pumps. Steam for the engines was supplied by three Lancashire type boilers. Pumping commenced at Hinksford in 1900.

Electrification of the pumping plant was commenced in 1949 and modernisation of the station was completed in 1950 at a cost of £18,000.

Today the pumping plant comprises two centrifugal two stage vertical spindle well pumps and two centrifugal five stage horizontal spindle booster pumps. Sterilisation is carried out by the addition of chlorine to the contact tank using a Wallace and Tiernan automatic chlorinator.

Development at Springsmire, Dudley.

In order to deal with the water being pumped from the Smestow Valley a service reservoir of three and three quarter million gallons was constructed at Springsmire, Dudley on an area of land measuring, one acre, two roods, thirty four poles, which was purchased in 1896 from the Earl of Dudley for £800. This followed after negotiations for land at Harts Hill near Brierley Hill and land where today the Dudley Borough Cemetery is sited, did not materialise. Mineral rights for the site were purchased in 1928 from the Earl of Dudley's Baggeridge Colliery Company. Springsmire Reservoir situated at the end of Bull Street, Dudley is a covered receptacle which was constructed in 1898 by Henry Lovatt of Wolverhampton.

It is rectangular in plan being 200 feet long by 150 feet wide. The depth of the water in the reservoir when full is 17 feet and top water level is 602.25 feet above ordnance datum. This reservoir was constructed in mass concrete, the roof being a series of brick arches supported on 98 brick piers.

The undulations of the arch tops were flushed level with concrete and the sides and roof were surrounded by puddled clay. When filled in 1898 the receptacle settled two inches due to the poor nature of the ground, the site had formerly been a colliery. The cost of the works was £14,833. Water was pumped from Ashwood and Hinksford Pumping Stations to Springsmire, from where it gravitated to Kingswinford, Brierley Hill, Quarry Bank, Cradley and Old Hill.

Engine House No.1 and the boiler house at Springsmire were built by Henry Lovatt and Company Ltd in 1901, and two horizontal steam engines constructed by Fawcett Preston and Company, raised the surplus water, not required for gravitation, to the higher reservoir at Shavers End. Pumping commenced at this station in August 1901. A 100 feet by 3 feet 9 inches diameter steel chimney supplied and erected by Hope Gasholder and Engineering Works, Brierley Hill, was presumably used instead of brick, to reduce ground loadings on the site. A letter of complaint was sent to the erection company in April 1901 stating that the chimney was not upright.

Their reply stated; "We cannot understand the chimney not being perpendicular, as it was perfectly upright when our man left it". H. and T. Danks of Netherton supplied the 26 feet long boilers which had a working pressure of 130 p.s.i.

In late 1902 the coal deposits under the boiler house began to burn and the buildings cracked through settlement. The burning coal was dug out and the excavation filled with concrete, in an effort to support the walls. The boilers were then supported on brick columns filled with concrete.

John Dallow and Sons constructed engine house No.2 and provided an extension to the boiler house in 1906. Installation of the engine and high lift turbine pump was carried out by Mather and Platt of Manchester between 1906 / 1909.

Springsmire Repumping Station was electrified in 1928, when two Medivane centrifugal pumps were installed, by Mather and Platt. The Company requested nine contractors to bid for the centrifugal plant which had been installed in 1907, J Cashmore of Tipton successfully bid one hundred and fifty pounds. It was cleared from the site in October 1927.

A reconstruction scheme was carried out in 1937 when two horizontal rotative pumping engines and two Lancashire boilers were removed, this completed the removal of the steam plant except for boiler No. 3 which is still in situ, and the lower portion of the steel chimney stack which also remains in situ. The electric pumps were replaced in 1971 by Messrs. Sultzer Bros.

Trent Valley Pumping Station.

Trent Valley was the site selected for development in the northern area, on ground purchased from the Lichfield Brewery Company for £1,500.

A pumping station was built near to the railway station, by Thomas Lowe and Sons Ltd. Sidings were provided on the Company's property, alongside the railway, for receiving the fuel. Hathorn Davey and Company constructed the two engines at the station, No. 1 engine and the two Lancashire boilers in 1901 and No. 2 engine in 1904. The steam driven plant consisted of compound horizontal tandem type engines. In connection with these engines, four boreholes were sunk, two by E. Chapman and Son and two by Mather and Platt to depths ranging from 460 feet to over 500 feet, giving an output of two million gallons of water a day.

The station was so arranged that a supply of water could be given to the Burton district on the one side and to the Walsall district on the other. Modernisation of the station and the pumping plant was considered in 1957, and a problem with the boilers was foreseen, delaying action for two years. There were only two boilers, and these worked, one at a time, at their maximum capacity, leaving one boiler to steam both engines simultaneously. Added to this the engines were of an obsolete design, badly worn, due for replacement, particularly the force pump and differential gearing and it was impossible to obtain spare parts.

In 1959 the steam plant was replaced by the existing electric plant, using submersible pumps installed in the boreholes, each capable of pumping one and a half million gallons per day. These pumps were controlled from panels in the new booster station and normally only two of these pumps were running. The water was delivered into a 60,000 gallon re-inforced concrete suction tank, where chlorine was added. The booster pumps which draw from the suction tank were installed in the new pump house and are of the vertical spindle type. The booster station, like the original station, was constructed by Thomas Lowe and Sons Ltd. of Burton on Trent.

Pumping stations built at Brindley Bank, Pipe Hill and Maple Brook.

In September 1902, work commenced on sinking the shafts for a new source of supply at Brindley Bank, near Rugeley. The Company's own workmen dug to a depth of thirty one feet at which point the foundation was obtained, thereafter the contractor, E. Timmins of Runcorn, Cheshire moved on site to complete the boring. The two boreholes are 511 feet and 514 feet deep reaching into the Keuper and Bunter sandstone geological formations. Both boreholes were lined with 36 inch diameter solid lining tubes to a depth of 35 feet, and from there, one is unlined 30 inch diameter to a depth of 305 feet, and the other is unlined 36 inch diameter to a depth of 119 feet and thence 30 inch diameter to 305 feet. Below 305 feet deep both boreholes are 18 inch diameter unlined.

Brindley Bank Pumping Station was built between 1902 and 1907, by Thomas Lowe and Sons of Burton on Trent, although the date inscribed over the doorway reads 1905. The building stands on the northern side of Rugeley and is in the style of a Jacobean manor and is reputed to have been designed by Sir Charles Wolseley but no documented evidence supports this claim. Land for the building was obtained on a perpetual lease from Sir Charles. Hathorn Davey supplied and fixed the engine, 90 feet 6 inches long, of the horizontal tandem compound construction.

The H.P. and L.P. cylinders are 28 inch and 54 inch diameter respectively. The flywheel weighs twenty four tons and is twenty four feet in diameter.

The steam raising plant comprised two Lancashire boilers, manufactured by Danks of Netherton, Dudley, each seven feet six inches diameter by thirty feet long giving a working pressure of 100 p.s.i. Coal to fire the boilers came by barge on the Trent and Mersey Canal which ran immediately east of the station. In 1969 the pumping station was electrified at a cost of £23,000. The rising mains, borehole pump components and the steam raising plant of the original works were removed and two Sultzert 8 stage submersible pumps driven by 50 h.p. Hayward Tylor submersible motors, were placed in the wells and these pump the water through the mechanical filters to a 8,000 gallon suction tank. Two Sultzert six stage vertical spindle booster pumps, driven by Laurence Scott and Electromotors variable speed motors, take the water from the suction tank and pump into supply to the Rugeley district.

Pipe Hill Pumping Station, situated two miles from Lichfield, was commissioned in 1903 but was not completed until 1910. The site of two acres was purchased from H. A. Russell a pavior, nine years previously for £507. At this station there were four boreholes; Boreholes Nos. 1 and 2 were 30 inch diameter for a depth of 311 feet and 20 inch diameter for a further depth of 245 feet. Boreholes Nos. 3 and 4, 30 inch diameter for a depth of 303 feet, 18 inch diameter for a further depth of 215 feet in the case of borehole No. 3, and 64 feet in the case of No. 4 and 15 inch diameter for a further depth of 58 feet. The original plant consisted of two horizontal compound tandem surface condensing rotative engines. Number one engine was supplied by Messrs. Hathorn Davey and Company of Leeds and No.2 engine by Messrs. Ashton Frost and Company of Blackburn. The two horizontal steam pumping engines, each driving two borehole pumps was capable of delivering two million gallons of water in every twenty four hours when running continuously at eighteen revolutions per minute. This was from a maximum depth of 300 feet, from two boreholes spaced twenty feet apart and against a head of 433 feet, making a total lift, including pipe friction of 733 feet.

The borehole pumps were of the single acting bucket type, 15 inch diameter by 5 feet 6 inches stroke. They were actuated by compensating levers and rods from the engine crosshead. There were three Lancashire type boilers made by Messrs. H. and T. Danks of Netherton, Dudley, each 8 feet diameter by 30 feet long, with a steam pressure of 110 lbs. per square inch.

Fuel to fire the boilers came by canal, a wharf having been built by C. Smith of Tipton for £218. Birmingham Canal Company charged the Company one pound per year for an easement allowing use of the wharf and one penny for each ton of coal unloaded. H. Lovatt and Company Ltd. of Wolverhampton were the contractors for the buildings, which included a cottage for the engine foreman. The yield of two million gallons a day from the four boreholes was pumped into Barr Beacon Reservoir.

This station was electrified and modernised in 1973 at a total cost of £155,100.

Today there are four Sultz vertical spindle borehole pumps and two Sultz vertical spindle booster pumps installed. The borehole and booster pumps are driven by variable speed motors of Laurence Scott and Electromotors Ltd. manufacture.

Maple Brook Pumping Station, in the parish of Burntwood, commenced in 1908, was the last of the works allowed for by the 1901 South Staffordshire Water Order. The buildings, including the cottage, were erected by B. Whitehouse and Sons of Birmingham and were completed in 1914.

Messrs. A.C. Potter and Company were responsible for the sinking of the four boreholes, Nos. 1 and 2 in 1912 and Nos. 3 and 4 in 1922. The plant installed was named after the Engineer and Chairman of the day. It consisted of two vertical triple expansion Corliss surface condensing rotative type engines, with flywheels at each end between the engine and the borehole pumps. Each engine drove a pair of borehole pumps, the H.Ashton Hill engine, installed in 1913, drew its supplies from boreholes Nos.1 and 2, sunk to a depth of 670 feet. This engine was supplied by Messrs. Galloway Limited of Manchester and cost, together with it's associated boilers and plant, ú16.165. The engine weight including borehole and force pumps was around 320 tons.

Messrs. Glenfield and Kennedy of Kilmarnock were responsible for the H. K. Beale engine, erected in 1922. It drew its supply from boreholes Nos. 3 and 4, sunk to a depth of 633 feet. Six and a half tons of coal per day were consumed by the Galloway engine which has been preserved for prosperity. Its dimensions are -

H.P. Cylinder	22 inch diameter.
I.P. Cylinder	35 inch diameter.
L.P. Cylinder	55 inch diameter.
Stroke	4 feet
2 Borehole Pumps each	15 inch diameter by 5 feet stroke.
Force Pump Plungers	13 inch diameter by 4 feet stroke.

Each engine was capable of pumping two million gallons per twenty four hours at a speed of twenty revolutions per minute from a maximum depth of 300 feet in the boreholes, and a head of 306 feet on the force pumps, making a total head of 606 feet including friction.

The boilers were of the Lancashire type made by Messrs. Galloways Limited and were 8 feet diameter x 30 feet long. These were fitted with Sugden's superheaters and the necessary valves were provided so that saturated or superheated steam could be used. The working steam pressure was 160 lbs. per square inch and the temperature at the superheaters was normally about 550 degrees Fahrenheit.

Maple Brook Pumping Station was electrified in 1972. Prior to the shutting down of the Galloway engine, electrical pumping plant was installed. It comprises of four 7 stage Sultz submersible borehole pumps driven by Hayward Tyler fixed speed, 90 B.H.P. motors.

The two booster pumps comprise of Sultz vertical spindle, mixed flow, 4 stage units driven by Laurence Scott & Electromotors Ltd. 195/78 B.H.P. variable speed motors.

Fifty years on.

The 100th half yearly meeting of shareholders was held on the 26th March 1903 at the Company's offices in Paradise Street, Birmingham. All the Directors; Mr. Frank James, Sir Henry Wiggin, Alderman C.G. Beale and Messrs. G.H. Cloughton, William Evans, F.H. Lloyd and Richard Williams, together with G.J. Johnson as solicitor were present, but very few shareholders attended to celebrate the jubilee.

The accounts showed that 2,262 houses had been added during the year to the number supplied, which was 117,035 and the gross total of water rates rose from £58,292 to £60,503. The Directors recommended the addition of £2,000 to the depreciation fund, raising it to £17,276 and this left a distributable surplus of £26,357. Out of this they proposed to pay a dividend of six and a half per cent.

Frank James, after moving the adoption of the report and balance sheet, pointed out the large number of houses added to the Company's list showed the importance of carefully watching the growth and development of the district.

After explanations on the half years workings, Frank James recollected the past fifty years. " This was their jubilee year, he could recollect the time of starting in 1853, although he was not connected with the Company in its first two years of its existence. What a transformation scene it had been, when they went to Parliament in 1853, for a capital of £160,000. Who would have thought that in fifty years they would have arrived at a capital expenditure of a million and a quarter pounds and still be going on. However there was the fact that it was 1860 before a modest dividend, one per cent, was paid. All waterworks must expend their capital before they could get any return at all. After going through many difficulties he was happy to say better times were ahead. He could recollect when the Directors had to go to their bankers to give their personal security for the charges necessary to carry on and also the time when the shares of the Company were at a considerable discount, not worth one half what they were that day. In 1872 their capital was £390,000 and a dividend of three and three quarters per cent was paid. In 1882, capital was £785,372, dividend was four per cent, in 1892 the figures were £939,000 and five and a half per cent. That was most satisfactory progress and based on thirty years experience. He could say as their old friend Mr. McClean used to say, I do not care a straw how much capital you spend so long as that capital will produce revenue. The Company had started at Dudley in 1853 when the idea was conceived by John McClean of getting water from Lichfield to supply Dudley. The start of the Company was of a philanthropic character and throughout that period I have seen it grow from a little thing then to the great thing it is now".

A letter to the correspondence column of " Truth ", dated 26th February 1903, read -

Candidates for the Upper House.

Sir,

I have read your articles in Truth on antique Directors with much interest.

I now enclose you a copy of the " Report of the South Staffordshire Waterworks Company Limited " which it is only fair to say is a comparatively well managed affair, although the Directors' age is over seventy, three of them being octogenarians and one of them eighty six. My point is, and I think yours also, that it is hardly fair for gentlemen of this age to accept fees for work which obviously they cannot perform. They are all rich men who do not want the fees and are in all probability keeping out younger men of greater ability. It is not necessary for me to tell you that they are, most of them, more or less, blind and deaf.

Yours truly

February 14th. 1903

KENILWORTH

Following on from this, a newspaper correspondent drew attention to the remarkable fact that by far the greatest and most important of the public work in this district was done by men who have passed the age allotted by the Psalmist. He instanced three Directors of the South Staffordshire Waterworks Company, each of whom was still a tower of strength in all public matters, namely, Mr. Frank James, Sir Henry Wiggin and Alderman Richard Williams. The aggregate of these gentlemen's ages he did not know, but he guessed it to be 250 years, with very few of those years not having been filled with work for the national and local good. With regards to the waterworks they have put in plenty of time. Any one of them could give points in energy and activity to many a younger man, and certainly their abilities and experience was invaluable.

Cannock Depot opened.

During 1904, the Company decided to establish a stores and depot in the Cannock area, near to the town. Prior to occupation in early 1905, Huntington Pumping Station was in use as a stores and reporting base. This venue was situated one and a half miles from the town. Men reporting for duty each day were required to walk to Huntington, then return back to Cannock to carry out the majority of their duties which the Engineer considered was time wasting. Cannock Area Office and land was purchased for £650 from Thomas Evans of Hednesford. The site was considered suitable for further development and at varying stages a vehicle and repair workshop, stores and mess room were established.

The Company's first water tower built.

When a site for a service reservoir cannot be found at a sufficient elevation to command the area of supply, an elevated tank, sometimes enclosed within a brick tower, suffices. The first tower provided by the Company was at Winshill.

In the early part of the 1900s, wells at Winshill near Burton became polluted with sewage and were condemned by the Public Health Officer. The incidents which accentuated matters and stirred the town council committee to action, were the reported cases of typhoid at Lincoln and Maidstone.

Because of the height of the district, the existing South Staffs. supply from Outwoods Reservoir, was only available on the ground floor of two hundred houses while seven could not be reached at all.

Outwoods Reservoir was 319 feet above Ordnance Datum while a considerable portion of Winshill was above that level. It was obvious that water could not be supplied to Winshill and only in exceptional cases could a supply be afforded to houses between 300 feet and 319 feet above sea level. In consequence of this, the supply was totally inadequate for domestic and fire fighting purposes. The Company was under no legal compulsion to supply water to a higher level than their reservoir at Outwoods, Burton on Trent. Recognising that their supply was not adequate the Company's solution was to suggest erecting a tower at Moat Bank and fixing pumping equipment at the rear of the Anglesey Arms, in order to raise water from the mains to a water tower. This proposal to supply the higher parts of Winshill was conditional, subject to a contribution of £1000 being made by the local authority towards the £6,500 required to carry out the work.

A council meeting was held on 23rd of November 1904 at which the Mayor, Alderman T.E. Lowe, presided. Despite a certain amount of disagreement regarding the contribution of £1,000, a vote was taken and the scheme was approved by twenty two votes to nine. A report in the Burton Mail read; " The Town Clerk read the suggested agreement, the phraseology of which was so technical as to be incomprehensible to the lay mind". The Corporation approached the Local Government Board on the subject of a loan for £1,000 and received a favourable reply, conditional on a agreement being entered into with the Company. Delay in starting the work was attributed to difficulty in obtaining a site, residents not desiring a tower sited near their homes. After much debate agreement was reached in 1905 and land was purchased, for £96, near Waterloo Clump, a site where trees had been planted to commemorate Wellington's victory. Building work, to construct the water tower and pump house, was started in 1906, carried out by local builder Thomas Lowe and Sons, and was completed in 1907. Built like a Norman keep, in brown brindle brick, laid in old English bond, the tower, 96 feet 6 inches to the parapet, is situated four hundred and five feet above sea level.

Within it, an 11 feet 3 inch high cast iron tank on a 28 feet square grill of rolled steel joists, holding 10 feet three inches of water, was supported by a pier which itself extended to 80 feet above ground level. The capacity of the receptacle was 50,000 gallons with a total weight of 225 tons.

The tank was made by Newton Chambers of Sheffield at a cost of £584. Originally only one pump, a single stage centrifugal pump, made by Mather and Platt of Salford, was installed, this was driven by a 10 hp single phase semi-enclosed motor made by Rhodes Motors Ltd. of Doncaster. Water was distributed from the tower on 1st of August 1907.

A newspaper report after completion of the tower stated that a councillor had received complaints to the effect that the Union Jack was not hoisted at the tower on Trafalgar Day. He replied to the criticism by stating that it was the responsibility of the Company and they were too poor to provide a flag.

Rumours of the Company being offered for sale.

In July 1906 a Mr Widdowson of Widdowson and Church, Auctioneers, Valuers, Surveyors and Estate Agents, Union Passage, Birmingham wrote to the Company with what was described as a bona fide enquiry to purchase the Company. This was followed up by a visit to the Company's offices the following month and subsequently a further letter. Mr Widdowson stated that he had seen two of the proposed parties, who represented the proposed purchasers of the undertaking, which he understood was to be put on the market as a going concern, but before he was prepared to name the parties, the question of his remuneration must be considered as he was not receiving a fee or commission from the proposed buyers. Mr Widdowson's opinion was that he should be paid in cash a commission of two and a half per cent if the sale went through.

Secretary G.J. Sparrow replied that the matter had been laid before the monthly Board Meeting and informed him that the " understanding that the Company was to be put on the market, has no foundation in fact, on the contrary the Directors have never entertained any such idea nor has it ever been suggested to them except by your letter".

Requests to visit the works of the Company not allowed.

Section 61 of the Waterworks Clauses Act of 1847 refers to the penalties for causing the waters of undertakings to be fouled by bathing, washing, throwing, or causing to enter any dog or other animal, throwing in any rubbish, dirt, filth or other noisome thing, washing or cleansing therein any cloth, wool, leather or skin of any animal. This section was no doubt in Frank James's mind when he refused the numerous requests from consumers to visit the works of the Company. He was publicly thanked for the fine stand he made against the requests of inhabitants of Lichfield to allow skating on the Lichfield Pools in 1907.

In refusing permission he said he might at once say that what was asked was just one of the things they could not permit. The water in the Lichfield reservoir was drunk at other places, and not at Lichfield, and the Directors had to do everything they could to prevent contamination. There was a danger from cigar and cigarette ends, tobacco from pipes, and greasy papers from sandwiches which skaters took with them. All these things made it absolutely necessary for the directors rigidly to say "No" to the application for skating. He could recollect the time when the reservoir had to be absolutely closed, and on many occasions they had to draw lines which might appear to be hard, but were necessary. Invalid chairs were permitted, but if one perambulator was permitted all would have to be. It was thought that he would not dare to refuse the wife of the Bishop of Diocese permission, but as Chairman of the Company he hardened his heart, as an individual he should have said "Yes" a dozen times, but when he knew that he was protecting the interests of the proprietors and also of the consumers of the water, he had to draw the line and tell the Bishop's wife her perambulators could not be allowed, and none had been allowed since.

Frank James stands down as Chairman.

Three changes occurred in the Chairmanship of the Company during the period 1908 to 1916, the first of these when Frank James, D.L. J.P. decided to stand down in 1908. Staffordshire has never lacked public spirited persons, ready to assist or carry out administrative and judicial affairs of the county. One such person was Frank James, referred to affectionately as "The Grand Old Man Of Staffordshire". He was the fifth son of John James, an ironfounder with premises in Ablewell Street, Walsall, born on the 8th of November 1821 in a large double fronted house which divided the works of Thacker and Sons and H. Frost and Company in Fieldgate, Walsall, at that period the residential part of the town. In 1826 he was sent to school in Handsworth, Birmingham where a sound education was received at an establishment administered by the Reverend D.N. Walton and later completed his education at Kings College, London.

Returning to Walsall, aided by his father, he found employment in the Walsall and South Staffordshire Bank situated at The Bridge. Frank James's career as a bank clerk was brief. After a little persuasion John James agreed to allow his son to emigrate to South America and for four years Frank James was employed in the American Embassy in British Guyana as an apprentice clerk. By 1840 he had become homesick and had returned to his native town. Following his fathers advice, he joined the family ironfoundry business where he learned the rudiments of the trade.

In 1842 the Chartist riots seriously affected parts of the Midlands, especially the Potteries and at Gold's Hill, where the rioters destroyed considerable property. Frank James enlisted in the Walsall Troop of the Staffordshire Yeomanry who had been called upon by the civil authority for help in quelling the disturbances. Reminiscing in later years about his Army career, he recalled one proud task, that of forming part of an escort for the Duchess of Gloucester travelling from Sandwell to Birmingham.

The James Foundry Company was founded by Frank James in 1845, in what was later to be called Bridgeman Street, Walsall. The plot of land was acquired from the Earl of Bradford on a 99 year lease. Railway keys, drays and items in the saddlery trade were produced at the works which existed until 1906. James was described by his workers as rough in his manner but kind hearted by nature.

In 1848 further land was leased adjoining the works, and Bridgeman House was acquired on the corner of Pleck Lane. The house was later purchased by the South Staffordshire Water Works Company for use as a local stores and depot and it remained in use for this purpose until 1980. Today Bridgeman House is occupied as office and factory units.

Twice married, Frank James had nine children, outliving all but three of them. His first marriage took place on 5th March 1845 at Aston Church to Ann Wells Ingram who was the eldest daughter of a well known Birmingham businessman, Thomas Wells Ingram. The five children of the marriage were Harry, Emily, Frederick, Arthur and George James. Ann James died at the early age of 36 in 1858 and Frank James remarried at Fulham Parish Church, London on 3rd November 1859.

His second wife was Mary Emma Holland who was the youngest daughter of Mr and Mrs William Holland of George Street, London. William Holland was an associate of the well known London Architect, James Walker. The first Engineer of the South Staffordshire Water Works Company, John McClean, served his apprenticeship and early working career with James Walker and through this association came the introduction of Frank James to Mary Holland. There were four children of the marriage, Frank, Charles, Herbert and Victor Holland James.

Frank James's involvement in local affairs began in the 1850's with an important role in the development of the "Pleck" district of Walsall. Schools were a top priority and he was mainly responsible for a scheme which resulted in their development. Other educational involvement included the Science and Art Governorship and the Chairmanship of Queen Mary's School plus the Presidency of the Literary and Philosophical Institute. In 1870 the Forster Education Act was passed to provide educational opportunities for every child between the ages of five and thirteen. In places where existing school's were unable to provide adequate accommodation, School Boards were set up to supply additional schools. Frank James became a member of Walsall's first School Board.

He was a regular church member taking an active part in affairs, records show he was a churchwarden at the Parish Church in 1855 and a founder member of St. John's Parish Church which was built in the late 1850's. He was a committee worker when the foundation stone was laid in April, 1857.

Walsall's Union Workhouse in 1856 was a large Elizabethan style structure in Pleck Lane, its affairs being administered by the Board of Guardians.

Frank James served on this body for six years, part of this time as chairman. The building housed four hundred and fifty inmates many of whom, he was quoted as saying, "brought to the state of pauper by the law itself".

His association with the South Staffordshire Waterworks Company lasted for sixty five years, establishing a record of service which will probably never be exceeded. Frank James's interest in the Company began in 1857 when he became a shareholder. The following year he was present at the inauguration ceremony when Lord Ward started the engines at Sandfields, Lichfield which resulted in water being pumped to Walsall Reservoir. In 1859 he was elected an auditor of the Company, resigning this position to become a Director in January 1861. After the death of Richard Jesson in 1872, he was elected Chairman, a position he held until 1908 when he was obliged to resign because of increasing deafness. He was not allowed to resign his directorship which continued for a further sixteen years. When he joined the Board there were 4,600 houses supplied with water producing a rates revenue of £5,139. per annum. On his retirement as Chairman, the totals had increased to 133,758 houses and a revenue of £142,562.

In recognition of the assistance he rendered the Company, he was presented with a testimonial to the value of five hundred guineas in 1896. From 1858 to 1908 he attended every half yearly company meeting. As a Director, he was absent from only three monthly meetings, and on one of these occasions he was in London appearing before a Parliamentary Commission representing the Company's interest. In 1916 he missed his first Annual Meeting having been present at the preceding fifty-five events, a remarkable record of service.

Walsall's St. Matthews Lodge of Freemasons was launched in 1847 and its progress was no doubt due to the influence and ardour of the James family. As a Freemason, Frank James held another remarkable record of service, initiated into the Lodge in 1848 he was a subscribing member for seventy three years, serving as Provincial Grand Secretary 1860-1865, twice holding the office of Worshipful Master. In 1921 he was appointed Past Senior Grand Deacon. He was also the founder of the Staffordshire Masonic Charitable Association of which he eventually became President.

Politics gave him both pleasure and disappointment. A supporter of the Conservative and Unionist cause, he stood as a candidate for Parliament, to represent Walsall, three times. In response to an organised petition signed by 4,000 constituents in 1865, he was adopted as Conservative Candidate to fight the election against Charles Forster, a Liberal who had successfully held the seat for the previous twenty eight years. Frank James, never optimistic about the result, lost by 5,112 votes to 3,435 votes, hundreds less than the signatures on the petition. Sir Charles Forster died in 1891 and at ensuing by-election Frank James fought the seat against Edward Holden, only to lose again by 500 votes. Following the General Election of 1892 after gaining the seat from Edward Holden by 5,223 votes to 4,090 votes, James was to lose on appeal.

Some years later, he recalled the incident saying "Great indeed were our rejoicings and numerous and hearty our congratulations but, alas, they were short lived. Our opponents, smarting under what was to them, so unwelcome a defeat, moved heaven and earth to find means of annulling the decision of the electors".

Examining the returns and election expenses, it was discovered that two pounds eighteen shillings had been paid for photographs, which, unfortunately, had been described as hatcards. Other charges made included bribery by paying for drinks after meetings. The trial was held at the Guildhall, Walsall, November 15th to 18th 1892. Large crowds lined the streets to witness the arrival of the Judges. James was the victim of indiscreet supporters and an inexperienced agent who happened to be his son Victor. It was proved that payment had been made to the agent for cards and badges for James's supporters and this was adjudged illegal under the Corrupt Practices Act of 1883. Frank James was therefore unseated and ordered to pay costs of this unusual court case. He was not involved in Local Government, objecting to party politics being introduced into local affairs. However, after moving to live at Portland House, Aldridge, he served on the local Parish Council as Chairman.

For many years he presided at Rushall Court, where his administration of justice was marked by tact and common sense. One of his many comments was "Take little notice of the law, find equity, show kindness and use sense". From 1873 to 1908 he served at County Quarter Sessions. Before the Local Government Act, magistrates were responsible for the administration of the County finances, roads and other public matters.

Frank James was elected to Staffordshire County Council and the County owes much to him for its early progress and development. He was Vice Chairman for many years and subsequently became one of the first County Alderman in 1890. Two years later he succeeded Lord Harrowby as Chairman and was also Deputy Lieutenant of the County.

An instigator of the Chambers of Commerce was Sampson Lloyd who called a meeting to promote the idea in Birmingham in 1880. Frank James attended the gathering, and with his business sense and realisation of the necessity for local traders to combine, in order to safeguard their interests, he took a prominent part in the formation of Walsall's Chamber of Commerce of which he became first President in 1881.

Because of increasing deafness he retired from many of his pursuits in 1906. He chose to spend his final years at Cuttlestone House, Penkridge after residing at Silkmore Hall, Stafford for a period.

On July 11th 1913 at the age of 91 years he received his greatest accolade when, in recognition of valuable work in both town and county affairs, he received the Freedom of Walsall. The scroll and casket, housed today at a Freemason's Lodge in Aldridge, were presented to him by Sir Edward Holden his old parliamentary rival.

In his reply at the Freedom ceremony he said "Many of you will remember the words of an old song, What is the use of glory if you cannot hear what people say ", obviously drawing attention to his hearing deficiency.

Although a nonagenarian he arrived early for January meeting of the Company, in 1915. One of his fellow Directors remarked at again meeting Mr. James; " men may come and men may go, but he goes on for ever". He and his wife Emma celebrated sixty two years of marriage in 1921, but she died soon afterwards. In 1921 on attaining his hundredth birthday he received the customary telegram from King George the Fifth.

A life crowded with interest closed quietly in the early hours of March 23rd 1924 when Frank James died. His life was summed up by Vicar of Walsall, the Rev. B.F. Relton, in his address to the congregation; "Although the length of life is a gift from God that is not equally distributed, the gift is given to be used wisely and well. Frank James was one whose gift of life was a great one, using it not for his own advantage but for others, using his time in promoting the welfare and happiness of others". His funeral service was attended by representatives of all the public authorities, associations and societies with which the deceased had been connected during his long distinguished public and business career. A simple designed coffin containing his remains was carried the short distance from Cuttlestone House, along the lane, to it's resting place under the shadow of the ancient tower of the church at Penkridge, where he was laid to rest.

New Chairman elected and the important 1909 Act of Parliament.

Following the resignation of Frank James as Chairman in 1908, a position he had held for 33 years, Charles Gabriel Beale was elected in his stead. C.G. Beale had been a Director of the Company since 1896 and as Chairman he subsequently had to negotiate the very difficult proceedings of the 1909 Act of Parliament. Parliamentary powers were obtained in 1909 to raise further capital of £80,000, which was needed mainly to finance compensation claims brought about by a by a court ruling in a waterworks case. It was the case of the Attorney General versus the Frimley and Farnborough Waterworks Company, when it was contested that a new well or borehole constituted a new works for which powers for construction were required.

The South Staffordshire Waterworks Company, like many other companies, bought land by agreement and constructed their works. The question before the courts was whether the Company, under the provision of Acts obtained, was entitled to sink wells on the land. The courts held that all they were entitled to do was to construct works which were ancillary to the supply of water. Eleven pumping stations had been erected by the Company without obtaining specific powers and it was therefore necessary to have the construction of these stations confirmed. This opportunity to oppose the Company in Parliament was seized upon by local authorities.

The 1909 Act was subsequently opposed in Parliament, and for the first time in the Company's history, compensation clauses for water were demanded and granted. The clause read;

"If any diminution has taken place or shall take place, in the supply of water from any well, borehole, pond, spring, stream, or watering place which existed or has existed as an effective source of supply, at or since the date when pumping by the Company first started, at any pumping station by this Act authorised or confirmed, within a radius of two and a half miles from that station, the Company, shall on written request of the owner, afford a supply equal to the amount of the diminution".

This clause created a big liability on the Company when compensation was claimed on diminution of supplies caused by stations built twenty years beforehand, and great difficulty was experienced in disputing cases where diminution was not due to the Company's pumping. Liability of proof and limitations to the protected area, were subsequently altered.

Twenty nine petitions were filed against the Company's Bill being promoted. The Company intended to seek powers to develop a site at Prestwood near Kinver under the 1909 Act. A petition against this portion of the Bill was filed by Stourbridge Water Company who maintained that the supply to their Tack Pumping Station, Wordsley would be affected. The Great Western Railway Company objected to the line of the pipework to Shavers End Reservoir, the proposed route extending over their Kingswinford Branch Line and the Stourbridge Extension Canal near Shutt End by means of bridges which were the property of the petitioners and were maintained by them.

It was resolved that in the opinion of the Directors it was not desirable to proceed with the Prestwood Scheme for a new pumping station in their application to Parliament, so this proposal was put on ice for thirteen years.

Burton on Trent petition against the Bill, regarding the water charges, was settled on a clause reducing the charges to the ordinary South Staffordshire level as from 1st July 1912.

Seisdon Rural District Council provided a most serious opposition to the Bill. They proved that the Hinksford and Ashwood wells had drained a large part of their district, that they had paid to get Bilston water to the village of Swindon, for which water rates were being paid in lieu of a free supply from pumps. An objection was laid to the confirmation of Hinksford and Ashwood Pumping Stations and they wanted a limit to be placed on each, reducing their present yield. The Parliamentary Committee were much impressed by the situation of these wells on the very edge of the Company's district and strongly hinted that a compromise should be reached. It was settled on the following terms; The Company to take over the Bilston payment of £45 a year and pay Bilston water rates for such property owners as could establish their case in Swindon.

The Company agreed to lay mains on a five per cent guarantee for ten years in those parts of the Seisdon district which were outside their limits of supply but within two and a half miles of Hinksford or Ashwood, and to supply water at seventy per cent of the water rates prevailing in Dudley. No increase was allowed to the yield of the two wells beyond one and a half and three million gallons per day respectively.

Lady Catherine Sarah Grey's objection on behalf of Enville Estates impressed the Committee. It was stated that thirty to forty wells on the Enville Estate had been deepened at a cost of £700 and that the damage to the yield was continuing. Limitation of pumping at Hinksford and Ashwood was pressed for, and in this Lady Grey joined hands with Seisdon Rural District Council. Ultimately it was agreed that the Company would lay mains to certain parts of the estate, estimated to cost £2,200, leaving Lady Grey to extend these mains to any points on the estate. Lady Grey agreed to waive all claim for past damage, to have 25,000 gallons a day free, but to pay ordinary charges for anything over this.

Bass, Ratcliffe & Gretton's petition was withdrawn on the Company repeating the restriction against sinking boreholes within seven miles of Burton on Trent.

Opposition from Staffordshire and Worcestershire Canal Company, incorporated by an Act passed during the reign of George the Third, put a serious obligation on the Company if the evidence of the Canal Company's witnesses was corroborated. They proved from tests made on two occasions, upwards of 600,000 gallons of water a day leaked from the canal near Hinksford and Ashwood, and they asked for the "Wolverhampton Clause" which put upon the water authority the cost of any repairs if "any leakage" takes place. It was said that possibly eight miles of canal may require puddling. The Committee allowed the clause but adjourned the hearing for two days for the exact wording to be agreed. At the re-hearing the Committee accepted a modification that the Chairman of the Company C.G.Beale had settled with two Directors, Gilbert Claughton and Edward Key, to the effect that the obligation to repair, i.e. puddle, only arose if the Company failed to show that the leakage was due to other causes and if the Company were unable or unwilling to make the damage good by supplying water under the compensation clause. The canal counsel protested, but the Committee thought they were over reacting.

The Marquis of Anglesey objected to the Maple Brook site on the grounds that it would drain Beaudesert. It appeared that the Marquis was about to install a water system for pumping from springs to a tank 730 feet above ordnance datum, which would command Beaudesert and Chestall. In the event of Maple Brook draining these springs, a large expenditure would have been thrown away and the compensation both in money and works would have been extremely serious. After prolonged negotiations on the lines of the Company supplying water to the tank, thereby saving the Marquis's outlay, the Chairman asked what was being done about Maple Brook and Lord Anglesey.

With the case close to completion, it was obvious that the fate of Maple Brook depended on a settlement, C.G. Beale reluctantly closed on the following terms;

The Company to lay a main at an estimated cost £1,500, and to deliver 20,000 gallons a day free into the aforementioned tank provided by the Marquis, everything over the free supply to be paid for. All of the other petitions were settled amicably, Lord Dudley's petition was withdrawn on conditions which included an agreement by the Company to supply Turner's Hill, Dudley.

A landmark at Dudley's highest point and development at Cawney Hill.

Problems in supplying consumers in the highest part of Dudley bordering on to Rowley, namely Oakham, was overcome by the construction of Turners Hill Tower.

The tower was constructed on land purchased from the Earl of Dudley Estates, the conveyance being dated 30th June 1910. Construction work was carried out by F. Mitchell and Son of Manchester at a cost of £461. 4s. 2d. The floor of the tank is forty feet above ground level and has an internal diameter of twenty one feet six inches. Total capacity of the tank is 20,000 gallons, the depth of water when full being nine feet.

In association with the tower a small pumping station was built at Cawney Hill in 1910. Economically constructed of concrete blocks, four inches thick, reinforced on the four corners of the building and at the wall plate with angle irons. The roof was finished with asbestos cement slates on stained and varnished under boarding. The station measured nineteen feet by thirteen feet and was nine feet six inches high. The pumps drew their water from the Cawney Hill Tank and supplied the tower through six inch and four inch cast iron pipes. Each pump was capable of delivering 76,800 gallons per twenty four hours, and normally ran four hours a day. The plant consisted of two Tangye gas engines, each of six and a half brake horse power and running at 230 revolutions per minute. These engines drove triple ram pumps through gearing and the pumps ran at 42 revolutions per minute. The rams were four inch diameter by six feet stroke. Cost of the pumping plant which was brought into commission in April 1911, was £430. 1s. 1d.

Cawney Hill Pumping Station was replaced on a different site, in Hill Top Road, Dudley, in 1938. Water is supplied to Turners Hill by two Sultz horizontal pumps each 200 g.p.m. drawing its supply from Cawney Hill Reservoir. In 1970 the old gas engine house was demolished and a new pumping station housing electrically driven plant was constructed on the same site, this was put into service in July 1971.

Water supplied to Romsley near Halesowen.

Another outlying district was Romsley near Halesowen, which received a supply of mains water as from 1911. At that time there were forty five houses and a school supplied from wells, and it was envisaged that a mains extension would encourage building in the area. A small pumping station was built at Bromsgrove Road, Hunnington. Two Tangye oil engines and pumps were installed which lifted the water to a small concrete tank sited at Romsley Hill. Monoshaft Ltd supplied and fixed this receptacle. Hunnington Repumping Station was electrified in 1931 when two horizontal Mather & Platt and one horizontal Sultzzer booster pumps were installed.

A uniform scale of charges established.

Water rates in the Company's area of supply, which were comprised within the limits of the Burton Waterworks Act 1861, were reduced to the South Staffordshire Scale in 1912, thus bringing into line the entire area of supply under one uniform scale. An effort to achieve this started several years previously.

South Staffordshire Waterworks Company versus Barrow was a court case which helped to achieve the change, an extension of the Dobbs versus Grand Junction Waterworks issue of 1884. At the Burton County Court in February 1896, Judge Smyly Q.C. gave judgement in the action of the South Staffordshire Waterworks Company versus H. Barrow which was brought to recover moneys, alleged to be due in respect to a water rate. Henry Barrow the defendant, was a solicitors managing clerk of Ashby Road, Winhill, Burton on Trent. In 1895 he was summoned by the Company for arrears of water rate made up of:-

One quarters water rate payable in advance at Midsummer Day 1895;	6s. 3d.
Use of bath;	1s. 6d.
One quarters water rate payable in advance at Ladyday 1895;	6s. 3d.
Use of bath;	1s. 6d
Total	15s 6d

On the 19th of November 1895, Barrow paid into court 13s 6d. in respect of the claim being calculated on the net rateable value of his property which was twenty pounds. The Company's claim was based on the annual rack rent i.e. the gross estimated rental of the premises, which was twenty five pounds. At dispute was the two shillings balance difference between the two property values, a principle which, upheld in favour of Mr. Barrow, would have had a serious effect on the Company's income.

The defence was, first that the court had no jurisdiction until the water company had had the value of the house fixed, and secondly, that the rate ought to be assessed upon the net annual value, and not on the gross or rack rent of the house.

Upon the preliminary objection to the jurisdiction of the Court, his honour held that the defendant's contention must succeed, and also found for the defendant on the main question, granting the Company leave to appeal.

After some delay of arriving at a property reassessment agreeable to both parties, the case came up for judgement in the Queen's Bench Division of the High Court before Mr. Justice Lawrance in April 1897. Sir Robert Reid, Q.C. M.P. appeared for the plaintiff together with Mr. A.T. Lawrence; while the defendant was represented by Mr. H.E. Duke. Mr. Justice Lawrance in giving judgement, said in his action both sides agreed upon the facts, so that no witnesses had to be called. Action had been taken by the Company to recover rates, and the whole question between the parties was as to what scale the rates were to be charged upon. Winshill was, prior to the Burton upon Trent Improvement Act of 1878, a township in the County of Derby whilst Burton was in Staffordshire, the river forming the boundary between the two counties. After 1878 a portion of Winshill became one of the five wards into which the extended town of Burton was divided, Ashby Road was in that portion.

The South Staffordshire Waterworks Act of 1853 authorised the charge on the rateable value, the Burton Act of 1861 on rack rental or gross value, subsequently in 1866, when the two Company's amalgamated, the Act governing them enabled the South Staffs. Company to charge two different ways. Power to enlarge the limits of the district was also given in the Act of 1866 and said it should be lawful within these limits to exercise powers as if the places had been originally within the limits of the Act and gave the Company power to charge as if under the Act of 1861.

On behalf of Mr. Barrow, it was contended that the ambiguity in the Acts should be construed in the manner most favourable to the consumer. Mr. Justice Lawrance stated that he had put the two Acts together and reading them in the best way he could, he asked himself the question, did they give the Company the power to charge on the higher scale. He came to the conclusion that they did not, therefore his judgement must be for the defendant Mr. Barrow with costs.

Eventually the Company appealed against the decision, a judgement, adverse to the Company was given by the Master of the Rolls. He stated that after listening to both sides of the argument he had, "no more idea which of the two tolls ought to be imposed in the district than of anything else in the world", it brought his mind to this, that he should say the only way to decide was to throw dice or to throw up a penny and see which side it came down.

His decision was only applicable to Winshill. An appeal to the House of Lords by the Company was decided against.

Original mains to Dudley abandoned.

A part of the original twenty two inch main, on the London, Midland and Scottish Railway, from Wood Green to Dudley was cut off and capped at Wood Green Engine House on November 12th 1911, this portion of the original main had been in use up until 1908. It had been possible to pump from Lichfield direct to Wednesbury Reservoir, this was achieved by closing the twenty two inch valve on the main leading to Walsall Reservoir and regulating a valve on the twelve inch bye pass near the Subway, Bridgeman Street, Walsall and so increasing the pressure from Lichfield to Wednesbury head. The fifteen inch main from Tipton to Dudley was also abandoned. On 26th February 1931 the twelve inch connection off the twenty two inch main Holyhead Road, Wednesbury was disconnected. Two days later the eighteen inch connection off the twenty two inch main at High Street, Wednesbury, was disconnected by the same plumber, C. Boden. There were therefore no connections to the main between Wood Green and Wednesbury.

Death of the Chairman and the election of F.H. Lloyd.

The death of C.G. Beale occurred in 1912. He had been a Director of the Company for sixteen years and Chairman since 1908. Charles Gabriel Beale was an Edgbastonian, being a well known Liberal nonconformist from a prosperous Birmingham family. His grandfather, Samuel Beale, was a leading merchant in the 1830's dealing in lead and glass which in the early days of casement windows invariably went together. One of his sons, William John Beale, the father of C.G. Beale, was a member of Colmore and Beale, solicitors practising in Waterloo Street, Birmingham. Their extensive legal business acted for the Midland Railway Company and the Colmore Estate.

C,G, Beale was born May 10th 1843 at Courtlands, Harborne Road, Birmingham, at that period a mere country lane. As was usual, amongst the leading city families, he was sent to a well known preparatory school owned by a Miss Ryland and afterwards sent to a proprietary school at Five Ways, Birmingham. After leaving school he was placed at Trinity College, Cambridge where he took a B.A. degree in 1865, followed by a M.A. degree.

On returning to Birmingham he was articled to his father and admitted to the Law Society in 1868. The title of the firm became Colmore and Beale, followed by Beale and Marigold and later was known as Beale and Company. Beale's life fell into three main divisions, first and foremost was his business interests and partnerships in the family solicitorship, secondly his civic life and lastly his connections with such institutions as Birmingham University, taking an active part in converting Mason College into the University.

He entered the Birmingham Town Council in 1885, where he was a dominant personality, wielding considerable influence.

During his years as a Councillor, he was elected Chairman of the Water Committee carrying the scheme for supplying the city with water from the Elan Valley. Another post held was the first Chairman of the Tramways Committee. During the years 1898, 1899 and 1900 he was Lord Mayor, described as a brilliant term of office, and amongst the notable events taking place was the purchase of the electric supply undertaking. Beale married the daughter of Mr Timothy Kendrick of Egbaston whose second wife was a sister of Joseph Chamberlain. There were four children by the marriage two sons and two daughters. The Beales as a family, seldom pushed themselves to the forefront in political matters and shunned publicity, living at Maple Bank, Church Road, Egbaston and an estate called Bryntirion, near Barmouth, Merionethshire, Wales. At various times he held office as a Director of the London City and Midland Bank and Vice Chancellor of Birmingham University. In 1907 he was High Sheriff for Merionethshire, in recognition of his civil interests, C.G. Beale received the Freedom of the City of Birmingham in July 1912.

"The professional and public life of Birmingham is thereby perceptibly poorer." were the headlines proclaiming his death on 18th September 1912. "No one except Joseph Chamberlain has so worthily and disinterestedly devoted his life to the city's welfare". His experience as a negotiator on behalf of large undertakings and his knowledge of private Bill practice were of great service to the Council and South Staffordshire Waterworks Company. He died at his home aged 69 years after suffering on internal complaint for several months. Hundreds attended his funeral service on 5th September 1912, Charles Gabriel Beale was cremated at Perry Barr and his ashes were interred in the Unitarian Cemetery, Alcester Road, Birmingham. He left an estate valued at £135,637.

Francis Henry LLOYD who had been a Director since 1895 was appointed Chairman of the Company in 1913.

The 1913 Act of Parliament, strongly opposed by Sutton Coldfield.

Following the 120th half yearly meeting of the Company on March 1st 1913 an extraordinary meeting was held for authorisation to proceed with a Parliamentary Bill to obtain powers to enable them to construct new works, raise additional capital, alter period of meetings and to transfer a district to a different authority.

Two of the works proposed came within the Borough of Sutton Coldfield. First of these was for the sinking of a deep well with adits and the erection of a pumping station in the north of the borough close to the Bogs, on the Little Hay side of Canwell, to the east of Alder Farm and to the north of Camp Road. Here twenty one fields or enclosures had been scheduled, half in Sutton and half in Weeford Parish, over which, if the Bill passed, would have extensively increased the Company's powers. News of the proposals resulted in meetings being held by the Borough Council and the Trustees of the Sutton Coldfield Municipal Charities, when members expressed concern on the merits of the scheme. There was widespread opposition.

It was believed that it would mean the tapping of the springs of the greater part of the borough, so depleting most of the one hundred and fifty wells in existence in Sutton, and also the park, to such an extent that the supply of water to its pools and lakes would cease, while in the course of a few years tree life would be manifestly affected, creating a barren wasteland. It was feared that the development of works in the Canwell area would damage the Trustees property at Hill Hook where it was expected the supply to two pools might be depleted and the water mill rendered useless.

In the second case, the works were of a similar character in the centre of Sutton Coldfield on the Homewood and New Hall Estates between Walmley Road and the Midland Railway. The site here was intersected by the Plants Brook, which rose in the heart of Sutton Park on the Banners Gate side, and partly fed Longmoor Pool, Powells or Spade Mill Pool and Windley Pool, the remainder of the supply coming from internal springs. Water flowed from Windley Pool across the lower part of the park to Penns and Walmley and across the sewage farm into the Tame. Birmingham Corporation had rights to take two million gallons of water from Plants Brook for supply purposes, but had not exercised their rights for some years in consequence of the Welsh Water Scheme. But the importance of having a back up reserve supply to the local reservoirs in time of breakdowns or stress periods was considered necessary. Under the arrangements in existence at that time, any surplus water above two million gallons was used by the Drainage Board, to dilute the effluent from the sewage farm and bacteria beds prior to it flowing into the Tame.

Sutton's petition against the 1913 Bill was that the future of its Park was threatened and the value of the Charitees Trustees property stood to lose considerably. It was considered that Sutton Coldfield was not a fit and proper place for pumping stations to be erected by a monopoly company having control over such an extensive area.

A notice in the Sutton Coldfield News read;

Warning.

Owners of property within and in the district of Sutton Coldfield, who have wells or other sources of water supply, are warned that the South Staffordshire Waterworks Company is seeking Parliamentary Powers which may seriously affect them. Steps to safeguard their interests should be taken at once and any person desiring any information should apply to the Town Clerk, R.A. Reay-Nadin, at his office Council Office, Sutton Coldfield.

There were nineteen petitions against the Bill, mostly by private individuals including The Hon. Mrs. Louisa Harriet Henry and others, who were owners of Wyndley and Powells Pools.

At a meeting of the Borough Council in April 1913, the Water Committee was informed that a letter had been received from the Company's Solicitors stating that they had decided not to proceed with the works and in the circumstances the petition was withdrawn. The Corporation were resting content for the time being with having saved the natural water supply of the borough by frustrating the proposal to build two pumping stations.

F.H. Lloyd the Company Chairman stated that the Directors did not find it practicable in the time at their disposal, to investigate thoroughly the justification for the opposition, or to deal with the opponents, and they accordingly decided to abandon these proposals for the present session in Parliament.

Sutton Coldfield in 1913 covered an area of 12,828 acres and had a population of 20,132. Water rates receivable by the Company for the 5,153 houses in the borough was £7,000 per annum, the 73,307 yards of main laid had cost £21,392.

With regard to the proposals to hold only one meeting per annum, section 19 of the Bill, experience had shown that little interest was taken in the August meeting by the shareholders. It was holiday time and nothing beyond routine business could be done and as the Directors were elected at the February meeting it would seem sensible to hold just the one meeting each year.

The other proposal in the Bill was to transfer the district of Quinton to the City of Birmingham for water supply purposes. Quinton was a parish of about 838 acres situate on the boundary of the Company's area of supply and containing two hundred and fifty houses, of which one hundred and eighty four were supplied by the Company. One hundred and fifty five of these houses were within the village of Quinton proper, which was at this time mainly an agricultural area. By a Local Government Board Order of 1909 the parish of Quinton was transferred from the County of Worcester into the City of Birmingham whose water undertaking took a supply from Wales, but it remained in the Company's area of supply. It was the only portion of the City, at that time, which was outside the Birmingham area of water supply, though they, as the Local Authority, could afford a supply in the district in case the Company were unable or unwilling to extend their mains.

Quinton and the neighbouring parish of Harborne in the City of Birmingham had at that time, been the subject of a Town Planning Scheme. The city were anxious to have complete control of the district in every respect and they had approached the Company with a view to its transfer. The total amount of water rates receivable from Quinton was £144 per annum.

Royal Assent to the an amended 1913 Bill was given on 4th of July 1913. Quinton was transferred on 29th of September at a fee of £2,100 for rights of supply and purchase of mains.

The only work authorised by the 1913 Bill was a service reservoir at Warley in the parish of Oldbury and the subsequent pipeline, which was required to replace the Company's reservoir at Rowley, which had been damaged by coal mining and rendered useless.

Langley Reservoir was completed in July 1914 and built by George Law and Sons Ltd. of Comber Hill, Kidderminster. The freehold land situated in Bristnall Fields containing one acre and twenty eight perches, known by the name of Chapel Brake was purchased from Ann Elizabeth Hollins and Florence Louisa Morris for £250 in 1911. Capacity of Langley Reservoir is one million gallons.

The First World War Years and the 1915 Act of Parliament.

A difficult interlude in the history of any public utility, and South Staffordshire Waterworks was no exception, was the period of the First World War in 1914-1918, restrictions being experienced on capital expenditure with shortages of materials and labour.

The number of houses to which supplies were laid during the year ending 1914 was 1,094 making a total supplied 144,361. The gross amount of water rates for the year was £158,882. A sum of £2,000 was transferred to the Depreciation Fund thus raising it to £51,621. The Capital Account by works generally, being the total of the accounts rendered for expenditure on land, buildings, reservoirs, machinery, mains and other expenses amounted to £1,627,066. Wages and salaries for the year were £9,002, Directors attendance fees £1,775 and the Company paid £5,860 Income Tax. Water pumped during the year amounted to 6,270,851,833 gallons, the cost of pumping, coal, oil and engine workers wages was £27,186, average cost of pumping a thousand gallons was 1.04d and the average price obtained for a thousand gallons was 4.87d.

Published in 1914 was the Return as to the Water Undertakings in England and Wales which was a comprehensive survey of the countries water supply. Statistics and particulars were given of 2,160 water undertakers made up of 786 Local Authorities, 35 Joint Water Boards, 200 Water Companies with Statutory Powers, 84 Private Companies and 1,055 Private Proprietors. Of the Companies the largest was the South Staffordshire Waterworks Company distributing sixteen million gallons a day.

A special meeting of the Company, called in accordance with standing orders, was held at Paradise Street, Birmingham, on 28th of January 1915 when F.H. Lloyd presided. Other Directors present were Sir Gilbert Claughton, Frank James, Edward C. Keay, Hubert K. Beale, G.J. Sparrow (Secretary), and A.G. Johnson (Solicitor). W.W. Wiggin, was absent on military service and Rowland Hill was indisposed.

After the Secretary had read the notice convening the meeting, the Company's Solicitor explained to those present the nature of the Bill about to be presented to Parliament. It proposed extending the Company's limits of supply to include the parishes of Brewood, Stretton, Lapley, Kinvaston, Penkridge, Teddersley Hay, Hatherton, Saredon, Shareshill, Featherstone, Hilton, Cheslyn Hay and Great Wyrley. By clause six it was intended to seek powers to construct two pumping stations in the parish of Brewood, namely Somerford and Slade Heath, and certain pipe lines to enable the water to be introduced into the Company's undertaking.

Following debate the terms of the Bill were approved. It was contemplated that the new works would come into commission late in 1915.

After the submission to Parliament of the 1915 Act of Parliament, once again there were numerous objections to a Bill. Wolverhampton Corporation opposed the Bill, alleging possible interference with their proposed well at Ivetsey Bank, four miles from Somerford and six miles from Slade Heath. The Staffordshire and Worcestershire Canal Company petition alleged that Slade Heath Pumping Station might interfere with their Canal, pointing out that under their Act they had power to take all the springs of water within 500 yards of the Canal, and that their canal not being puddled, these springs did actually feed it. Cannock Rural District Council alleged interference with private wells in their district. Royal Assent was given to the Bill but the Act carried with it, certain restrictions, whereby the Company was debarred from proceeding with the works until one year after the declaration of peace. The Act gave authority to raise capital of £200,000. Added to the area of supply were Kinvaston, Penkrige, Teddesley Hay, Hatherton, Saredon, Cheslyn Hay and Great Wyrley, the other parishes were added to the Wolverhampton Corporation's area of supply. With the war years intervening, the issue of capital was restricted and no building work was carried out.

Following the outbreak of the First World War in 1914, steps were taken to have the reservoirs and certain works watched night and day. Winshill Tower and Walsall Reservoir were watched by policemen for whom the Company were charged £1.16s.9d. per week. The Company's own staff guarded Scout House Reservoir, Barr Beacon Reservoir and the Stowe and Minster Pools at Lichfield. In the Tipton district, the seven reservoirs and tanks were watched by boy scouts with whom the company was in dispute, regarding the payment they should receive for their task. The scout's Superintendent pressed for payment of one shilling a day for each scout, plus tents, theirs having been destroyed by rough weather, and a conveyance to get from site to site. The Company replied by offering one pound per site per week. Adoption of the request would have added a thousand pounds to the Company's wage bill, so the scouts were paid off.

Watches continued until 1917 and were abandoned at the request of the police who expressed concern over the use of fire buckets by the personnel to keep warm.

During an air raid on 31st January 1915, Stowe and Minster Pools happened to be empty for repair and cleaning. Zeppelins passed over Lichfield and it was suggested by the local inhabitants that, as the pools were dry, the navigators in the aircraft were thrown off course and thereby the Cathedral was saved. A letter from the Dean of Lichfield asked for the pools to remain empty and the filling of the pools was delayed until April.

By order of the Army Council, under the Defence of the Realm Acts and Regulations, the Company was required by the War Office to provide an efficient water supply to the Military Camp established at Penkrige Bank, Cannock, including the design and carrying out of the work.

These works consisted of laying 4,115 yards of nine inch main and the erection of two 50,000 gallons and one 20,000 gallon water tanks the latter for the supply of a 600 bed hospital. All of the distributing mains within the camp were laid by the Military Authorities. The tanks, supplied by Messrs. Piggott of Atlas Works, Spring Hill, Birmingham, were made of sectional pressed steel, the larger size tanks measured 50 feet by 20 feet by 8 feet deep, made up of 137 sections, which were erected on 28 steel joists, 20 feet high at a cost £457 each.

The roof to cover the receptacles was curved and corrugated with manholes and ventilators etc. and supplied at a cost of £330 each. George Lowe of Kidderminster, completing work on a contract for Birmingham Waterworks, was immediately transferred to the site to carry out the mainlaying contract. There was hut accommodation at Penkrige Bank for 12,000 men with a further 4,000 at Hagley Park. At peak periods, 265,000 gallons of water was used each day, most of the water was supplied from Moors Gorse and Brindley Bank Pumping Stations.

There was a shortage of manpower at this time and the Company claimed exemption for its workforce from military service. Conditional exemption was granted for sixty seven men but not allowed in the case of ten clerks and seven workmen. Several women waste inspectors were employed and a uniform was provided, giving them what was described as a distinctive official indication of authority. Women were later employed as meter readers.

Change of Chairman and the fatal accident of F.H. Lloyd.

F.H. Lloyd resigned as Chairman of the Company on 25th of March 1915 but stayed on as a Director. This son of a former Chairman was succeeded by H.K. Beale, another son of a former Chairman. Hubert Kenrick Beale took office in 1915, commencing his long term of service.

Francis Henry Lloyd of Stowe Hall, Lichfield died on 5th January 1916 as the result of a railway accident at James Bridge Steel Works, near to Darlaston Railway Station. F.H. Lloyd filled so large a place in the public, religious and commercial life of South Staffordshire that his death in ordinary circumstances would have caused much regret but to have met his demise in the form of a New Year tragedy, aroused exceptional feelings of sadness and cast a gloom over the wide area in which he was a well known figure.

He had spent the day as usual at his works in James Bridge and was returning to Darlaston Station in the afternoon, along the private sidings, when he was knocked down by a light engine and sustained serious injuries. The grave character of them resulted in him being removed at once to the Queen Victoria Nursing Institute at Wolverhampton. There it was found that his skull had been fractured and an operation was performed. An operation afforded some relief and he recovered consciousness but a relapse set in and he died during the evening. For some days his death became the only topic of conversation in the district.

At the inquest, held at Wolverhampton Town Hall, it was said that Mr. Lloyd was in the habit of crossing the railway lines to get to Darlaston Station. William Reynolds the L.N.W.R. signaller, saw him leave the works and proceed towards the station. When three or four yards from an engine he seemed to hesitate and stepped immediately in front of the locomotive which was moving at walking pace. F.H. Lloyd was knocked to the ground and the engine passed over him as he lay between the lines. Driver of the engine, Henry Carnell, stated that after he sounded the whistle, Mr. Lloyd got clear of the lines but then stepped in front of the engine. The brakes were applied but it was then discovered that the deceased had been knocked down. He estimated his speed at the time to be four miles per hour.

The jury returned a verdict of accidental death, the foreman remarking that Mr. Lloyd seemed to have got confused. The driver was exonerated of all blame by the jury.

Son of Sampson Lloyd, former Chairman of the Company, F.H. Lloyd was a native of Wednesbury, a town his family had had connections with since the early eighteenth century. Born in 1844, his early life had been spent at Church Hill. Early schooling was received in Southampton continuing his education in Germany and Switzerland, then completing an engineering course at King's College, London. Education completed, he became associated with the works of Lloyd, Fosters and Company. A few years later he took control of the Bessemer Steel Works and this formed the principal part of his activities. Lloyd Fosters and Company was amongst the earliest companies to introduce the manufacture of Bessemer Steel. For many years he interested himself in the manufacture of weldless steel tubes an important industry which he originated in 1870. Although busily concerned in commerce, Chairman of Weldless Steel Tube Co., Birmingham and Member of the South Staffordshire Tramways Committee, he found time to involve himself in public work as a member of the Wednesbury Old School Board and in conjunction with Mrs. William Lloyd and the Rev. F.S. Edwards, Curate of St. James Church, a founder of the Wednesbury Society for the Relief of the Indigent Sick.

On the formation of Staffordshire County Council he was elected for the town's division. In 1890, Lloyd was placed on the Commission of the Peace for the County, acting for the Wednesbury Division as Chairman of the Bench.

During 1890 he moved to Lichfield to live in the historic mansion on Stowe Hill. A man of deep religious convictions in both Lichfield and Wednesbury, he took an active part in all Christian work, the Foreign Bible Society and the Church Missionary Society etc. During 1867 he had married Alice the daughter of J.E. Howard E.R.S. of Tottenham, London and raised a family of two sons and five daughters. Both sons enlisted in the Army during the First World War. Eldest son John was a Captain in the South Staffordshire Regiment, Major John Lloyd of the North Staffordshire Regiment was killed in action in June 1915.

Amongst the many mourners at the funeral of Francis Lloyd were over two hundred of his workmen. He was laid to rest by the side of his wife in the north east corner of St. Chads Churchyard,
Lichfield.

Resignation of the Engineer in Chief.

H. Ashton Hill had set his sights on becoming the first General Manager of the Company, a letter from the Secretary of the day H. Haselden, to Chairman Frank James, hinted at his disapproval of the idea. The resignation of Henry Ashton Hill was accepted by the Board of Directors on 28th June 1917 having asked to retire by reason of age, he was requested to remain in office until a replacement had been found. He received a retiring allowance of £500 per annum.

CHAPTER 4

1917 - 1944

New Engineer faces a water shortage.

John Fredric Dixon took up his appointment as Engineer in Chief in October 1917 and immediately faced a crisis, just as his predecessor had in 1895. The supply situation generally in the area gave cause for concern. With the advent of munitions work being carried out on a vast scale throughout the district, there was an enormous increase in consumption in trade supplies to these factories, this resulted in supplies to domestic properties being severely impaired. In much of the area, especially Halesowen, Langley, Oldbury, Coseley, Sedgley, Smethwick, Brierley Hill and Dudley, supplies were shut off each day from seven in the morning until seven o'clock at night. Without augmenting the available yield, the position was near to drought conditions.

Negotiations were opened for temporary supplies from collieries at Whitley, West Cannock and Four Oaks and two other sources, the Bratch Pumping Station of Bilston Waterworks, and Perry's Sinkings at Birmingham. None of these waters were utilised because of the high cost involved. Stourbridge Water Board came to the Company's assistance, and temporarily the situation was eased.

Due to circumstances arising out of the war, the Company was prevented from proceeding with new works under their Act of 1915, and this seriously interfered with the anticipated supply. During 1917 an application was made to the Ministry of Munitions and the Treasury for permission to commence a certain portion of the works sanctioned in 1915. Authority was obtained to sink boreholes at Slade Heath but no licence was obtained to construct the pumping plant.

Immediately the Armistice was signed, a reaction set in with regards to use of water. With no vast supplies required for munitions work, it was anticipated that domestic supplies would again become normal. Unfortunately this was only part realised, severe frosts followed in 1918/19 and the demand was again considerably increased, owing to a great wastage of water from burst mains and services. At this time, the Company, like other water undertakings, suffered considerably by the increased cost of commodities especially fuel, while the revenue from the water charges did not compensate for this abnormal increase, the dividend fell to one and a half per cent per annum. It was therefore imperative for the Company to apply to the Board of Trade for Orders under the Statutory Undertakings (Temporary Increase of Charges) Act to increase their charges.

A supply afforded from Baggeridge Colliery, Sedgley.

Other means of supplementing the water demand, without the expense of buildings and boreholes, were considered.

One such scheme was agreed with the Earl of Dudley's Baggeridge Colliery at Baggeridge Wood, Gospel End, Sedgley, when an analysis of the water, by John W. Colieswell, showed that organically the sample was very good and suitable for public supply. The colliery company had for a considerable time pumped water from the pit to waste which eventually gravitated to the ornamental pools at Himley Hall. The colliery in need of new plant for generating electric power and the waterworks requiring water to augment the supply to Sedgley Reservoir, it was to the mutual advantage of both parties to co-operate, whereby plant was provided in exchange for surplus water, to a maximum of 19,000 gallons per hour. South Staffordshire Waterworks removed one of the colliery company's existing pumps and replaced it with a turbine pump directly coupled to an open type motor in the underground heading of number three pit. This enabled water to be pumped in one lift, along a six inch main laid to Sedgley Reservoir. These works came into operation on 4th March 1919.

Six years later, in March 1925, the agreement was terminated, with the colliery company purchasing the whole of the pumping plant from South Staffordshire Waterworks Company.

There was further use of this source of supply in 1939, under the Courts (Emergency Powers) Act of 1939. The Company applied for and was granted, powers to erect a brick built pump house, a brick built suction tank and authority to install a duplicate set of booster pumps at the colliery site, for use in case of war damage to mains or reservoirs in Sedgley. The plant was provided by the Ministry of Health with an option given to the colliery company, to purchase at the end of the period of emergency. Operation of the plant was carried out by the colliery workmen at the water company's expense.

Facts and figures of 1919.

The total capital cost of works up to 31st December, 1919, was £1,669,988 17s 8d., which was equivalent to £2.27 per head of population supplied. At the same date the total estimated population, supplied with the Company's water was 733,955 persons, the number of houses supplied being 146,791, the number of metered supplies had reached 4,220.

The 1922 Act of Parliament.

At a Board Meeting in June 1921, Fredric J. Dixon submitted a report on the additional new works required for the purpose of obtaining further supplies of water. As far back as September 1911, Professor Lapworth reported at length on the water yield within the Company's area of supply and the possible sites for new wells. He pointed out that as each succeeding well had been developed in the past, the difficulty of finding additional sites had increased. Referring to this report, Dixon stated that the problem of new sites for supply purposes had considerably enlarged since 1911. In selecting the new sites he had been guided by information collated in the various geological reports of Professor Lapworth.

Recommendations were made to the Board to seek powers to erect pumping plant at each of the following four sites, selected as being the best available in the Company's area-

- 1 - The Boggs near Little Hay, Sutton Coldfield.
- 2 - The Birches or Rolling Mill near Rugeley.
- 3 - Prestwood near Kinver.
- 4 - Sandhills near Shire Oak, Walsall.

An informal meeting was held in July 1921 between the Company and Birmingham Corporation to discuss the supply position, with a view to obtaining water supplies from the Corporation, pending completion of additional works. Dixon's suggestion was to tap the Elan Aqueduct at Horsepool Tunnel, Romsley, filter the water and pump on to the district. Economically the viability of such a scheme depended on the cost of the water and the associated works. Dixon's figures were, Capital Expenditure £679,900, Annual Charges £82,802.

The Corporation replied by stating that the drawback to such a scheme was the aqueduct's capacity and until it was increased, no water could be provided. Their existing works were capable of supplying 67 million gallons per day, twenty seven million gallons of this was compensation water so unless the aqueduct capacity was extended, no surplus water was available. Another item discussed was the idea forming Midland Water Board.

In January 1922, at a meeting presided over by H.K. Beale, formal approval was given to promoting the 1922 Act of Parliament, seeking powers to construct new works, raise additional capital, and to increase the charges of the Company.

A special cheque for £26,692 was signed, payable to Messrs Sherwood and Company, Parliamentary Agents, being the amount of the Statutory deposit. The Chairman stated that although it seemed a large order to ask for four new stations, as two authorised under the 1915 Act had not yet been completed, it was imperative that these four sites should be earmarked for the use of the Company, to prevent these sites being built upon. The Bill further sought powers to increase the charges for water over and above the amount charged years ago. At that time they were charging under powers given by the Increase of Charges Act, a temporary measure, which was shortly to expire. When the news of the proposed Bill had circulated, local authorities hastily called special meetings to discuss the matter, special interest being centred on the increase in charges in respect of both domestic and trade supplies. Twenty four of the local authorities within the Company's area of supply were adamantly opposed to the increase of charges, deciding to petition against the Bill.

The Company's case opened before the Select Committee of the House of Commons on March 21st 1922. F.J. Dixon in giving evidence stated that he had prepared a diagram showing that water had to be pumped once, twice, three times and in one case four times prior to use. Owing to the coal measures the general reservoirs could not be linked up to supply generally all over the area.

There had been a steady increase in consumption of water for all purposes since 1902 and he anticipated that there would be an increased demand in the future for domestic purposes, pointing out that there were 30,000 privies to be converted into water closets, plus a more general use of baths, which meant increased consumption. His estimate was that a daily increase of 500,000 gallons for each of the next fourteen years was necessary to meet future requirements. Their existing works gave a total yield of 19.84 million gallons a day. From the two works authorised in 1915 he estimated they would get two and a half million gallons a day, and from the four new works proposed in the present Bill, they estimated they would get a total of five and a half million gallons a day.

He estimated the cost of constructing the works mentioned in the Bill at £667,294. The cost of constructing the works at Slade Heath and Somerford would be £189,856, much more than if the works had been constructed before the war. The total capital expenditure he estimated at £1,218,614.

Petitions against the Bill, apart from the charges portion, came from Rugeley District Council in connection with the Slitting Mill Pumping Station, on the grounds it would interfere with their well supply. Lichfield District Council also sought protection for private wells in their vicinity. In connection with the proposed pumping stations at Sandhills and Little Hay, the Staffordshire County Council, the Lichfield District Council and the Sutton Municipal Charities Trustees, petitioned to safeguard private wells. A clause was inserted in the Bill to ensure the protection of such supplies.

The protracted hearing of the 1922 Bill, which had spread over three weeks, drew to a close on April 4th, when the last of the evidence was heard in opposition to the proposal of the Company to increase their charges. The Committee after consulting in private, unanimously agreed that this portion of the preamble was proved subject to certain conditions which included sanctions with regard to dividends paid by the Company, and a cut of one per cent on the proposed increase in charges for unmetered supplies, houses with a rateable value of £10 and upwards. The charge of trade metered supplies was restricted to one shilling a thousand gallons, a drop of two pence from the proposal.

All of the opponents to the charges held special meetings, followed by a special conference of these parties and representatives of the Company. In view of the concessions which the Company agreed to make it was recommended that the authorities withdraw their opposition. The third reading of the Bill took place in the House of Lords on 24th of July and was passed. Other works authorised included reservoirs at Cawney Hill and Shavers End, Dudley and considerable mainlaying in association with the proposals.

The construction of Cawney Hill Reservoir, Dudley.

With the development of large housing sites in the Smethwich and Oldbury areas, the inadequate storage capacity provided by Cawney Hill Tank at Dudley was proving to be an embarrassment. The estimated daily consumption of this portion of the district was 559,000 gallons, storage capacity of the tank 100,000 gallons was only equivalent to five hours supply. In October 1921 the Engineer requested the Board's approval for an additional storage reservoir on the Cromwell Grove Estate, at the rear of the existing tank, on land purchased for £550.

The small site, surrounded by housing, was a disused quarry, one hundred and forty feet in diameter and of a most peculiar shape. Half of the reservoir had to be built on the excavated quarry some fifty feet deep. F.J. Dixon, not an expert in concrete constructions, advertised for tenders, making suggestions in the conditions, that if the specialists or contractors who were tendering had alternative designs which were superior to his own design, he was prepared to consider them. Forty five designs were submitted and considered of which three were short listed. Of these the patent scheme of Ritchie Ltd., incorporating reinforced concrete and steelwork, was selected.

Tenders for constructing the circular in plan reservoir, ranged from £5,000 to £40,000, and after consideration by the Board the tender of W.H. Davey of Runcorn was accepted.

The main features of Cawney Hill Number One Reservoir are, an internal diameter of one hundred and one feet, six inches, a depth of twenty feet and a capacity of one million and thirty one thousand gallons. Top water level is 823.3 A.O.D.

Wednesbury Reservoir and Shire Oak Reservoir covered over.

The construction of Wednesbury Reservoir was such that it was impossible to safeguard the purity of the stored water due to its close proximity to a densely populated area. A tentative scheme was prepared, by the Engineer, for an extension of the lining and the covering of the receptacle to protect the water from polluted air. A tender was obtained from W.H. Davey, who were just completing Cawney Hill Reservoir, with the intention of utilising as far as possible the timber shuttering from the site, the design of Wednesbury Reservoir being similar to the site just completed. The bulk of the timbering was used thereby reducing the cost. As this contract drew to a close the timber shuttering was transferred to Shire Oak Reservoir and used for the contract of covering and repairing this reservoir.

A blot on the landscape at Sedgley.

A careful survey was carried out in the Sedgley district after complaints of variation in the supply, due to low pressure.

The property housing the inhabitants was situated at a level only a few feet below top water level of Sedgley Beacon Reservoir. In an effort to improve the supply situation to the higher parts of the Sedgley District, it was decided to erect tanks at a high level.

The two steel tanks were army surplus and in use at Rugeley Camp on Cannock Chase and were purchased from the Disposable Board of the War Department together with a quantity of nine inch pipework. Tenders were received from Messrs Thomas Piggott & Company, the original suppliers of the receptacles, for dismantling the tanks and towers and re-erecting the same at Sedgley Beacon, provision being made to increase the height of the tanks by twenty feet. The cost of the work amounted to £1,145. Sedgley Water Tanks remained a Midland landmark for fifty years, they were dismantled and taken down in March 1974. Many had regarded the works as an eyesore which could be seen for miles around. An improvement scheme, altering the method of supply to the higher parts of Sedgley had brought about the redundancy of the tanks.

Completion of a station authorised by the 1915 Act of Parliament.

Somerford Pumping Station, situated seven miles from Wolverhampton, one mile north east of Brewood, was brought into commission in June 1923. The land, purchased from F. Moncton in 1920 for £649, covers an area of three acres. Construction of the borehole was carried out by Messrs. A.C. Potter and Company of Grantham three years previously.

A shaft, six feet square, was sunk to a depth of thirty two feet below ground level where it widened out to eight feet to receive the concrete foundations for the ribbed cast iron cylinders, thirty six inches diameter. These cylinders, which assist to carry the head box, the borehole pump and the rising main, were set truly plumb and concreted in position. The system of boring employed was the rotary chilled shot method, which enabled cores to be obtained. This clearly demonstrated the class of strata passed through, enabling a complete record of the geological formation to be made. Some excellent cores were obtained from the sandstones, the veining and faulting being distinctly shown. When the concrete foundations for the cylinders had set, boring was commenced with a thirty six inch shot tool. At ninety three feet, an artesian flow of water commenced and the diameter of the hole was reduced to thirty inches but increased later to thirty three inches to a depth of one hundred and ninety three feet. From one hundred and ninety four feet to three hundred and seventy one feet the boring was thirty inch diameter. This was then reduced to twenty inches and this diameter was maintained to eight hundred and eighty six feet below ground level, where a pumping test was carried out to prove the yield. The borehole eventually reached a depth of one thousand and fifty four feet.

During the progress of the boring operations, frequent plumbing tests were carried out to ascertain verticality of the boring work. F.J. Dixon specified that a deviation of one inch laterally per one hundred feet would be allowed. At two hundred and forty nine feet the deviation was one and a half inches.

As the boring had progressed, samples of water were constantly taken for the purpose of analysis. these showed a high chlorine content. Borehole work was completed in September 1920.

The introduction of the Somerford plant represented a new era in waterworks practice. The pumping plant consisted of a four cylinder Sultzzer Diesel Engine driving a vertical spindle centrifugal borehole pump and a horizontal spindle centrifugal force pump. The engines and pumps were of such size and power as to ensure easily, in continuous working, the delivery of 700/750 gallons of water per minute from any depth between 150/210 feet in the borehole below ground level, into Scout House Reservoir.

Building contractors for the station, including the cottages, were Thomas Lowe and Sons of Burton on Trent. Cost of the works, which partly provided for duplication of the plant, was £32,926. Each cottage cost £750, the main buildings and stores £11,200 and the pumping installation, including generating plant, £18,736.

Original pumping plant at Sandfields replaced and new filtration plant installed.

On 18th of June 1923 the purchasers of the original plant at Sandfields Pumping Station commenced to dismantle the three old rotative beam engines. On dismantling these works it was found necessary to dispense with the services of six men at the station.

Two Sultzzer horizontal uniflow steam engines had been installed to replace the James Watt engines, each driving a direct current 225 volt electric generator and a horizontal centrifugal force pump to deliver the water to Walsall Reservoir. At the same time the Company decided to construct a comprehensive filtration plant for dealing with water from this station, regarded as the last word of the rapid gravity type. To accomplish this object, it was necessary to lift the water to the surface for treatment and then pump the filtered water to Walsall.

The existing plant delivered the water in one lift to Walsall and the pumps could not be altered to meet the new conditions. Added to this, the plant was working at a low steam pressure and due to heavy continuous operation over a long period, was not in an efficient condition. Raw water was obtained from the impounding reservoirs, Stowe Pool and Hanch, supplemented by the "bleed" from the tunnel, through red sandstone between the reservoirs and Sandfield, then delivered to the wells, followed by pumping into the filtration plant. The process of filtration allowed for water to be delivered from the pumping station through a twenty four inch diameter main to the upcast shaft. A coagulant was added to the water in this main and mixed in the water as it rose in the upcast shaft, flowing along the mixing trough to the two reaction and precipitation tanks. These tanks had a water depth of 19 feet and a combined capacity of 420,000 gallons. Vertical baffles were provided in the tanks which precipitated the sludge, which then entered the two channels along the sides of the filter house and flowed on to the filter beds.

The ten filters each had a filtering area of 280 square feet the total capacity of the filters being four million gallons per day. The filtering medium consisted of a twenty seven inch bed of washed and graded Leighton Buzzard sand supported on eighteen inches of graded washed gravel. After filtering the water was collected in a trough and discharged at the administration end into the clear water tank which extended under all the filters, and at this point the chlorine was added. In the clear water tank there was a central division wall and baffle walls which made the water follow a winding path up one half of the tank and then down the other half to the suction well from which the force pumps drew their supply. A dechlorinating agent could be added at this point if required. The clear water tank had a capacity of 250,000 gallons.

Cleaning the filters was achieved by blowing air through the filtering medium which loosened the film of dirt resting on the sand. After shutting off the air, wash water from an overhead tank was passed through the filtering medium, washing the dirt into troughs which discharged into pipes leading to the sedimentation tanks. When the filter bed was clean, the wash water was shut off and after allowing a short interval for settling, the filter was again brought into commission.

After the wash water had settled in the sedimentation tanks, the supernatant water was drawn off through a floating arm and pumped back by a three inch centrifugal pump into the reaction tanks. Sludge which had collected in the bottom of the tanks was drawn off by two reciprocating pumps and delivered into sludge presses. Water was squeezed out of the press, leaving the sludge in the form of cakes which were broken up and spread on the land.

The filtration plant was provided the Paterson Engineering Company Ltd. Grays Ferro Concrete Company erected the building, J.R. Deacon being a sub-contractor for important portions of the work. The building was constructed of re-inforced concrete, the pilasters and cornices being finished in imitation Caen stone, and the panels in rough cast, regarded at the time as one of the finest buildings in its class.

On the second floor of the building two laboratories were established together with office accommodation for the Company's chemist and staff. The plant was operational from February 1927.

In 1966, the pumping plant was fully modernised with the construction of a new pump house building and the installation of new electrically powered pumping plant. The new pump house was constructed on the site of old uniflow engine house, using the old basement and wall footings, and was designed to blend into the Cornish beam engine house.

Cheslyn Hay Waterworks take-over.

Negotiations took place for a take over of a smaller water works in 1923.

The Company's Secretary reported that he had been in communication with the Clerk of the Cannock Rural District Council with reference to the completion of the purchase of the mains in Penkrige and Great Wyrley under agreements previously reached. An application was also received regarding the Company taking over the supply to Cheslyn Hay. The Engineer was instructed to make the necessary arrangements to take over the supply as from October 1924 and to reimburse a payment of £3,500 for the whole of the Cheslyn Hay Waterworks.

In 1897 the Clerk of Cheslyn Hay Parish Council reported that he had received a paper submitted by a Mr Berrington of Wolverhampton as to the best means of supplying Cheslyn Hay and Great Wyrley with water. His report also stated that the district could either arrange with the South Staffordshire Waterworks Company for a bulk supply or carry out a scheme of their own. In the event of a local scheme being adopted he estimated the provision of a well, engine, pump, pumping house, surface reservoir, mains and sites, would cost £3,000. The alternative scheme would entail the extension of the Company's Act of Parliament and they would have to lay complete mains, the approximate cost of which he estimated at £1,000. Should water then be supplied by bulk through a meter, it would cost sixpence a thousand gallons, giving a total cost per annum to the Council of £656 which included maintenance charges. Mr Berrington stated that there was no doubt that an independent scheme was the cheaper in every way for the district than to purchase water from the South Staffs. Company.

Two pieces of land, both half an acre in area, were purchased by the Cannock Rural District Council from John Thomas Hatton of Great Wyrley in November 1901, for £50 each site, exclusive of mineral rights, in order to construct the Cheslyn Hay Waterworks.

On acquisition by the Company of the Cheslyn Hay works, it was decided by the Engineer that the reservoir, pumping station and water supply were of no value. To have demolished the buildings was unremunerative, the value of the old materials just about balancing the cost of demolition work. In June 1936 the pump house site was let to a Mr. Humpage for use as an apiary at an annual rent of fifteen shillings, plus rates. At a later date the existing engine house was converted into a dwelling house, the pumping plant was disposed of, and the land on which the reservoir was constructed, was offered to the original vendor in accordance with a reverter clause in the deed of conveyance, which stated " In the event of these two pieces of land not being used for the purpose of the waterworks, it is agreed that the owners shall forthwith offer the land to the vendor, his heirs or assigns for repurchase."

Final work allowed for in the 1915 Act of Parliament, completed.

Slade Heath Pumping Station, Brewood was brought into commission in April 1924. Built by Messrs Thomas Lowe & Sons Ltd., to the design of Fredric Dixon, it was carried out in multi coloured facing bricks with terra cotta dressings. These works provided for four boreholes, two of which were completed and brought into service in 1924. The boreholes were sunk to a depth of over 600ft.

The pumping plant consisted of a vertical triple expansion rotative engine with pumps, designed to deliver two million gallons per twenty four hours. Manufactured by Messrs. Glenfield and Kennedy Ltd., the engine was named after a Director of the day, W.W. Wiggin. Boreholes 3 & 4 were sunk and commissioned in March 1932. The pumping plant was similar to the other engine but was manufactured by Messrs. Hathorn, Davey and Company Ltd., with the engine named after another Company Director, A.A. Worthington.

A tramway taken under the L.M.S. Railway main line, by subway, connected the boiler house with the canal wharf to which coal was delivered by barge and then weighed on an automatic weighbridge in the station yard. As at Somerford, the site was purchased from F. Monkton, in all, 2 acres, 4 roods, 28 perches at a cost of £544.

Facts and figures of 1925.

There were twenty seven engines pumping into supply in 1925 and the output of boreholes and wells was twenty two million gallons per day. The financial position of the Company had improved considerably and the effects of the war had to a great extent been rectified by the passing of the 1922 Act. Revenue from water amounted to £320,000; 158,000 houses were in charge, giving an estimated population of 790,000 a supply of water. There were also 4,200 metered services supplying 1,420 million gallons per annum. Total length of mains in the area of supply was 989 miles with 211 miles of pumping main and 778 miles of supply main.

Works authorised by the 1922 Act of Parliament completed.

Also empowered under the 1922 Act was authority to proceed with works at Slitting Mill, Sandhills, Little Hay, Prestwood and powers were also granted for constructing reservoirs at Shavers End, Coseley and Cawney Hill. These works were completed during the period 1925 to 1935.

Slitting Mill Pumping Station, near Rugeley, a wholly electrically operated station, was constructed in 1932 on land purchased from the Marquis of Anglesey at a cost of £3.057. Selection of the site was made after careful consideration, as there were several other promising sources of supply in the neighbourhood. Factors in the choice were the large quantities of water encountered when sinking a shaft at the Four Oak Colliery, abandoned on that account, about a mile south west of the station.

The name of the station, Slitting Mill, has associations with a vanished phase of local history. The situation of the building at that time was a pleasant part of Cannock Chase, but five hundred years ago the valley between Hednesford and Rugeley, at the foot of which it stands, was a busy centre for the smelting, rolling and slitting of iron. A stream, the Rising Brook, flowing down it, supplied power for blowing the bellows of the ironstone smelting furnaces along its sides.

The same waters, near Rugeley, drove rolling and slitting mills, the material from which was sent into the town to be worked up into various forms, including knives and weapons. In Rugeley, there were a dozen cutlers amongst its craftsmen. The names Furnace Pool and Slitting Mill thus preserve the memory of an old characteristic of the locality. The remains of the mill itself existed until it was necessary to remove them to make room for the new pumping station. A chimney stack in the centre of the building was a relic of the coming of steam power, probably being erected towards the end of the eighteenth century. Coins of this century and of the preceding one were found in the walls when the buildings were demolished.

Water was obtained from two deep boreholes sunk in the Bunter Sandstone of the Triassic formation. The pumping units each consisted of an electric motor operating a multiple impeller centrifugal borehole pump, fixed 200 feet below the engine house floor for raising the water, and a similar pump at the top of the borehole for forcing it to the district service reservoir, both pumps and the motor being on the same shaft. Each unit could be operated independently of the other and both could be used simultaneously if circumstances required it. Protection of existing wells, springs and other sources of supply within a radius of two miles of the station was observed, as also the restriction that the boreholes were to be lined to a depth of fifty feet below ground level.

Powers were obtained to drive adits, but the pumping test for yield from the borehole proved so satisfactory that this was not done. The boreholes were made of a sufficiently large diameter to enable adits to be driven at a later date should the necessity arise.

Both boreholes were exactly similar in design and construction, spaced at 36 feet centres. In the finished work, unperforated lining tubes were installed, 44 inches internal diameter, down to 50 feet. From this level to 300 feet they were 43 inches in diameter unlined, then down to 400 feet they were 24 inches in diameter unlined. Work was carried out simultaneously on the two boreholes. Borehole No. 1 was commenced on June 2nd 1930 and completed on June 19th 1931. The corresponding dates for borehole No. 2, were May 16th 1930 and July 17th 1931.

Messrs William Mathews and Company Ltd. Widnes, were the contractors. The method of construction was as follows; A timbered shaft 8 feet square in cross section was sunk to a depth of 10 feet and a steel guide tube, 4 feet in internal diameter by 28 feet long, was set up in its centre. This tube was lowered by internal excavation until its lower end reached the 32 feet level. During this operation continuous pumping was necessary. After the guide tube had been accurately set, a pilot boring, 2 feet in diameter, was carried down by the percussion method to 50 feet, then trimmed by an enlarging chisel to 47 inches in diameter. At this stage the boring was checked for verticality, and when satisfactory, the 44 inch lining tubes, above referred to, were lowered in. Below the 50 feet depth borehole No. 1 was sunk to 297 feet by the percussion method, a 2 feet pilot tube being put down first and later enlarged or trimmed to 43 inches in diameter. In the case of borehole No. 2 the rotary method with chilled shot was used from 50 feet to 100 feet and good cores were recovered.

At the latter depth loose conglomerates slowed down the boring considerably, so the rotary method was replaced by the percussion method from 100 feet to 298 feet. Below 297 feet in borehole No. 1, and 298 feet in borehole No. 2, the boring was reduced to 2 feet in diameter. In both holes the rotary method was used to 401 feet in No. 1, and to 398 feet in No. 2.

The percussion method of boring involved the use of a chisel shaped tool, connected to iron rods which was made to fall freely and frequently on to the bottom of the hole, a circular motion being given by the operators at the surface twisting the tool through a portion of a revolution at each stroke. When a sufficient amount of material had been cut away, a tool called a shell, jumper, or sludger, was lowered into the hole and worked up and down vertically in a similar manner to boring. The shell consisted of a hollow circular open top tube, having a steel knife edge around the bottom, and fitted inside just above the cutting edge, with a leather clack valve, and seating, so that, as the tool was dropped, the knife edge penetrated into the loosened material, which forced open the valve and entered the tube. When the tube was lifted the weight of the material which had collected inside caused the valve to close and retain it, further matter being picked up by the tube each time it was dropped until all the loosened earth was removed, when the cutting chisel was used again.

The rotary system for boring through hard rocks consisted of a circular cutter with a hard steel saw teeth, known as a calyx drill, which was used instead of a chisel. The tools consisted of hollow steel rods ending with a ring or crown on the bottom of which a cutting edge was formed. A toothed square bit, or crown with a removable steel ring, called a core ring, enabled the bored out core to be gripped, broken off, and raised to the surface. This crown was secured to a hollow core rod of equal diameter and of a suitable length for holding the cores, which in turn was connected to the boring rods and a rapid and continuous rotary motion was sent to them, which ground and cut the rock away and formed an annular hole separating the core from the surrounding material. A stream of water at high pressure was forced through the hollow boring rods to the bottom of the hole, and when a sufficient depth had been sunk, the core was broken off and drawn up to the surface to be examined. This operation was then repeated. During the construction of the boreholes, the flow was artesian at the rate of 500 gallons per hour.

The contractors for the whole of the buildings were Messrs. Thomas Lowe and Sons Ltd., Burton on Trent with Messrs. Executors of William Morris, Oldbury, as sub contractors for the brickwork and Messrs. Empire Stone Company Ltd., Birmingham for the artificial stone. Mather and Platt were the suppliers and main contractors for the plant, consisting of two sets of electrically driven, variable speed, direct coupled, vertical spindle, centrifugal borehole and force pumps of the multi stage type, working in series. Each set was capable of delivering one and a half million gallons of water per twenty four hours.

During 1924 the Engineer was instructed to proceed with the preparation of the necessary plans in connection with the development of Prestwood Pumping Station, including the pumping main to Shavers End and its service reservoir.

Prestwood Pumping Station.

The South Staffordshire Waterworks Company's involvement with Kinver Waterworks began in 1921, when the Company's application to Parliament for new powers contained two proposals to which Seisdon Rural District Council laid objections. Proposal number one was to allow an increase in the limit of water abstracted at Ashwood from three to four million gallons per day and two million gallons per day at Hinksford. Negotiations took place between Seisdon Rural District Council and South Staffordshire Waterworks Company, the outcome being that additional pumping was allowed at Ashwood on condition that no extra pumping would be made at Hinksford, this was agreed upon. Proposal number two was for powers to build a pumping station and sink a borehole at Prestwood. The objections were in relation to the ultimate effect on the water table in the vicinity and at Kinver.

Prestwood site lies on the west bank of the Smestow Brook, about half a mile above its confluence with the River Stour. The rich water bearing qualities of the routes in the Smestow valley are indicated by the numerous pumping stations sited above Prestwood. Trial borings were carried out to a depth of 626 feet to prove the geological formation. Penetrating only the lower red and mottled sandstone of the bunter formation in the trial, in sinking the shaft, surplus water soon necessitated pumping it at a rate of one and half million gallons per twenty four hours. The water table was found at only five feet below ground level, proving an important find.

A commencement was made on the first borehole in November 1923. Considerable difficulty was experienced in sinking the shaft which had to be close timbered on account of the soft nature of the strata. The chief problem however was caused by water which was encountered very near the surface.

Prestwood Pumping Station is situated amidst sylvan surroundings of river, canal and well wooded steep slopes. The layout of the site was determined naturally the pumping station being placed at the lower portion of a large hollow, four cottages for the Company's employees were laid out on higher ground. The buildings were designed externally in a free Classic style, with wide jointed multi coloured facing bricks two and a half inches thick, similar bricks of rustic finish being used below the plinth course. Internally the dadoes are of soft glazed brick with pressed buff facing bricks above. The roof was covered with blue Welsh slates while the floors were finished in terrazzo with Mosaic border and with coves at the walls. The engine house, sixty feet by thirty two feet, is a tall building, well lighted by large windows at sides and ends. The main pumping plant consisted of a borehole pump and a force pump in series for each of the two boreholes. Both pumps are of the centrifugal type and are driven by a common vertical shaft connected through a flexible coupling to a vertical spindle induction motor.

A.C. Potter of Grantham sank the boreholes at the site, Thomas Lowe and Sons erected the buildings and the pumping plant was supplied by Sultzter Brothers who were general contractors for all of the machinery.

By virtue of the 1922 Act of Parliament, the Company was empowered to proceed with the works at Prestwood, subject to certain conditions for the protection of wells and other sources of supplies within a prescribed radius of the station. Under Section 22 of the Act, Seisdon Rural District Council had the right to demand delivery in bulk of a supply to the Kinver Edge Reservoir after Prestwood Station was brought into commission, the Council to pay one penny per thousand gallons of water, for all time.

Prestwood Pumping Station was completed and commenced pumping into supply in 1927. Two boreholes were sunk, No. 1, 568 feet deep and No. 2, 531 feet deep. The water was pumped to Shavers End Reservoir, Dudley, seven and half miles distant.

Under the South Staffordshire Waterworks Act of 1922, Colonel H. Taylor, Clerk of Seisdon Rural District Council, duly requested the Company on 21st February 1929 to afford a bulk supply of water, under Section 22 of the Act, into the Kinver Reservoir for the benefit of the inhabitants. The Company, under the same Act, had powers to purchase the Kinver works, the Act stating that, in the event of a bulk supply being claimed by the Council, the South Staffordshire Waterworks Company, by giving the Seisdon Rural District Council three months notice, could purchase the Kinver Mill property, including the well, the pumping station with plant and the rising main to the Kinver Edge Reservoir.

Kinver's early water supply.

All the towns and urban areas surrounding Kinver established water works during the last century. None of these undertakings, given the opportunity, was prepared to extend their mains to supply Kinver because of the cost involved, with little chance of recovering the initial outlay. Provision of water supplies in rural areas has been a development of this century. Prior to this, Kinver, as other less favoured localities, depended chiefly on springs or wells for their source of supply. Approximately ten feet deep, the wells in the Kinver area were constructed of sandstone blocks, some brick lined in cement mortar, and puddled clay to prevent entrance of polluted surface water from the upper layers of soil. Several years previously a village pump, situated in Mill Lane, was in use as a communal supply. At the turn of this century, the Medical Officer of Health for the Seisdon district condemned samples of water taken from the wells of properties in the High Street. In consequence of this, a movement was set up by the villagers to canvass Seisdon Rural District Council to establish a water works scheme for the benefit of the inhabitants.

The question of a public water supply was raised and debated by the Kinver Parish Council in 1902. It was decided to approach Birmingham Corporation for a bulk supply of water from the Elan Valley Aqueduct which ran near to Iverley Farm. Advances were also made to Stourbridge Waterworks Company requesting the extension of their water main from the Ridge at Wollaston to the village. Unfavourable replies to both requests were received.

Mr. Taylor of Birmingham Corporation offered a bulk supply at their main pipes at a rate of sixpence per one thousand gallons. The cost of laying a main to Kinver ruled out this scheme. Mr. Barrett, on behalf of the Stourbridge Water Company, stated that his company did not have the necessary powers to supply the village lying outside their statutory area. Nothing happened to relieve the situation, apart from debate, until early 1905 when a comprehensive report was studied by the District's Parish Councils who decided to call into consultation a Mr. Berrington to examine and report on the possible sources of supply. Applications for tenders of the cheapest and most efficient scheme were requested in March 1905, fourteen replies were received.

The scheme adopted was one submitted by G. Chamberlain. Water was to be collected from a spring at Whittington and pumped to gravel pit at Comber, utilising river water power to drive the pumps. Difficulties in acquiring the spring led to the scheme being abandoned.

S.R. Lowcock, a civil engineer of Queen Anne's Gate, London, designed the eventual adopted scheme. Water was to be collected from a spring near to Kinver Mill and pumped to a reservoir to be constructed at Comber, approximately half a mile distant, where a gravel pit existed. Test boring had been made at the site, confirming a satisfactory yield was available, providing unlimited quantities of suitable water. The idea of G. Chamberlain with regard to motive power was embodied in the scheme and was one of the few instances in England where pumps were driven by water power obtained from the flow of a river and water supplied from a borehole near a river, yet the two having no connection. Problems were encountered in obtaining the land at Comber. Noel Kershaw, Assistant Secretary of the Local Government Board, wrote to the District Council to say that the gravel pit at Comber still contained material suitable for the repair of roads and highways and, due to an old Act of Parliament, The Enclosure Award of 1774, the acquisition of the land as a site for a reservoir could not be considered. After much debate and deliberation the ruling was reversed in October 1907.

Kinver Mill was acquired by Seisdon Rural District Council on December 19th 1907, at a cost of £1,000 from J.G. Lee who had inherited the premises from T.G. Lee. A mill on the site was probably one of four mills existing in the area, as recorded in the Domesday Book Survey begun in 1086. Whilst it is difficult to date the mill in use at that time, it is unlikely to have existed more than a century earlier, when less than a hundred mills were in use. The task of the mill has been a varied one, during the Civil War, swords were produced on the site, a corn mill was in existence in the mid eighteenth century and various articles have been made on site during the nineteenth century, including screws in 1846, iron and steel wire in 1868, spades and shovels in 1888 and garden tools in 1896. Owners and occupiers included, Abraham Stokes 1816, T.M. Woodyatt 1846, Daggs & Reeve 1868, C.J. and E. Forrest 1874, T.G. Lee 1875, Job and Joseph Mills 1868, Joel Siddaway 1888, Thomas Timmins 1896. After 1912 the works were acquired by M.S. Clews when a sawmill was established. In 1920 the premises were in the possession of Mr. J. Wrigley.

The contract to construct the Kinver Waterworks was awarded to George Holloway of Darlington Street, Wolverhampton in December 1907. On January 3rd 1908, his workers were on site. During the first week, a portion of the mill had been demolished and work was in hand to remove one of the old mill wheels. The other was renovated and arranged so as to be used as a standby to drive the pumps if required. The wheel, a breast wheel, to give its correct classification, was of the type, as the name implies, where water struck at the breast, level with its axle. Made at Coalbrookdale, a massive piece of machinery, its measurements were ten feet diameter, fifteen feet wide, the wheel rotated on a shaft weighing fourteen tons. At the beginning of March 1908, the new turbine and pump house had been constructed, together with flumes, channels bringing water to the wheel, and sluice gates, controlling the supply to the wheel. The pool and River Stour were cleaned and dredged and the weir and sluices put into working order. Under the centre of the pump house a well measuring eight feet in diameter, by sixteen feet six inches deep was sunk, and a borehole put down from the bottom of the well, 170 feet into red sandstone, allowing water to rise into the well from where the water was to be pumped. The borehole was lined with eleven and a half inch steel tubes. This part of the contract was carried out by Messrs. Brown and Company of Stourbridge. The plant consisted of two horizontal three throw ram pumps, made in Wolverhampton by Joseph Evans and Sons, driven through gearing by a water turbine, Messrs. Gilkes and Company of Kendal constructing the latter. All the machinery was in duplicate and so arranged that either or both sets of pumps could be driven by either the turbine or the water wheel, and each set of pumps was capable of lifting the whole day's supply of water to the reservoir in ten hours, allowing for sixteen gallons consumption per person per day for the population of 2,500.

On March 28th 1908 it was reported that the four inch main to the reservoir site from the pumping station had been laid and tested along its route across Mill Lane, through the gorge alongside the old Grammar School, along Church Hill and on to Comber Hill. The reservoir was suitably sited at the top of Church Hill, elevated 300 feet above the level of the mill site, at a sufficient height to give pressure over the tops of all the village properties. Constructed of concrete, the reservoir was lined with brickwork and covered with brick arches. Its capacity was 120,000 gallons, enough to last for three days, necessary in order to maintain supplies during repairs to mains or pumps.

The most time consuming part of the contract was laying the service mains, which were made of cast iron, in various sizes from two to six inches, lead jointed. In all, eight and a quarter miles of pipes were laid, extending from the reservoir through Kinver, Comber, Potters Cross, Gallowtree Elm and through Stourton to the Stourbridge boundary at the Ridge at Wollaston.

The scheme involved an expenditure of approximately £8,500 inclusive of the cost of the site and preliminary borings. The Local Government Board sanctioned a loan of £6,000 and as work progressed another application was made to the Board for permission to borrow a further £2,500, the extra cost was largely accounted for, by the extension of the mains to the Wollaston boundary.

It was expected that the cost of the scheme would entail a rate of five pence in the pound on the general rates, in the parish of Kinver, which was later estimated at seven and a half pence. The whole of the works was completed in October 1908. Messrs. G.F. Lynde and T.S. Chadwick acted as Resident Engineers while the works were carried out.

Tuesday, November 10th, 1908 was a memorable day in the annals of Kinver, when the opening ceremony took place, the event arousing a great amount of interest. A company of more than seventy, assembled at noon, at the pump house to witness S.G. Dudley J.P., vice-chairman of Kinver Parish Council, formally start the pumps and declare the new works open. A gold key used for the opening ceremony was ornamented with, Mr. Dudley's crest, coat of arms, name and an inscription commemorating the event. Among those present were the Rev. Winnington Ingram, Rev. T.A. Cooper-Slipper, C. H. Cole, J. Jenks, J. Lakin, J. Perry, Thomas Wellings, George Hemmings, Arthur Jenks, W. Walling, W.E. Anslow, G.F. James, H. Taylor, A.J. Bills, A. J. Bennet, H.K. Foster and Randle L. Mathews.

After ten minutes running time, the electrical level recorder at Comber Reservoir announced that a certain level had been reached by the water, the party then inspected the works and surroundings of the Mill before proceeding to view the reservoir. On reaching the village they witnessed a demonstration flow and pressure test, carried out by Lieut. T.L. Walker of the Stourbridge Fire Brigade, on hydrants in the High Street. Special adapters had to be affixed to the ball type hydrants to allow the use of the fire brigade's lug type standpipes. One hundred and twenty pounds pressure was recorded on the undertaking's main.

All the party then adjourned to the White Hart Hotel, where lunch was served. The Vicar of Kinver, Rev. T.H. Cooper-Slipper, proposed success to the Kinver Water Works. Completion of the scheme he regarded as a great achievement, especially in a place where there were no great industries to provide the capital to pay the bill which had not yet been presented. They, the inhabitants of Kinver, would pay for it without having the management of it. It was something he could not quite understand, when Kinver paid for something that belonged to Seisdon. There again, that might be his lack of intelligence, a remark which was greeted with great laughter. Mr. Dudley in reply stated that there now existed an inexhaustible supply of water available to everyone. The rate fixed had been seven and half per cent on the rateable value with a minimum charge of two shillings and sixpence, per quarter for water. It was well known that Kinver was the healthiest parish in the Seisdon Union, and with a good supply of water, they might now expect to live for ever.

One of the problems associated with the works, occurred when the River Stour was in flood or the level of the water was low. The pumps were then rendered inoperative. To combat this, a traction engine was placed near the blacksmith's shop and the pumps were driven by a counter shaft passing from the mill to the water works, so providing the power to maintain pumping. At a later date a Campbells oil engine, Nr. 3758, was purchased from the proprietors of "Bethany", the crippled children's home at the Hyde, Kinver. This engine, run on paraffin oil, was housed in a corrugated iron shed.

For the next twenty years, the system worked well, there was no engineer in charge of day to day operations, as in the majority of small undertakings, the duties of engineer were carried out by the Council's surveyors.

Kinver Waterworks acquired.

On 5th April 1929 the rights contained in the 1922 Act were exercised by the Company when they gave the requisite notice to purchase the Kinver Waterworks. Civil engineer, M.G. Weeks of London, was appointed by the Council to value the works and a figure of £7,603 was arrived at. The figure quoted by the Council to the Company was £8,000, the Company offered £7,000. After much haggling, the original valuation of £7,603 was agreed. Many of the Kinver Councillors criticised the sale, stating that the birthright of the village was being sold for a bit of potash.

The South Staffordshire Waterworks Company became the new owners on 30th October 1929. A clause inserted in the sale by Seisdon Rural District Council called upon the Company to dispose of the water wheel at the mill before June 1930. It was broken up and sold for scrap to Cashmores of Tipton. Water rates were paid by the villages to the Council, who paid the Company one penny per thousand gallons.

The Company commenced pumping water with the plant then existing, but unfortunately it proved incapable of providing an adequate supply to the village. When the supply was taken over, the average daily consumption was 74,000 gallons.

During August Bank Holiday weekends, the conditions of supply at Kinver caused great anxiety as the plant was insufficient to meet the demands due to the large crowds visiting the village, the pumps were running continuously and the water level in the reservoir diminished very rapidly. F.J. Dixon, decided to scrap the existing plant, and two electrically driven automatic control turbines were installed. Power to the station was supplied by the Shropshire, Worcestershire and Staffordshire Power Company.

In 1933, at a request of Seisdon Rural District Council, mains were extended by the Company up to and throughout Enville. The existing main near Highgate Common was extended along Gospel Ash Road to the Royal Oak Inn at Halfpenny Green and from there up to and throughout Bobbington. A new pump house was built at the rear of the Mill in 1934, to house a vertical electric pump purchased from Mather and Platt of Manchester. Structural steel work was supplied by Hill and Smith of Harts Hill, Dudley. Building work was carried out by the Company's own building section, final cost of the scheme was £3,383. 6s.8d.

New works at Kinver.

F.J. Dixon realised that a vast amount of water remained untapped at the station, and investigations were carried out for confirmation. Negotiations began in 1936 to purchase land, on the opposite side of the River Stour, owned by Alfred Marsh of Dunsley Hall. Formally used as the terminus of the Kinver Light Railway, the site lay on land separating the river from the canal. Having acquired the land, the Company decided to construct new works.

Work on the boreholes was carried out between October 1936 and November 1937, the contractors being C. Isler and Company of London. Number One borehole was sunk to a depth of 750 feet and three inches and was lined with 44 inch to 40 inch diameter solid lining tubes to a depth of 93 feet, and from this depth to 123 feet, the borehole was lined with 40 inch slotted lining tubes. No. 2 borehole was lined with 44 inch diameter solid lining tubes to a depth of 77 feet and from this depth to 123 feet it was lined with 40 inch slotted lining tubes. Both boreholes were 39 inch diameter unlined from 123 feet to 342 feet and below 342 feet are 23 inch diameter, unlined. Throughout the whole depth, the boring was carried out in the new red sandstone.

Thomas Lowe of Burton on Trent constructed the pumping station and cottage, which were designed in a modern style with a flat concrete roof and oversailing cornice. Owing to the nature of the ground, the station was built on a concrete raft carried on sixty five, cast in situ reinforced concrete piles, carried through the alluvial draft and resting on the underlying sandstone. The buildings were finished externally with red matte facing bricks supplied by Messrs. Morris of Oldbury. The pumping plant consisted of two electrically driven vertical spindle centrifugal pumping sets with borehole and booster pumps on the same spindle. Messrs. Sulzer Bros. of London Ltd. supplied the pumps and British Thompson Houston Company Ltd the motors. Water from the station was pumped through a twenty four inch steel main, laid alongside the old tramway to Shavers End Reservoir, Dudley. Sterilisation was carried out by the addition of chlorine which was injected down the borehole. Work was completed in 1939, resulting in the old pumping station being closed down. The cost of the work was £11,620.

During the late 1940's, when the Ministry of Housing and Local Government urged the water industry to rationalise by forming larger units, a large number of small undertakings were unable to finance the technical staff required to become fully efficient and amalgamation was considered necessary. In 1950 an inspector of the Ministry of Housing and Local Government visited the West Midlands area and carried out a review of the water undertakings. One of his recommendations was that the supply to the three Seisdon parishes, Kinver, Enville and Bobbington, should be divided between the Wolverhampton undertaking and the new Board of North West Worcestershire, formerly Stourbridge and District Water Board. Seisdon Rural District Council preferred to sell the rights of its water supply to the South Staffordshire Waterworks Company rather than have the three parishes divided, and sought a meeting with the Company to discuss the regrouping exercise.

Negotiations took place over a long period, mainly because of the Ministry's policy of not allowing the transfer of local authorities undertakings to companies and Wolverhampton's wish to supply Bobbington.

On 1st April 1968, the water supply afforded by Seisdon Rural District Council to the three parishes was taken over and continued by the South Staffordshire Waterworks Company. For the period of five years from the take-over date, water charges in the area were forty per cent less than the normal charges of the South Staffordshire area, from the 1st April 1973, less by twenty per cent, until 1978, when the full water rate charge became operative.

The nineteenth century mill was demolished in 1980, despite a fight by the Kinver Historical Society who wanted the building preserved as a village museum. When the original works were opened in 1908, two commemorative stones, recording the names of the council members and contractors involved in the scheme, were laid in the brickwork of the station entrance. One of these stones has been preserved in the grounds of the present station. With Kinver being supplied direct from the pumping station, the Comber Reservoir site became redundant in 1968. It was acquired by the Parish Council for use as a burial site. The structure has been converted into a Chapel of Rest by a group employed by the Manpower Services Commission.

Today, the majority of the Kinver district is supplied by water from Kinver Pumping Station's twenty four inch main, the exception being Stewponey, Hunter's Ride, Enville Road, Dark Lane and Lower Falcon which are supplied from Cookley Pumping Station.

New reservoir constructed at Dudley.

Shavers End No. 1 Reservoir was by 1920 supplying an extensive area, both industrial and domestic, including the towns of Dudley, Tipton, Olbury, Smethwick, Blackheath, Halesowen, Sedgley and Coseley. Owing to marked developments, particularly in housing and improved sanitary conditions after the First World War, it was found at times of heavy draw off, the storage at the reservoir was totally inadequate and a decision was made by the Board of Directors to build a second reservoir in the Shavers End area. The selected site for the project, later called Shavers End No 2, was after much deliberation and correspondence, four acres of ground, bordered by Limepit Lane and Burton Road and owned by the Earl of Dudley. The cost of the site was £3,300. An alternative site was land in Highland Road, Dudley but this was rejected as unsuitable.

Messrs, Harold Arnold and Son of Doncaster were the chosen contractors, working to the design and specification of F.J. Dixon. The contour of the site rendered the design somewhat difficult considering the top water level of the new reservoir had to be the same as the old No.1 reservoir. It was finally decided to adopt a composite mixture of steel and concrete for the structure which would be more than half out of the original ground on the east side and entirely out of the ground on a portion of the west side.

The contour of the ground and the site boundaries were also responsible for the structure's peculiar shape, the walls consisting of a series of buttress walls, curved in plan.

Work on the site commenced on 4th September 1925. After the site was cleared and the soil stripped, plant was moved on to the site. Excavation was carried out by a Thew steam shovel, the sub soil being a peculiar mixture of clay, shale, sandstone and thin seams of coal, in all 15,520 cubic yards. A small narrow gauge railway was in use on site for moving surplus soil and materials.

All of the concrete was mechanically mixed and distributed by an Insley concreting plant. This consisted of a steel main mast 200 feet high. In the centre of the site was a 100 foot mast built on a stout wooden trestle. This mast could rotate and carried from its base an 80 foot jib with a counter shoot at its end. The effective radius was 150 feet so the distributor nearly covered the whole of the site. Concrete from the mixer, emptied direct into the hopper which was elevated by a 40 horse power winch to the top of the main mast where it was discharged into another hopper. The flow of concrete was manually controlled by an unfortunate workman who spent the working day suspended 200 feet above ground level. Two hundred and fifty six mixings of concrete constituted a day's work and this was equal to 63 cubic yards in all. Over 5,508 cubic yards of concrete were mixed and poured, using 1,375 tons of cement. A major portion of the steel employed, took the form of a rigid pre-erected skeleton framework. It was a new system in which rolled steel sections, strengthened by round steel bars, were used as reinforcement. Five hundred and fifty two tons of steel were used.

The extreme interior length of the reservoir is 343 feet. For a distance of 68 feet from the outlet end, the side walls run parallel, giving a width of 231 feet. From this point the side walls converge, giving a width of 66 feet at the inlet end of the reservoir, its depth being 20 feet. The roof of the reservoir is divided longitudinally into 25 thirteen feet nine inch spans and transversely into 14 sixteen feet six inch spans.

The industrial troubles of 1926 seriously delayed the work for a period of eleven weeks. During the General Strike, great difficulty was experienced in obtaining steel, this part of the work being sub-contracted out to E.C. and J. Keay of Birmingham. Shavers End No. 2 Reservoir was built to accommodate water from Prestwood Pumping Station and a new twenty four inch water main was laid seven and half miles between the two venues. The new reservoir worked normally in conjunction with the old one but the mains were so arranged that either reservoir could be used by itself, or both cut out and water pumped direct to supply. The filling of the new construction commenced on 1st May 1928 and it was put into service after tests on 17th July. It has a capacity of seven million gallons at a top water level of 743.26 above sea level. The total cost of the reservoir was £41,068 6s 6d.

Twenty five years later the Company proposed building a third Shavers End Reservoir on land off Dibdale Street/Salop Street near to "The Struggling Man" public house. It was to have been of rectangular shape measuring 390 feet by 130 feet with an estimated capacity of 7.9 million gallons. The project was shelved and will never be implemented.

Replacement for Scout House Reservoir.

In 1928, the Company had to consider an alternative scheme for providing a new reservoir in a favourable site to replace Scout House Reservoir, Hednesford. Several schemes for the reparation of the doomed reservoir had been prepared, but owing to the excessive cost, ranging from £35,000 to £75,000, the Engineer considered the advisability of choosing an entirely new site.

A careful survey of the district near Chestall was made and a probable site selected at a favourable altitude. In order to avoid another white elephant, with coal mines affecting the works, a mining consultant was engaged to report on geological conditions. Negotiations were carried out with the Marquis of Anglesey's Agent for purchase of the ground at Gentleshaw near Cannock. An area of land, six acres, three roods, was secured for £2,000 which included the rights to mines and minerals lying under an area of seventy acres.

Thomas Lowe and Sons of Burton on Trent submitted the winning tender £37,191, to construct the five million gallon, reinforced concrete, covered reservoir on similar principles to Shavers End Reservoir. The site was situated 746 feet above sea level and acted as a balancing reservoir for the Cannock area pumping stations. Its dimensions were length 252 feet, breadth 216 feet, depth 15 feet and it was brought into commission in 1930.

New station near Sutton Coldfield.

Little Hay Pumping Station, near Manley Hall, brought into service in 1930, is situated half way between Sutton Coldfield and Lichfield, one mile from the main road and near the village of Little Hay. The station was designed in a free renaissance style with multi-brick facings and red hollington stone dressings. Running through the grounds of the station is Little Hay Brook.

The original pumping plant was constructed and supplied by W.H. Allen and Sons of Bedford. It consisted of two six cylinder diesel engines, each driving through a double helical speed increasing gear, a vertical spindle turbine type borehole pump and a vertical spindle turbine type booster pump, both mounted on the same vertical shaft. The two boreholes are 220 feet deep, their diameter varies from 44 inch to 24 inch, and were sunk by Messrs. Isler and Co. Ltd. Thomas Lowe and Sons constructed the pumping station and the two adjoining cottages.

The workings of Little Hay Pumping Station were subject to certain conditions, imposed by the 1922 Act of Parliament, for the protection of wells and other sources of supply of water within a two mile radius of the station. A further condition imposed was that the boreholes must be lined to a depth of fifty feet from the surface to keep out all surface waters. In 1949, No 2 pump was uncoupled from the oil engine and an electric motor installed by Laurence Scott Electromotors Ltd.

The borehole pumps were capable of lifting 55,000 gallons of water per hour from a depth of 150 feet below basement level, discharging into the settling tanks in front of the engine house where chlorine was added. Booster pumps deliver water from these tanks to Barr Beacon Reservoirs against a head of 425 feet through an eighteen inch steel main which connects into a twenty four inch main at Watford Gap.

The Reservoir (Safety Provisions) Act 1930.

Disasters at Dolgarrog in North Wales, and Skelmorlie in Scotland, demonstrated the dangers of reservoirs failing and danger to life. The Reservoirs (Safety Provisions) Act of 1930, made it incumbent on all water undertakings to have reservoirs examined and reported on. The Act imposed on undertakings in the interest of safety, precautions to be observed in the construction, alteration and use of reservoirs.

The first part of the Act prohibited the construction of a receptacle capable of containing a quantity of five million gallons of water above the natural surface of the ground, unless a qualified engineer was employed.

Panels of engineers were set up by the Secretary of State, acting in conjunction with the Ministry of Health to carry out periodic inspections of existing receptacles and to approve design and building of new reservoirs. It was, under the Act, incumbent on all water undertakings to report on and examine their reservoirs. F.J. Dixon was a selected engineer to one of the panels. Under the Act, the Company were requested to carry out some improvements which were necessary at Hanch Reservoir.

Lichfield's water supply, the oldest in the area.

A contract to provide a supply of water was set up between the Lichfield Conduits Trust and the Company and this came into force in 1930 to extend for a period of twenty one years. Water was supplied at a fixed rate of 4d. per 1,000 gallons. This charge was increased in 1951 to 12d, per 1,000 gallons after the expiry of the 1930 contract. The existing pumping station, wells and cottage owned by the Conduits Trust were taken over by the Company together with an engine house and plant in course of erection, on October 2nd 1930.

The Lichfield Conduits Trust dates back to 1546 when Hector Beane, the Master and Brethren of the Ancient Guild of the City gave their possessions and valuable properties with the prime object of conserving and maintaining the water supply to the citizens. Records show that Lichfield possessed a common conduit in the early thirteenth century. Documentary evidence refers to a Conduit Street and reference is also made to a conduit in High Street, in the Great White Register of the Cathedral, around the year 1280. The Close had its own private conduit prior to 1290 although the source of these supplies remains unknown. Pioneer water supply activities were usually financed and undertaken by the friaries and monasteries.

In 1301 Henry Campanarius, son of Michael De Lichfield, granted a supply of water from his springs at Aldershaw for the benefit of the Friars Minor. A heading of stone was built by the friars to collect the waters of the springs which were carried by leaden pipes to the Friary. Much of the water was used to satisfy their washing ritual, more prevalent amongst themselves than with the poorer classes. With the dissolution of the monasteries and friaries in 1539, the mediaeval works passed into ownership of the purchaser of the Friary estate.

During the reign of Edward VI, John Hill by deed, granted the springs at Aldershaw to the citizens of Lichfield. The years that followed saw the birth of greater urban organisation and with it the advent of a larger scale of water supply schemes. The ancient method of water supply distribution was well set out in a deed dated 1707 when the city cistern within the Crucifix conduit, to which the water was carried by lead pipes, was enlarged and raised by adding three yards of lead to provide a greater head of water at other lesser conduits situated at the Cross, Butchers Row and Stone Cross at the junction of Tamworth Street and Lombard Street.

Wooden water pipes, bored tree trunks, were in use in parts of the city, a statement on the condition of the conduit pipes in 1708 stated that these pipes " being made of alder had become rotten, leaky and in decay and accordingly taken up and replaced by leaden pipes". In 1801 the Trust replaced the original small gauge lead conduit from Aldershaw with a larger diameter cast iron main, thereby providing a much greater volume of water to the City.

By 1821, Aldershaw was proving to be inadequate source and a scheme was devised to supplement the spring's supply, by collecting the surface water from Tunstalls Pool, the Moggs and other pools and diverting water into the common conduits. When the situation worsened in the mid 1850's, the trustees acquired the Trunkfield Mill and Reservoir and a pumping engine was installed to increase the supply. In 1868 the supply of Aldershaw yielded 15,000 gallons a day. Trunkfield supplied 160,000 gallons a day, all of which was pumped to Crucifix Conduit. Water was provided to fifty seven public pumps, thirteen standpipes and public taps, thirty fire hydrants and three hundred and forty three houses.

The demand for a more copious supply continued to grow. In 1874, legal difficulties led to the abandonment of the Trunkfield site, and in its place a new water works plant was provided on the Walsall Road, with land at Beecroft providing a site for a new reservoir, costing £13,650.

The works were capable of supplying 300,000 gallons of water per day. Lichfield continued to receive water from the Conduits Trust up until 1930, although a direct connection between the mains of the Trust and the Company was made on November 7th 1923 at the junction of Short Butts Lane and London Road, to be used on certain occasions which included drought, fire, or breakdown at the Trust's pumping station.

In 1928, the Medical Officer of Health informed the Trustees that the water supply of Lichfield was polluted with sewage. An investigation followed and as a result of the Ministry of Health's enquiry, the Trustees were called upon to carry out certain works to remedy the situation at a cost of £18,000. The cause of the contamination was traced to Trunkfield Old Mill Pond. After the water left the pool it was subject to the most flagrant direct pollution from surface manure, the liquid manure tank or cesspit and a stoneware pipe draining from the farm. From this source the water ran near to, and past the Lichfield Pumping Station and fed the cooling pool which had been in use at the station. This source had also been utilised to supply the swimming baths situated near the pilot well at the pumping station.

Rather than spend money on new plant for a supply of 250,000 gallons per day, it was suggested that it would be cheaper to purchase a bulk supply from the Company. Members of the City Council opposed the proposal and it was not until a statement from the Trust's Warden and correspondence from the Ministry of Health were received, that they finally agreed to seek a supply from the Company.

Purchase of land for Seedy Mill works.

In October 1930 at the Swan Hotel Lichfield, the sale took place of the Lysways Estates situated between Lichfield and Rugeley. The properties had been brought on to the market in consequence of the death of Sir Francis Villiers Forster, the last baronet of a well known Staffordshire family. Lot 28, Seedy Mill Farm and the Mill House known as Seedy Mill were purchased by F.J. Dixon on behalf of the Company for £3,807. The properties covered an area of 137.914 acres.

Facts and figures of 1930.

By 1930 the Capital of the Company had risen to over two and a half million pounds. Revenue from water supplies amounted to over £345,000 per annum, £228,000 from domestic supplies and £117,000 from trade or measured supplies. The number of houses supplied was 179,691 with an estimated population of 898,000. In addition there were 5,136 metered supplies.

Total length of mains laid in the Company's area of supply had risen to 1,115 miles, 241 miles of pumping main and 874 miles of distributing main.

Well supplies still in use in 1930.

A publication called *The Wells and Springs of Worcestershire*, by L. Richardson was published in 1931, giving locations of existing sources of supply of the County.

Included in the area covered by the Company were;

Halesowen; There were still a number of private wells in use and some rain water cisterns. A public pump at Spring Hill was dismantled in 1907 after an outbreak of enteric fever. Another pump opposite the foot of Bundle Hill on the east side of Love Lane, stands over a shallow well which intercepts a perennial spring. The pump was repaired in 1923 to serve as a standby to houses in the vicinity in time of drought.

Hasbury; A lamp post, formerly a public pump, marks the site of Wall Well, a spring earlier flowing from an arched recess and reached by incline on each side.

St Margaret's Well is a private well in the grounds of a house recently erected, and is a spring issuing from the Halesowen sandstone at the junction of two faults, one hundred yards south west of Blackberry Lane and Hagley Road. It was referred to as a well of good, cold, mineralised water by T Nash in 1781.

A well at 304 Hagley Road is 60 feet deep and 32 feet to the water, it supplies two houses in time of drought.

Hill and Cakemore; An uncovered well at the corner of Spies Lane and Victoria Avenue is eight feet deep. The water which rises to over five feet is adequate and good.

Olbury; forty to fifty wells in use for drinking purposes, between 1920-1924, twenty five to thirty wells were closed, not because of pollution but owners were having water closets fitted in preference to privies. Lime Pit Bank Spring supplies water to Lime Kiln Cottages in Birchfield Lane. Another well exists at 95, St James Road, Rounds Green.

Romsley Tower.

The erection of the water tower on the summit of Romsley Hill in 1931 aroused considerable indignation in the district because it was contended that it was a blot on the skyline and spoiled a marvellous rural view. At a meeting of Bromsgrove Rural District Council, strong complaints were voiced. The tower was called a "horrible erection" and a "disfigurement" and the Clerk was instructed to write to the Company expressing the council's surprise and disgust at their action in placing the tower in that situation. They also suggested that in future the Company submit plans for any works contemplated.

Romsley Tower, which replaced a tank on the same site, was built in order to meet the Company's obligations. In particular, it was required to give an adequate supply of water to the Sir William Cook Sanatorium and generally to meet the demands of the houses on Romsley Hill. Birmingham Corporation had also requested an improved supply to deal with the development of the district around the hill. Petitions were organised by the local inhabitants both for and against the erection of the tower. Prior to the tower being built, some houses in the neighbourhood received a supply of water to the ground floor room only and if water was required on some other floors it was either pumped or carried there. Romsley Tower, built between 1930 and 1931 by James Gray and Company of Glasgow at a cost of £2,406. 2s 7d, having a capacity of 70,300 gallons.

Newspaper headlines of October 1986 in the "Evening Mail" read "Hide blot on the landscape Tower" plea. Romsley Tower had been painted several shades of blue and this had made the councillors of Bromsgrove see red. They claimed it now sticks out like a sore thumb on the Clent Hills skyline and asked the Company to explain how such a colour scheme was chosen for such a prominent landmark.

The tower had five colours ranging from dark blue to white with a wavy line around the middle. Romsley Parish Council and the local inhabitants had been consulted by the Company prior to work being carried out on the tower, which had shown traces of slight leakages and was in need of renovation. A tree screening scheme was agreed upon to ensure the tower blended in with its surroundings.

Waste water department set up.

22.87 gallons was the average daily consumption per person in 1931 compared with 25.80 gallons in 1921. This reduction was mainly due to the introduction of a comprehensive system of waste detection during the years 1922 - 1927. During 1922, ninety four waste detection meters were installed and thirty additional inspectors were engaged on the waste detection staff. By the introduction of a better class of water fitting and by testing and stamping all water fittings before being fixed, it was possible to reduce the consumption of water still further.

The 1932 Act of Parliament.

At a special meeting of the Company in January 1932 a resolution was passed approving a Bill to be introduced into Parliament to secure authority to construct new works, raise additional capital, to extend the limits of supply and for other purposes.

H.K. Beale, who presided said powers were required to construct a new well and pumping station between Tamworth and Ashby-de-la-Zouch to help supply the district of Burton and the neighbourhood, reporting that from experiments made, the well should be quite successful.

This step was required to provide a reserve supply to Burton, highly necessary because the town was at that time, served by a pipeline running twelve miles along a main road, and the Company was apprehensive that if any accident were to happen to the main, the supply to Burton would be cut off. They also wanted powers to construct various trunk mains, to provide new or duplications of existing reservoirs, one at Langley and one near Dudley.

Powers were also required to extend the limits of supply to include the parishes of; Armitage, Colton, Elford, Hamstall Ridware, Haselour, Kings Bromley, Longdon, Mavesyn Ridware, Pipe Ridware, Tamhorn, Yoxall and part of the parish of Farewell and Chorley in the rural district of Lichfield and the parishes of Anslow, Dunstall, Rolleston and Tatenhill in the rural district of Tutbury, all in the County of Stafford, and the parishes of Bearwardcote, Burnaston, Catton, Coton in the Elms, Egginton, Etwall, Hilton, Lullington, Rosliston, and Walton upon Trent, in the rural district of Repton in the County of Derby. These parishes had approached the Company for supplies because they were not in a position to provide works themselves economically.

For these purposes, H.K. Beale said, they would want additional capital, and they were going to ask for £500,000. It was possible Parliament would not give them so much, but he thought they ought to. The issue, he thought, would be made at the end of the year and shareholders would have the opportunity, which, he believed, having regard to the success of the Company they would be pleased to have, of taking up more capital at this time.

Twenty six Local Authorities took joint action against certain provisions of the 1932 Act of Parliament and a combined petition was prepared. The main grounds for opposition was the possibility of an increase in the water charges and many considered that the time had arrived when a reduction should be considered, while there were other provisions in which other local authorities felt they had a right to protection. Opposition had been urged by the Association of Midland Local Authorities.

Considerable concessions were secured as a result of the joint action of the local authorities. Negotiations were conducted for some weeks between the Company and the authorities and although the Company were not able to secure all the revisions they desired, they secured amendments which were of considerable material value to the general body of water consumers. The Company agreed to give what the petitioners considered to be a valuable concession, by undertaking the obligation for the repair and maintenance of all communication pipes laid in the highways. At that time the consumer had the responsibility for repair and maintenance.

Another concession was the insertion of a new clause dealing with the revision of rates for the supply of water. The clause stated that the first and any subsequent valuation list under the Rating and Valuation Act 1925, or any Act amending that Act, shall be deemed to be a circumstance affecting the undertaking.

The negotiations were friendly and the confidence of the representatives of the local authorities was summed up in the words of one of the leading figures. " The Company has never gone back on any promise they have made to us ".

As a result of the opposition to the Bill being withdrawn, it was referred to the House of Commons Select Committee on unopposed Bills for consideration at an early date.

Reporting on the Bill, the Ministry of Health suggested that a clause should be inserted imposing a time limit on the Company in respect of the execution of the works for which they sought power. As a result, the Committee ordered the insertion of a proviso to the effect that if in seven years the Company failed to supply the rural parishes in the extended area the local authority would be at liberty to apply to Parliament for powers. Subject to this and minor amendments the Committee found the preamble proved and ordered the Bill to be reported for third reading. The Bill was read, and passed the third reading on March 10th 1932.

Cawney Hill No. 2 Reservoir, works No. 8 of the South Staffordshire Waterworks Act of 1932, was constructed to augment, by two million gallons, the storage provided in the Cawney Hill No. 1 Reservoir. The site was chosen because, at Dudley's highest point, water would gravitate into supply with a reasonable head of pressure. Land for the reservoir was purchased from E. Guy for £560.

William Moss and Sons of Loughborough arrived on site in July 1933 to sink trial shafts to determine geological conditions. Construction difficulties of the reservoir were expected, due to the site having previously been in use as a quarry filled with debris during the previous eight years.

Tenders were invited from six companies experienced in a class of reinforced concrete work that was called for, in this special construction. The contract was finally awarded to Thomas Lowe and Sons of Burton on Trent, after that company agreed to amend their tender to £21,289.

Prior to the construction of the reservoir, the original rock of the site, was quarried out below the bottom level of the proposed receptacle, in order to obtain a sound and stable foundation. Following on from this one hundred and ninety eight piles were driven into the ground to obtain good support for the main beams of the construction. The method adopted was the Frankie Pile Compressed Pile System, this being the most economical and satisfactory available at this period.

A circular hole, roughly twenty two inches diameter, was punched into the ground by a three ton torpedo shaped "monkey" of variable drop, driving a two feet thick "plug" of fairly dry concrete, inside a vertical steel shell, twenty inches diameter, both starting from ground level without preliminary excavation. As this "plug" was punched or driven through the subsoil, at the rate of about six or nine inches per blow of the "monkey" dropping about 15 feet per blow, it took the shell with it. This operation continued until the settlement or "set" of the shell was less than a quarter of an inch for ten successive blows of the "monkey" on a four foot drop.

The shell was then prevented from going lower, but ramming continued and fairly dry concrete fed at intervals into the shell. This concrete was consolidated to form a bulbous toe or base, around three feet diameter, ramming being continued until the concrete could no longer be driven either downwards or outwards. Virtually the pile was thus driven to refusal.

The shaft of the pile was then formed by adding twelve inches depth of concrete at one time inside the shell, raising or withdrawing the shell nine inches for each twelve inches of concrete and ramming the concrete solid by means of the "monkey" dropping inside the shell. These operations continued until the pile was formed to the required level. The finished pile was about twenty two inches in diameter. A twenty foot pile took thirty five minutes to drive and forty minutes to fill and ram, not including time for manoeuvring the plant into position. The longest pile was thirty one feet and the shortest approved pile fourteen feet. The piling plant was heavy and cumbersome, the frame being moved on long rollers which ran on a network of rolled steel joists. It was surprising how accurately the heavy plant could be adjusted to the required positions for pile driving.

Three steam winches were mounted on the frame, one to operate the torpedo shaped "monkey" which was sixteen feet, nine inches long, thirteen inches in diameter and three tons in weight, another to operate the steel shell and the third to raise and lower the concrete skip. Each pile was guaranteed to carry a load of 80 tons and tests to prove this were carried out by loading with pig iron. On completion, the covered reservoir was 185 feet long by 95 feet wide and at full capacity the depth of water was 20 feet.

Cawney Hill Reservoirs Nos. 1 and 2 were interconnected by pipework to enable use, either in conjunction or singly. Top water level of the reservoirs were the same, namely 824.3 feet above ordnance datum. The early cast iron tank at this location, remained unused until sold to William Kayley Ltd. for £170 in 1937.

The original pumping plant installed at Cawney Hill in 1911, consisting of two small gas engines driving three throw ram pumps, was only capable of pumping 70,000 gallons per unit twenty four hours, and as the district which was supplied from this pumping station was growing rapidly and the plant incapable of meeting the demand, it was recommended that two automatically controlled electrically driven pumps be installed, capable of pumping 140,000 gallons per twenty four hours. Messrs. Mather and Platt's tender amounting to £307 for the pumps and motors was accepted. The whole cost of the installation including house, pumps, motors, control gear, valves, gauges etc. was £1,200. As the plant was automatically controlled only two hours attention each day was required, compared with sixteen hours previously when two enginemen were required. This plant was operational from October 1937

Take over of Rolleston Waterworks Company.

The first water supply to Rolleston, Burton on Trent, consisted of a well, borehole, a small pumping station, mains and a small open reservoir. The whole of these works were provided by Sir Oswald Moseley of Rolleston Hall.

In 1912, in an effort to improve the water pressure to the village, Sir Oswald arranged for the Rolleston Water Tower to be constructed on a site adjoining the open reservoir. Standing fifty feet high, with a capacity of 45,000 gallons, the tower was constructed of reinforced concrete. With the eventual disposal of the Moseley Estate, the water supply to the village was taken over by the Rolleston Water Company Limited. This undertaking was acquired by the South Staffordshire Waterworks Company on 11th of November 1931 and confirmed by their 1932 Act of Parliament. Rolleston Tower was repaired and remodelled to be operational in June 1933, the lower part of the construction being let as dressing rooms to Rolleston Swimming Club, who had purchased the open reservoir for use as a swimming pool. Rolleston was first supplied from the Burton on Trent system in October 1932.

Water tower constructed on Cannock Chase.

Pye Green concrete tower, sixty five feet high, stands a prominent landmark nearly 800 feet above sea level and a stone's throw from Pye Green village on the edge of Cannock Chase. The site was purchased from Charles Phillip of Huntington Farm in 1935. The tower, constructed at a cost of £4,202, was erected to improve the supply to the high level area to the north west of Hednesford. It has a capacity of 60,000 gallons, the diameter of the tank being thirty two feet and the maximum depth of water eleven feet nine inches. Pye Green Tower is filled by re-pumping at the Pye Green Pumping Station from the Gentleshaw system.

As the tower was in a mining area, the possibility of subsidence was kept in view, and there was several features in the design to detect this. The columns rested freely on exposed bases which formed part of a strongly constructed foundation, and in the event of the tower subsiding unevenly, three recesses were provided, distributed at equal intervals round the base of the screen wall, where jacks could be fixed and operated to restore the tower to a vertical position. A plumb bob device was fitted in the tower to record any movement from the vertical. The construction of the tower was carried out by Messrs. Gray's Ferro Concrete Company Ltd.

A local resident wrote to the Engineer in 1936;

I have greatly admired the design of this structure which is certainly the finest example of utility construction that I have so far seen. I am sure that the S.S.W.W. must have the thanks of all Chase lovers for the artistic merit of a work which could so easily have been an eyesore. As a lover of the Chase I feel the view from the top of this tower must be superb and as an engineer I am intrigued as to its internal arrangements.

Station constructed at Sandhills.

Sandhills Pumping Station, Shenstone was built in 1935 by Thomas Lowe and Sons Ltd. on land purchased from Frederick Paddock of Walsall. Over seven acres of land were purchased for £517. The two boreholes are each 531 feet deep going down into the bunter sandstones and pebble beds, commencing at a diameter of 48 inches and reducing at various stages until at the full depth of 531 feet, the diameter is 20 inches. Borehole No. 1 was lined with solid lining tubes to 56 feet, is unlined from 56 to 381 feet and has perforated tubes from 381 to 520 feet. Borehole No. 2 is lined with solid tubes to 59 feet, is unlined from 59 to 394 feet and has perforated tubes from 394 to 490 feet. Below the base of the perforated tubes both boreholes are unlined.

The pumping plant was supplied by Mather and Platt Ltd., and consists of two pumping units one in each borehole, comprising a 7 stage borehole pump and a 6 stage booster pump mounted on the same vertical shaft driven by an A.C. commutator motor. Each set is capable of delivering one million gallons against a total head of 620 feet from any depth down to 250 feet in the boreholes.

Contractor for the boreholes was Messrs.C. Isler and Company of London. Thomas Lowe and Son also constructed the transformer house, office, workshop and cottages. Water from this source was pumped into Barr Beacon Reservoir.

Sutton Coldfield object to works in town.

No works have ever been erected by the Company in the town of Sutton Coldfield, except for extensions to the Depot, Nr 27, Coleshill Road, although at least two attempts have been made.

In 1935 F.J. Dixon wrote to the agents for the Ecclesiastical Commissioners, William, Fowler, Bewley & Company, requesting them to make an approach to the commissioners for permission to put down a trial boring on a piece of land in Withy Hill Road, Sutton Coldfield. The Wheatmoor trial twelve inch boring, carried out by Messrs. C. Isler and Company was to prove the stratification and thickness of the water bearing rocks. Pumping tests to determine the water quality were carried out over a four day period in January 1936. The pumping rate was 6,500 gallons per hour, water being discharged into lagoons over the grass field prior to it entering an adjacent brook. Although powers were sought to develop the site in the Company's 1936 Act of Parliament, the section was withdrawn, following opposition from Birmingham City Council and Sutton Coldfield Council.

H.K. Beale was in a precarious position, as Chairman of the South Staffordshire Waterworks Company and a member of the Birmingham Corporation Water Department Committee, proposing on one hand and opposing on the other.

In 1954 a report was submitted outlining a scheme for improving the supply to Sutton Coldfield by means of a water tower at Pilkington Avenue. This was later amended to an underground service reservoir and booster station as the result of a planning objection.

In August 1954 the Board resolved to obtain planning consent for an underground reservoir of 300,000 gallons capacity, together with a booster station at the site at an estimated cost of £35,000. Planning consent was subsequently obtained and a plot of land 3,280 square yards in extent was purchased in 1954 for the sum of £2,460. The conveyance of the land included a covenant which restricted its use to the construction of a reservoir, booster station and ancillary works.

The original 1954 scheme for augmenting the supply was deferred and reviewed in 1961. In the light of conditions experienced from 1954 - 1960 it was concluded that the scheme in its original form would be too limited in its scope. It was accordingly abandoned in favour of a new eighteen inch diameter feeder main, from the Barr Beacon trunk main system, through Sutton Park, the contract being carried out by Norwest Construction Company Ltd. The land at Pilkington Avenue became surplus to requirements, the restrictive covenant was eventually set aside, and the site sold.

The 1936 Act of Parliament.

Notice was given in December 1935, that application had been made to Parliament in the present Session, by the Company, seeking powers to raise additional capital and to increase the borrowing limit, to provide for the construction of new works and for the general purposes of the undertaking.

The 1936 Act of Parliament proposed to increase the present authorised capital of £2,298,060 by £300,000 with power to borrow a further £150,000 on that capital. It was also to confirm the power of the Company to borrow to the extent of £1,050,693 inclusive of £776,969 already raised by the issue of debenture stock.

The works were; wells and pumping stations at Kinver, Seedy Mill and Sutton Coldfield, mains extensions in Brierley Hill, Cannock, Aldridge, Kinver, Brindley Heath, Curborough, Elmhurst, Longdon and Shenstone, a water tower in Oldbury, and extensions to the limits of supply to include Abbots Bromley, Blithfield, Draycott in the Clay, Kingstone, Marchington, Newborough, Hanbury, Clifton Campville, Drayton Bassett, Edingale, Harlaston, Thorpe Constantine, Austrey, Middleton, Newton Regis, Seckington and Tamworth.

One other important issue included in the Bill, was the transfer to the Company of the ownership of communication pipes, that is to say so much of service pipes that lay between the mains of the Company and the stoptap, if any, or the boundary of the street, or the point at which such pipe enters any premises, in or under the street, whichever of these points is the nearer to the service main, and extension of such points, or the rights and obligations of the Company with respect to pipes laid down by them including the exclusive rights of the Company to provide communication pipes, and to break up streets therefore and conferring on owners of supply pipes, not being communication pipes, the right to break up streets for the purpose of repairing such supply pipes.

Following a meeting of the Association of West Midland Local Authorities, assembled to discuss the proposed Bill, and some minor amendments, the Bill was unopposed on its passage through Parliament.

Additional supply afforded to Burton on Trent.

Chilcote, authorised by the 1932 Act became operational in 1937 after completion of building work by Thomas Lowe and Sons. C. Isler and Company Ltd. of Bear Lane, Southwark Street, London, commenced sinking the boreholes on April 19th 1933 and completed both by October 3rd 1935. During the operations, pumping was necessary to keep down the level of the water in the boreholes, the water table in the trial borings was found at only one foot eleven inches below ground level.

Pumping plant was supplied by Mather and Platt Limited of Manchester and consisted of two electrically driven vertical spindle five stage centrifugal borehole pumps.

Chilcote had been put forward for the purpose of providing an additional supply to the town of Burton on Trent and the surrounding districts and as an alternative supply to that obtained from Fradley Pumping Station. There had been a steadily increasing demand for water in Burton and the local authority had requested the Company to extend its limits of supply so as to take in the four parishes of the Tutbury Rural District and ten parishes in the Repton Rural District and Etwall and Tattenhill. Repton Rural District Council requested extensions of mains to supply Willington and Findern, following on from extensions to mains to supply Castle Gresley, Linton, Repton Village and Newton Solney in past years. An increasing demand for supplies to Burton had also been brought about by the conversion of dry closets to the sewer system, in the ten years up to 1931. The total number converted was 3,300 with further conversions in progress.

Under the South Staffordshire Waterworks Act of 1866 (Section 16), no well or new source of supply can be put down within a radius of seven miles of Burton on Trent Parish Church. This resulted in a careful survey of the whole district south east of the town being carried out. The only site available, where an estimated daily supply could be reasonably assured, was at Chilcote, about nine and a half miles distant from Burton.

F.J. Dixon and Professor Boulton, an eminent civil engineer, selected a site in a field abutting the road from No Mans Heath to Netherseal, half a mile due south of St. Mathews Church, Chilcote. Recent borings carried out in the area for proving coal measures revealed a thickness of over 700 feet of Trias. These records supported the choice of site as, geologically, there was every indication of a good supply of underground water.

The field, later acquired, formed part of the Chilcote and Stretton Estates belonging to Christopher Spalding of Burton on Trent, who in June 1931, agreed to the Company putting down a trial boring and carrying out pumping tests for the purpose of ascertaining the probable yield and the quality of the source. After boring to a depth of 805 feet, two pumping tests were carried out and the results proved satisfactory, both as regards to quality and quantity. A decision to sell the site to the Company was made after assurances were given that the supplies to the wells and springs, etc. on the Chilcote and Stretton Estates and Chilcote Village would not be affected. The supply to the estate at that time was derived from springs in the new covert. Water was collected in a chamber at the edge of the covert and two pipes led from this, one to the hydraulic rams and the other to a brick sump on the edge of the brook. From this sump a windmill pump and a petrol pump both drew their supply and delivered it along a two inch pipe to a tank on Stretton Hill Farm.

Water gravitated from the tank to supply the farm, Park Farm and Stretton Hall. Chilcote village was supplied by a hydraulic ram near the fishponds opposite St. Mathews Church, the ram being fed from a spring in the hill, on which the village stood, and pumped to a tank at the east end of the village. The working of Chilcote Pumping Station, was subject to certain conditions imposed by Parliament for the protection of wells and other sources of supply within a radius of two miles of the station.

Hanbury Tower built.

The village of Hanbury was carefully examined for a possible site for a water tower. It was observed that practically the whole of the area was honeycombed by alabaster mining. The only suitable site was one occupied by William Shelley of Rookhouse, Hanbury, who was a Councillor on Tutbury Rural District Council. Twelve hundred square yards of ground at two and sixpence a yard was purchased for the purpose of erecting a reinforced concrete tower. It was constructed between 1937 and 1938 at a cost £4,613.

New reservoir at Walsall.

The use of open reservoirs created problems at Walsall during the 1930s. The development of land surrounding the Walsall Reservoir for industrial and housing purposes led to the open surface being in contact with industrial fumes and being subject to the usual deposit from the atmosphere in thickly populated areas.

The incoming water, pumped from Sandfields and Trent Valley Pumping Stations, was partly filtered, making it liable to deteriorate when exposed to sunlight, and as the rough pitching forming the lining to the interior slopes was a favourable breeding ground for numerous varieties of water insects, the question arose as to the necessity of covering and lining this large reservoir, which acted as a balancing reservoir on the Lichfield - Walsall - Wood Green System. As the conditions of supply at that time were very different from those appertaining at the time of the construction of the old reservoir, it was felt that one of a much smaller capacity would meet the case, so instead of reconditioning, covering and relining the old reservoir it was decided to construct, within the existing receptacle, a covered one of six million gallons capacity, so placed that a second reservoir of similar capacity could be constructed alongside as and when required.

In order to maintain the supply during the construction of a new covered reservoir, a small covered reinforced concrete service reservoir, known as Walsall No 1, with a capacity of 658,000 gallons, was constructed adjacent to the site, but external to the original Walsall Reservoir.

Walsall No. 1 Reservoir was brought into commission on 26th September 1936. The receptacle, approximately rectangular in plan and similar to Cawney Hill Reservoir No. 2, had dimensions of 74 feet 8 inches x 65 feet x 23 feet 8 inches deep, top water level was 490.27 A.O.D.

Walsall Reservoir No. 2 was constructed within the original reservoir in 1938 by Messrs. Grays Ferrow Concrete Limited of Glasgow who were the main contractors, the pre-erected steelwork was supplied and erected by Messrs. Horseley Bridge and Thomas Piggott Ltd. Its capacity is 6,010,000 gallons, with a top water level of 486.37 A.O.D. and it was constructed in re-inforced concrete of the latest type of design in which the steel re-inforcement consisted partly of rolled steel sections which formed a rigid frame having the form of the final structure. The dimensions of the reservoir are 279 feet long x 174 feet wide x 20 feet deep. A baffle wall running longitudinally along the centre of the receptacle ensures a continuous circulation of the water with no dead areas.

A start made on the River Blithe Scheme.

Suitable underground sources of water supply within and adjacent to the Company's area of supply had practically been exhausted and it was thought that future supplies would have to be obtained from surface sources. Consideration was given to a proposal to utilise the River Blithe, which joins the River Trent one mile south of Hamstall Ridware which is about six miles due north of Lichfield.

The River Blithe rises at a level of some 800 feet above sea level, some three miles north east of Longton in the Potteries, and flows roughly in a south easterly direction for approximately twenty miles to its confluence with the River Trent near Hamstall Ridware. The catchment area is approximately 41,000 acres or 64 square miles, with an average rainfall of about 28 inches.

Readings had been taken on a very rough constructed existing weir near Hamstall Ridware, which showed that the average flow would be approximately twenty million gallons per day. In order to obtain an accurate figure for the discharge it was proposed that a proper flume be built and accurate gaugings obtained, approval for this was sought from the Trent Fishery Board and the Trent Catchment Board.

At a Board Meeting held 29th July 1937 it was resolved that the Engineer proceed at once with the necessary survey, plans and statistics with a view of making a report as to the practicability of obtaining supplies from the River Blithe. It was further resolved that Edward Wilson Dixon, M.I.C.E., Consulting Civil Engineer of East Parade, Leeds be appointed Joint Engineer to prepare the necessary scheme and to carry out the works if sanctioned by Parliament.

The River Blithe Scheme involved an enormous amount of preparation prior to the application to Parliament during the session 1938/1939 for powers to carry out the work. This ambitious measure empowered the Company to impound and use the River Blithe and authorised the construction of Blithfield Reservoir, near Abbots Bromley.

Several parcels of land and easements were required in connection with the site for the scheme at Blithfield Hall, belonging to Lord Bagot. A letter was received from His Lordship's Agent in May 1938, raising strong objection to the sale of two hundred acres of land, some three hundred yards from the Blithfield Hall premises. It intimated that Lord Bagot would strenuously oppose any application to Parliament for compulsory purchase of the land but would be willing to sell the whole of his estate comprising 1,612 acres for the sum of £75,725. This worked out at £47 per acre. The Board was strongly advised to accept the offer in order to protect the gathering ground adjacent to the proposed reservoir. Colonel Saint, Lord Bagot's Agent, was contacted in June 1938, and offered £75,000 for the premises, Lord Bagot to have the right to reside at the Hall for two years from the signing of the contract. The family succeeded in buying back the house and part of the park at a later date, which far from being spoiled had been enhanced by the view of the reservoir in the valley.

The Bagot family and their ancestors the De Blithfields had been at Blithfield from the year 1086 and owned the neighbouring Bagots Bromley. With the purchase of the site agreed, a considerable amount of ancillary works were carried out at the site during the War years, but labour shortages seriously curtailed the development.

Typhoid deaths at Croydon, and the need for sterilisation of supplies.

In 1938 the Ministry of Health issued a circular, reminding water undertakings of the serious implications and the necessity of sterilising supplies.

Sterilisation of water by chlorine was first used, as an emergency measure in 1897 at Maidstone, Kent, following a Typhoid fever epidemic.

Following a pollution problem in Cambridge in 1906, a Bill was presented to Parliament for authority to apply Chlorination treatment. The Bill was rejected by the House of Lords Committee who were uncertain of the consequences.

Reading became the first water undertaking to apply sterilisation treatment to the whole of the water supply in 1910. A typhoid epidemic started in Croydon in October 1937, by the end of the month there were four definite and two suspected cases. After this the number of cases grew rapidly and the town reached a state of alarm bordering on panic. The source of the problem following tests, was found to be a well at Addington, and on November 4th this supply was cut off.

In January 1937 there had been a fatal accident at the well when a workman had fallen to the bottom. When repairs were effected at the site in September 1937, workmen were naturally disinclined to work in the well, and volunteers were called for. One workman employed turned out to be a typhoid carrier a disease contracted during the war and who was unaware he remained an active carrier. While work on the well was carried out water from the source unfiltered and unchlorinated was being distributed. The infected water was stored in cisterns of houses and by December 30th there were 289 cases and 31 deaths, this total rose to 344 cases and 43 deaths by February 1938.

Later, an enquiry cited a lack of communication between the officers of the Corporation. The men selected for the work, contractors, were not familiar with the high standard of care in connection with water that members of the waterworks staff possessed.

New development near Lichfield.

Seedy Mill Borehole Pumping Station, built on ground purchased in 1930, came into service in 1939 and derives its supplies from the Keuper and Bunter Sandstones. C. Isler and Company Ltd. were the contractors for the two boreholes which are 808 feet and 760 feet deep respectively. Both boreholes are lined for the first 164 feet with 44 inch diameter solid lining tubes and the next 170 feet with 40 inch diameter slotted lining tubes. Below 334 feet depth they are 29 inch diameter unlined. The pumping plant comprises two duplicate electrically driven borehole and booster pumps, the borehole pump deliveries being directly connected to the booster pump suction. Each borehole pump was designed to pump up to one and a half million gallons per day against a head of 632 feet. The pumps were supplied by Sultzter Bros., London, Ltd. and the motors by the British Thompson-Houston Co. Ltd. Thomas Lowe and Sons Limited of Burton on Trent constructed the station.

Tower built at Warley.

Works No. 10 of the 1936 Act was Warley Tower. In 1935 overtures were made to Birmingham Corporation to purchase a small parcel of land containing some 1,450 square yards, in the north east corner of their Warley Reservoir site, for the erection of a water tower with a substantial capacity, having a top water level of 60 feet above ground level. In considering the inquiry the Birmingham Corporation requested drawings which were submitted by the Company. The drawings revealed that the water tower would be erected on the Galton Estate on which there were certain restrictions regarding the height of the buildings etc. Included in the indenture between the Estate and Birmingham Corporation, dated August 1900 in respect of the sale of the Warley Reservoir site, there was a restriction that "in no circumstances shall the Corporation build, or suffer to be built on the land, any chimney or shaft which shall exceed 35 feet in height" and also that "any buildings or erections whatever, other than the two valve houses and two caretakers cottages, shall be built in accordance with the plans and elevations to be submitted and approved by the Galton Estate".

On the height restriction it was pointed out that the Roman Catholic Church had been erected on the estate with a tower of which was 113 feet above ground level. Agents and Solicitors for the Estate were approached regarding the water tower proposal and all were favourably disposed to waiving the restriction.

The water tower is situated in Harborne Road, the land on which it is located, was purchased from Birmingham Corporation in 1937 for £421. In 1940 Warley Water Tower was built by Messrs. Grey's Ferro Concrete Company Ltd. of Glasgow, at a cost of £8,987-9s-3d. All of the pipework and connections however, were installed by the Company. On completion it was immediately painted a green / grey colour as camouflage for the Second World War. The tower has a capacity of 200,000 gallons of water, the depth of the tank being fifteen feet. Water in the tower comes originally from Shavers End Reservoir via Langley Reservoir, where it is boosted to the tower for storage, to be used as a back up and standby feed for the higher parts of the Warley area.

The Second World War.

The first signs of another war came in October 1936 when a letter was received from the Ministry of Health enclosing correspondence from the Home Office, requesting information regarding the Company's Works, in considering their proposals for possible protection against air attacks.

In the spring of 1939 it became obvious that the Second World War was near. At this time the area of supply extended some four hundred and sixty seven square miles and there were one thousand six hundred miles of mains, thirty pumping stations and twenty seven reservoirs and water towers.

The Company like other public utilities entered a difficult period. Under the Government's Civil Defence Bill of 1939, certain obligations were imposed on public utility undertakings, providing for protection against hostile attack. It was thought that the British Waterworks Association would prepare a general scheme but they decided that each waterworks undertaking would have to prepare its own scheme. As the area of supply extended over a wide area with considerable plant and works, F.J.Dixon had to provide a comprehensive scheme of protection covering a wide range. These included the provision of shelters for employees which had to be in the course of erection or completed by September 1939. In addition there were certain provisions relating to the maintenance of a full supply of water which necessitated the provision of mobile pumping plant, fire equipment, respirators and protective clothing, lighting restriction blinds, first aid and decontamination equipment. One other important provision was the inter-connection of water mains with neighbouring water authorities which included Bilston Corporation, Stourbridge and District Water Board, Stafford Corporation, Birmingham City Water Department and East Worcestershire Waterworks Company. The estimated cost of protecting the whole of the works and employees of the Company was £89,072

Hundreds of gas masks and steel helmets were ordered and forty eight thousand sandbags required filling and placing in position at offices and various pumping stations. Several concrete shelters had to be erected at the head office in Sheepcote Street, all the depots, Wood Green and selected pumping stations. The basement of the Head Office was reinforced for use as an air raid shelter. Anti-gas training and respirator drill was carried out by most Company employees and first aid training given.

Fifty six emergency water schemes were made available including supplies at Dudley Zoo, M.E.C. Pool, Tipton, Victoria Park, Tipton, Baggeridge Colliery, Sedgley, Sedgley Gas Works Springs, six- four hundred gallon tanks at Queslett Sands and the Gravel Pit Source at Aldridge, and a similar scheme at Wednesbury. At Walsall, Reedswood Open Air Baths formed part of the scheme.

Duplicate pumping plant was installed in separate buildings at many locations to avoid serious interference to supplies to the district in the event of bombing action putting plant out of commission. Several water towers were camouflaged, the roofs of both Wednesbury and Shire Oak Reservoirs had no soil covering and concrete surfaces were exposed making it necessary to camouflage these too. An order was issued to the Company to remove or cover up all place names on the buildings, the Company's title was not included.

Preliminary air raid warnings were given to the depots and pumping stations, at Bourne Vale a siren was fixed for warning the local inhabitants. Air attacks on targets in the Birmingham area took place throughout the wartime period. Notable incidents when considerable damage was caused to the Company's works included air raids on the nights of November 19/20 and 22/23 1940 when very severe and considerable damage to mains occurred in the West Bromwich and Smethwick areas.

In all twenty eight mains were affected; in West Bromwich, one - twelve inch, two - six inch, one - four inch, five - three inch, one - two inch, in Smethwick, one - eighteen inch, two - fifteen inch, two - twelve inch, three - six inch, three - four inch, four - three inch, and in Rowley Regis, one - four inch, one - two inch and at Tipton one - two inch.

In May 1941 the twenty inch main from Wood Green to Tipton at the junction of Horseley Road and Bridge Road was blown up. The repairs took forty eight hours to be completed as there were serious complications arising from simultaneous fractures of the thirty six and the sixteen inch gas mains which were on fire. Little work was done on the first day owing to the escape of gas. The failure of the main resulted in the closing down of Sandfield and Wood Green Stations for forty eight hours.

In April 1941 ten pipe lengths of the twenty four inch main in Walsall Road, West Bromwich were blown out of the ground as the result of two highly explosive bombs exploding within four yards of each other. The considerable uplift of the forty yards of main took three days to repair. One other notable incident occurred in November 1944 at Hanbury, when shortly after 11a.m., a serious explosion at the Royal Air Force bomb dump at Fauld, near Hanbury, caused extensive damage. The Company's works escaped comparatively lightly, falling debris and bombs caused seven fractures in the Company's mains, six - six inch and one - four inch, feeding the surrounding district and there were two near misses at Hanbury Tower, one within three yards of the building. The water supply to the area was completely cut off and an emergency supply was afforded by means of water tank lorries. The waterman's house was badly damaged by blast and debris. Blast from a bomb dropped on the golf course at Warley, smashed the door and blew out windows at Warley Tower. A land mine that fell near to the Smethwick offices was successfully defused.

Fractures of the water mains by explosive bombs created a great danger of pollution to water supplies, in many cases other services such as gas and sewers were running in the same trench. Prior to being put back into service, mains and services had to be sterilised to a high degree. Mains damaged by bombing took four times longer to repair than ordinary fractured mains, the damage being much greater and craters had to be back filled prior to repairs being effected.

Under the National Service Act of 1939 certain of the Company's employees were liable for National Service. The Board resolved that any employee of the Company who was called up for full time service should receive such salary or wages that with Government pay should be equivalent to the salary or wages he was receiving from the Company at the time of call up. In the first three months of the war twenty eight employees, seven staff and twenty one workmen were serving with H.M. Forces.

In July 1940 the Ministry of Health issued a circular to all Water Undertakings in the country dealing with the chlorination of water supplies, which implied that all supplies should be treated prior to distribution.

As the Company's twenty two main sources of supply were obtained from the new red sandstone formation, Engineer F.J. Dixon was of the opinion that it was unnecessary to chlorinate the water at those stations which showed no likelihood or possibility of pollution.

At this time chlorination apparatus was in use at four of the twenty two stations; Sandfields, Slade Heath, Moors Gorse and Shenstone. The Engineer communicated with the Ministry of Health but they held that the Company could not be released from their obligations. Orders were placed with The Paterson Engineering Company and Wallace and Tiernan for the provision of plant. At a later date the Company were released from the obligations because of special circumstances of chlorinating water from Kinver, Prestwood, Sandhills, Seedy Mill, Slitting Mill and Somerford.

In reviewing the year 1942 it was reported that from twenty one sources of supply 11,449,710,000 gallons of water were pumped during the year, which was distributed to approximately one and a quarter million people and included bulk supplies to eleven neighbouring water undertakings to the extent of five hundred million gallons.

At this time the workforce was required to undertake their full quota of external duties including night and day attendance at the Control Office, Civil Defence, Fire Guard and Home Guard.

In reference to the Home Guard the strength of the Company's Unit was three hundred which was ably controlled by Major H.R. Bateman the Company Commander together with Junior Officers. Practically all the Company's major pumping stations were guarded each night and day, the turn of duty being one night in six. In addition to this there was a parade every week in all districts, mostly on Sundays.

Fire guard duties were discontinued in September 1944 and compulsory Home Guard duties were relaxed and carried out on a voluntary basis.

An influx of evacuees into the area in 1944, caused an embarrassment to the Company, the estimated number was over 25,000. At fifteen gallons per head per day this represented an increased consumption of 375,000 gallons per day which at times seriously jeopardised maintenance of a continuous supply.

Preliminary works on the Blithfield Scheme had been carried out during the war years. Owing to the increasing demand for water and the approaching completion of the laying of the thirty three inch Blithfield to Seedy Mill main, in 1943 the Board resolved that the Engineer be instructed to proceed with that part of the original scheme at Seedy Mill to deal with purification works and pumping units in accordance with the preliminary plans submitted by F.J. Dixon at an estimated cost of £60,000.

Tenders for the first part of the filtration works were considered and accepted subject to the receipt of the necessary authorisation from the Ministry of Health to proceed with the work.

Purification Plant; Patterson Engineering Company Ltd.	£14,150
Electrically Operated Pumping Plant; Sultzer Bros.Ltd.	£2,485
Electrical Equipment; British Thomson Houston.	£3,900
Purification Works & Pumping Station; Thomas Lowe & Sons Ltd.	£25,954

The resignation of Fredric John Dixon as Engineer in Chief was accepted to take affect on 30th of June 1944, as from 1st July 1944, Mr.Dixon was retained as Consulting Engineer.

CHAPTER 5

1944 - 1989

New Chairman and New Engineer in Chief.

Robert Arthur Robertson, was appointed Engineer in Chief as from 1st July 1944, at a salary of £2,000 per year, at the same time Mr. R.H. Taylor was appointed Deputy Engineer in Chief.

In September 1945, H.K. Beale intimated his intention to retire from the Chairmanship of the Company at the end of that current year, having held that office for thirty and a half years. He continued as a Director, the Board recorded that, "By the constant devotion of his extensive legal knowledge, mature experience and sound judgement to the Company's affairs, he has pre-eminently contributed to its successful development and outstanding reputation".

In 1946 Mr. A.H. S. Waters was elected Chairman of the Company.

Updating of the Waterworks Code.

The purpose of the 1945 Water Act was to put into effect in England and Wales a new water policy. The most important and vital change was contained in Section One of the Act, which placed upon the Minister of Health the duty to promote the conservation and proper use of water resources and the provision of water supplies in England and Wales and to secure, under his control and direction, the effective execution by water undertakers of a national water policy. Section Two set up a Central Advisory Water Committee to advise the Minister upon matters connected with the conservation and use of water resources. Under the Third Schedule of the Act, the century old waterworks code was completely overhauled to meet the needs of modern society. This also placed on water undertakings the responsibility for repairing service pipes in streets as well as providing an adequate supply as regards sufficiency and purity. The Minister of Health was given wide powers to make orders regarding new works and land and water acquisitions. Water undertakings, under previous law, had to obtain Provisional Orders, a more costly exercise. Other items covered included, setting limits of supply and the giving and taking of bulk supplies and the amalgamation of water undertakings. In the case of water companies the Act defined levels of profits, dividends and capital.

Communication system installed.

The V.H.F. radio equipment installed for the Company by the G.C.E. Co. Ltd. on May 10th. 1949, was one of the first permanent radio equipment systems used by a waterworks in Great Britain. This equipment consisted of one fixed Headquarters Station installed at Walsall Office in Bridgeman Street, and one mobile unit in a van which also incorporated a public address system operated through the transmitter. An aerial was mounted on a 40ft. wooden mast on a side wall of the two storey building. Clear communication was obtained in an area up to ten miles radius of Walsall, beyond this distance some blind spots and dead areas were found due to the undulating terrain.

An update of this system came about in October 1963, when authority was given for the purchase of twenty new type Pye mobile radio sets to replace the original five sets which had become obsolescent on account of the obligatory conversion to the new 25 kc/s wave band which became effective in June 1964, the total cost of the sets and installation being £2,950. This equipment proved invaluable as a general means of communication between the Depots and the workforce and it was recommended that additional sets be purchased and allocated to supervisory staff working at the depots and sub-depots and to watermen working in remote areas. The need for good communications was evident as the Company's area of supply at that time comprised of nearly 500 square miles and was operated from five depots and six sub-depots. There were 79 district watermen, 44 waste inspectors and in a normal day 38 scattered gangs of varying strengths, engaged in all types of maintenance or repair work throughout this area, the total number of personnel so engaged, excluding depot staff being 330.

Supply from the Elan Aqueduct to Hayley Green.

In 1949, Birmingham Corporation Water Department afforded the Company a bulk supply of raw water from the Elan Aqueduct at a point where the aqueduct crosses the south western extremity of the Company's statutory area of supply, at Hayley Green, Halesowen.

The Ministry of Health, sanctioned an immediate start on the works at Hayley Green, designed for the pumping and treatment of this water. These works comprised of (A) Temporary Works, (B) Purification Works, (C) Service Reservoir and (D) a twenty four inch diameter cast iron trunk main.

The construction of the temporary works, commenced in the early Spring of 1949, and consisted of an eighteen inch diameter connection to the Elan Aqueduct, plus a twenty four inch diameter cast iron gravity main leading from there to the purification works. This portion of the temporary works formed part of the permanent works. A nine inch diameter branch main delivered raw water to a sectional steel contact tank of 52,000 gallons capacity. Raw water was then chlorinated at the inlet to this tank and provisions were made for de-chlorination with sulphur dioxide at the outlet. From the outlet of the contact tank the water was pumped through a main to a storage tank situated some distance up the hillside from where it gravitated into supply. Contractors for the permanent purification works were Thomas Lowe and Sons Ltd. and the works consisted of a gauging basin, contact tank and four rapid gravity filters, all constructed in re-inforced concrete. A small chemical house and two cottages were also included in the contract.

The covered service reservoir, had a capacity of one million gallons, with a top water level of 743.00 A.O.D. The construction of the reservoir in 1949 was a departure from the Company's usual practice. The maximum depth of water is 15 feet, the floor sloped from a central section up to the mass concrete walls where the depth was only 10 feet.

The columns and roof beams were pre-cast on the site and after erection, arched Hy-rib sheeting was placed in between the beams and the roof cast. Shuttering for the reservoir roof was thus entirely eliminated. Contractors for the reservoir was Messrs. R.G. Horton (Engineers) Ltd.

Messrs. R.M. Douglas (Contractors) Ltd. laid the twenty four inch diameter spun iron main, from Hayley Green to Halesowen and Blackheath which was cross connected at intervals into the distribution system. All the pipework had been lined internally with concrete as a protection against the more corrosive soft waters from the Elan Valley. Pumping plant at the station consists of two horizontal electrically powered pumps plus a standby petrol powered pump. The two stage pump and the 85 BHP three phase induction motor which drives it, were both manufactured by Mather & Platt. The single stage Sulzer pump is powered by a Laurence Scott & Electromotors 100 BHP three phase induction motor. Covering an area of two and a half hectares, the site contains reservoir, treatment works and a pumping station.

A second reservoir at Barr Beacon.

Prior to the war, in 1938, an application had been made to the Ministry of Health for the necessary sanctions to proceed with the construction of Barr Beacon Reservoir No. 2, at an estimated cost of £100,000. Permission was sought from the Beacon Trustees for the construction of the reservoir on the north side of the existing reservoir at Barr Beacon, and the engineer was instructed to make new provisions in a Bill to be presented to Parliament during the 1938/39 session. The No. 2 reservoir was not completed until 1950, the contractors, Messrs. Shellabear, Price Contractors Limited, experienced great difficulty in obtaining local labour for the construction work. Use of imported labour, principally from South Wales, increased costs by £3,185. Barr Beacon No. 2 Reservoir consists of a combination of a normal reinforced concrete design with the addition of a structural steel rigid frame, cast into concrete. It was divided into two compartments to facilitate cleaning and maintenance, with baffle walls to encourage circulation. The design of the works was similar to others built for the Company before World War Two. The valve house at the front of the reservoir contained the inlet and outlet control valves, cross connection pipework and water level indicators. Equipment for the Company's main radio station was installed in the control house together with the West Midland Police equipment. The whole reservoir measures 318 feet by 202 feet and the depth of the water was 25 feet, it has a capacity of 10,000,000 gallons.

The River Blithe Scheme.

The Company's increasing requirements for water were met by the construction of the River Blythe Scheme. The capacity of Blithfield Reservoir is 4,000 million gallons, and when at its maximum depth, its surface area totals 790 acres. In all, 2,350 acres of land were bought, 1,585 of which were purchased from Lord Baggot. Included in this considerable area were six farms, of which much of the farmland was inundated by rising waters of the reservoir.

1,100 acres of land on the perimeter of the reservoir, were for agricultural use, giving the Company control of farming operations with a view to reducing the risk of pollution. The dominant feature of the reservoir is an embankment 2,810 feet long, extending across the valley and holding back the river water. Maximum height of the embankment is fifty two feet six inches, with a top width of fourteen feet six inches containing 546,000 cubic yards of material. The valve shaft, the overflow or spillway and the discharge tunnel were designed as a single unit, a feature which was unique in this country, a massive structure of reinforced concrete.

Accommodated in the discharge tunnel were, two thirty three inch diameter mains, so arranged that either can deal with the water for supply, for compensation or for scouring purposes. At the downstream end of the tunnel is the control house, which is the nerve centre of the whole undertaking, containing the regulating valves which control the amount of water discharged to the tailbay for scouring and compensation purposes and the control of the automatic control closing valves on the supply mains. The overflow work consisted of a reinforced concrete U-shaped channel, twenty feet wide, built on top of the discharge tunnel and passing through the embankment. Upstream of the embankment the tops of the side walls of the channel, form the reservoirs overflow sills. At the upstream end of the overflow channel is the valve shaft housing the draw-off pipework and valves. Downstream of the embankment this channel passes over the roof of the control house and discharges into a large stilling pool. The water is returned to the River Blithe by a thirty feet wide water course, its mass concrete sides and invert, containing a standing wave flume, to measure the compensation and the flood water.

Though Blithfield Reservoir contains nothing so dramatic as a submerged village, its waters have enveloped a road and two buildings. The lost road, was a section between Abbots Bromley and Rugeley, which crossed the Blithe Valley. To divert this road round the perimeter of the reservoir, would have necessitated a lengthy detour which was not acceptable to the local authority, so the road was taken across its half mile width on a raised embankment, which carries the traffic, well above the top water level. A new highway, more than 900 yards long, straddles the earth embankment with a maximum height of thirty five feet and has a five span reinforced concrete bridge at the centre. The water faces are protected against wave action by mass concrete sheeting cast in situ. Other road diversion work carried out was the construction of 770 yards of concrete road to replace an access roadway (known prophetically as Watery Lane).

The only buildings submerged in the reservoir were a small but picturesque shooting lodge and a water mill. A farm had to be abandoned and re-sited, owing to its proximity to the reservoir. Preparation of the valley, which was to form the bed of the reservoir, involved the clearing of all hedges and undergrowth, which was grubbed up and burned on site. Marsh land was drained to provide a firm bed, all trees were removed after felling and tree stumps that would be less than twenty feet from the surface were treated with injections of sodium chlorate to prevent regrowth. Altogether, fifty five acres of woodland and scrub, comprising approximately 11,000 trees, were dealt with, together with seven miles of hedgerow.

Work on the main reservoir contract commenced in the autumn of 1947. In order to attract labour, a camp capable of housing one hundred and thirty men was constructed on the site. This camp was occupied largely by Irish labour.

Roughly one third of the total labour force was drawn from a unit of the Polish Resettlement Corps which was billeted in a camp within a few miles of the site. The Government's decision to form a Polish Resettlement Corps was essentially a transitional arrangement to help those members of the Polish Armed Forces, under British Command, who felt unable to return to Poland, or resettle in civil life in Britain or in other countries. Thus the Corps, set up to bridge the gap between the Poles' service with the British Forces and their settlement in civilian life on demobilisation, would cease to exist when resettlement was completed. Many were content to remain in Britain. Members of the Corps were regarded as service personnel, subject to military supervision and discipline, drawing their normal Army pay and not entitled to any payment from the Company, who paid the Military Authorities an appropriate agreed civil rate for the work. In order to attract labour, coaches were also run daily from the Potteries and from Lichfield, Rugeley and Cannock Chase areas to convey men to and from the site. The maximum labour force on site was four hundred and ninety five men.

The construction of the Admaston Road Diversion did not begin until June 1950 and the maximum number of workers on this part of the contract was one hundred and ninety. Work was virtually completed by June 1952, except for the parapet walls and construction of these was deferred to allow for proper consolidation of the embankment.

Locomotive cranes travelling alongside the trench, were the principal means of handling the trench excavation of the cut-off concrete wall in the main embankment. Material used for the embankment was conveyed by a fleet of five to ten ton tipping lorries. These vehicles helped to make the packing of the material satisfactory, the process being completed by bulldozers and vibratory rollers. Road vehicles provided the whole of the site transport, using temporary roads constructed from the claypit, the gravel lagoons and the sand and gravel plant.

Some idea of the scope of the operations can be measured by the list of plant used by the contractors. At the height of activity this included three derricks, five to ten ton capacity with jibs 100 to 150 feet in length; twenty locomotive cranes, three to seven ton capacity; fourteen dragline excavators; fourteen bulldozers; eighteen tractors and scrapers; ninety-seven assorted trucks; twenty four pumps; five compressors; and nine concrete mixers.

In the reservoir and road diversion schemes, 112,390 cubic yards of concrete were used, together with 27,000 tons of cement, 1,765 tons of steel and 530 standards of timber.

The River Blithe scheme was promoted, in its early stages, by F.J. Dixon assisted by E.W. Dixon M.I.C.E., a consulting engineer, and was completed under the direction of R.A. Robertson. The trial boreholes on site were carried out by C. Isler and Company in November and December 1937, November 1946 and February 1947.

With the construction of the project, the principal contractors, John Mowlem and Company Limited added two further successful major projects to their civil engineering achievements. Messrs. G.H. Hill and Sons of Manchester were the Consulting Engineers appointed by the South Staffordshire Waterworks Company. Mr. H. Prescott Hill was principally responsible for designing the work. The resident engineer was Mr. A.R.C. Ball who was found shot through the neck in his site office in June 1953. A verdict of accidental death was returned at the inquest. The cost of the reservoir was £750,000, twice as much as the scheme suggested by Engineer, William Vawdry in 1892.

In 1953, with the completion of the River Blithe scheme, the resources available to the Company were increased by fifteen million gallons per day, giving a substantial surplus of water available for supply purposes for the first time since 1939. It was clear, however, that with the total consumption increasing at an average rate of one and a half to two million gallons per day each year, this surplus would soon be absorbed unless the development of new sources continued. With this in mind, new pumping stations were planned at Churchill and Hagley and permanent powers were obtained to continue the use of Nethertown Intake to maintain the total supply of fifteen million gallons per day from the River Blithe.

Her Majesty the Queen Mother officially opened the Blithfield Reservoir on 27th October 1953, setting the seal on the centenary celebrations of the Company. Grey skies and a cold wind were no deterrent to the enthusiastic welcome given to Her Majesty Queen Elizabeth the Queen Mother during her visit. At 10.10 a.m., the royal train, which had remained overnight in sidings at Newport, Shropshire, pulled into Rugeley Trent Valley Station. As she alighted from the train, Her Majesty was received by the Lord Lieutenant of Staffordshire, Mr. B. Wallace-Copeland and presentations were made by many of the local dignitaries assembled on a specially decorated station platform. Assembled in the station courtyard was a Guard of Honour provided by the 6th North Staffordshire Regiment, comprising of men drawn from Rugeley, Lichfield, Burton-on-Trent and Tamworth. Among those on parade was the Regimental Mascot, Sergeant Watchman, a Staffordshire bull terrier. On approaching the dog, the Queen Mother extended her hand in a friendly fashion which caused the mascot to wag his tail in an appreciative manner. Her Majesty was then driven to Blithfield, via Abbots Bromley, where the crowded streets were bedecked with flags and bunting.

On arrival at the site, the Queen Mother alighted from the Daimler car to see her personal standard broken at the masthead. After the National Anthem had been played, Her Majesty took up her position on the dais where the presentations began, the Lord Lieutenant of the County introducing the Chairman of the Company, Major A.S. Waters V.C., and Mrs. Waters. A special cheer was given to Valerie Taylor, daughter of the Deputy Engineer, R.H. Taylor, who presented Her Majesty with a bouquet of red and white roses. Major Waters then presented former Chairman, H.K. Beale (1915-1945), Messrs. P.V.W. Gell, C.E. Hickman, G. Alan Thompson and J.C. Burman (Directors), R.A. Robertson, Engineer in Chief, H. Kirk, Secretary, and several others.

The Chairman welcomed Her Majesty, saying, "Your Majesty will not need to be assured in words of the devotion with which Your Majesty is welcomed here today which is to us, not only an important, but a happy occasion".

Responding to his address of welcome, the Queen Mother said, "I am happy to come here today to inaugurate the completion of work of the highest social importance. What we see today represents the result of far seeing planning, infinite calculation and great engineering skill, all directed to a common purpose over many patient years. When considering a great undertaking such as this, we may tend to think in sadness of the green fields that are lost to us. Few, however, can doubt the benefits that will flow from the Blithfield Reservoir to justify this."

After referring to the past history of the water supply in the district Her Majesty said, "I have much pleasure in declaring the Blithfield Reservoir open". The Queen Mother gently pulled a chromium plated lever, there was a few seconds pause before the electrical relays took effect and the faint but growing sound of rushing water was heard as two of the valves were opened to release water into the stilling pool.

Following a short inspection of the works, a commemorative plaque was unveiled. Further presentations were made to Her Majesty, including selected Company employees, representing a wide section of trades. The ceremony was watched by an estimated crowd of 8,000 who had come by coach, car and train from all parts of the Midlands. The official ceremony was closed by the presentation to the Queen Mother of an eighteenth century pearwood, ormolu mounted bracket clock, made by Robert Henderson, who was established in the Strand, London in 1772 and was renowned for his craftsmanship. The party then left the reservoir site for a luncheon at nearby Blithfield Hall.

Sir Arnold Waters as a holder of the Victoria Cross, was present at the parade of such holders which was held in London in 1956 and which was reviewed by Her Majesty The Queen. At the Garden Party which was held after the parade, Her Majesty The Queen Mother, in conversation with Sir Arnold, recalled with obvious pleasure her day at Blithfield in 1953 and enquired whether the reservoir was doing all that the Company hoped it would do.

The Blithe Valley Sewage Scheme.

The official opening of the Blithe Valley Sewerage and Sewage Purification Scheme took place at a Sewage Purification Works, near Checkley, on 16th June 1954. The opening ceremony was carried out by the Chairman of the South Staffordshire Waterworks Company, A.H.S. Waters.

Of equal importance to the provision of adequate and good water supplies is to have a drainage system for the removal of that water after being used either for domestic or industrial use. In order to remove impurities, to permit the discharge of effluents of a standard which safeguards rivers it is essential to have efficient sewage purification plant.

Construction of these works often created a financial burden on the Local Authorities concerned and left an impossible task for water undertakings wishing to extract water from the river. The Blithe Valley Main Drainage Scheme and the construction of the Blithfield Reservoir is a first class example of co-operation between those responsible for water supply and the purification of sewage.

Between 1922 and 1939, the area within the watershed of the River Blithe, downstream as far as Cresswell, rapidly developed. Some concern was shown by the authorities in being able to provide additional sewage facilities and sewage purification capacity. In September 1937, a Joint Committee from the three authorities, the City of Stoke on Trent, the Cheadle Rural District and the Stone Rural District was formed to consider sewage proposals in the Blithe Valley watershed and the provision of additional sewage purification plant. About this time, the Joint Committee was informed of the South Staffordshire Waterworks Company's proposal to develop a source of supply from the River Blithe. When the Company obtained Parliamentary Powers, in 1939, to take a supply of water from the river and to construct, amongst other works, the impounding reservoir in the parishes of Abbots Bromley, namely Blithfield Reservoir, agreement was reached between the three authorities and the Company to an extension of the Blithe Valley trunk sewer through the ridge to the valley of the River Tean and the construction of a sewage purification works at Deadmans Green in the Uttoxeter district. In consideration of the arrangement the Company agreed to contribute ú80,000, later increased to £130,000, towards the cost of the Scheme.

Completion of development at Seedy Mill.

Construction of the Seedy Mill Treatment Works and Pumping Station, which began in 1943, was carried out in four stages, and although pumping commenced in January 1947, the works were not completed until 1956. On completion, the plant was capable of treating fifteen million gallons per day and consisted of four accentriflocs, twenty four rapid gravity filters, filtered water storage tanks, chemical house, pump house and a sludge treatment works.

Raw water from Blithfield Reservoir was fed to the accentriflocs, either direct from the thirty six inch and thirty three inch diameter trunk mains, or via Hanch Reservoir. In the latter case, the water was pumped from Hanch Reservoir by low lift raw water pumps installed in the main pump house and these pumps were also used to maintain the required flow from Blithfield Reservoir, when the water level was low. Each accentrifloc with a capacity of three and three quarter m.g.d., functions as a sedimentation tank in which chemical mixing and circulation were assisted by mechanical stirring. The normal chemical used for coagulation was aluminium sulphate, but at times it was necessary to carry out lime softening in order to assist the treatment process. The filtration plant consisted of twenty four reinforced concrete rapid gravity units, each 25 feet x 15 feet x 10 feet 6 inches deep. The filter media consisted of Leighton Buzzard sand, superimposed on graded gravel, with the rate of filtering being individually controlled.

A compressed air scour and an upward flow of filtered water were used to clean the filters. Water for this purpose was derived from a 50,000 gallon reinforced concrete tank on the roof of the control gallery.

Filtered water gravitated to the treated water suction tanks below the filters and thence to the suction tank in front of the main pump house. In addition to the raw water pumps, the pump house contained the booster pumps which drew water from the treated water suction tank and pump to Barr Beacon and Gentleshaw Reservoirs, through thirty six inch and twenty one inch diameter mains respectively. A third outlet of treated water was through an 18 inch main to the Burton on Trent system. The five vertical spindle raw water pumps are each of 45 h.p. with a maximum capacity of three and a half m.g.d. against a head of 660 feet. The six horizontal booster pumps were each 700 h.p. with a maximum capacity of three and a half m.g.d. against a head of 660 feet.

Development at Churchill and Hagley.

The site chosen for Churchill Pumping Station was in delightful open country mid way between Stourbridge and Kidderminster and about two miles east of Kinver. Authorisation for the station was granted under the South Staffordshire (Churchill Pumping Station) Order 1951.

Professor Boulton in his report on the site, considered it sufficiently distant from the Whittington Sewage Works and from the Cookley Pumping Station of the Kidderminster Rural District Council, as to be in any way affected. Stourbridge & District Water Board and East Worcestershire Waterworks Company were interested in sites in the same locality, but mutual interference was unlikely. Kidderminster Rural District Council and Worcestershire County Council lodged objections with the Ministry of Local Government and Planning but these were overruled.

Permission to start work on the site was finally received in June 1951, when an access road was constructed by R.M. Douglas and Company. The well boring was carried out by Messrs. George Stowe Limited. A trial borehole was sunk to a depth of 795 feet, and when tested, realised a yield of one and a half million gallons a day, from a water level of 300 feet below ground, this was disappointing both in quantity and level. Various suggestions for improvements were made, including explosive charges, which it was suggested might be used to join the two boreholes together below ground. With this solution in mind, the contractors were allowed to charge explosives in a nearby quarry to prove the point. The result was a very damp squib. Finally, it was decided to bore No. 2 hole to a greater depth. By boring a further 150 feet, extending the borehole to a depth of 992 feet, two and a quarter million gallons a day was obtained with a water level of 260 feet below ground level.

Carrying out the pumping tests, although appearing a simple operation, involved co-operation between a great number of people.

Temporary pumps were lowered into the hole. No mains electricity was available on site, the deficiency was overcome by the use of two mobile generators, one supplied by the contractors and one by the Company. The generators were kept running twenty four hours per day for the duration of the tests, thirteen days in all. A breakdown of the plant would have ruined the operation.

Disposal of the test water pumped posed a problem, as the nearest stream was the River Stour, two miles distant. A water course was provided and patrolled throughout the test to observe that no miniature Lynmouth disaster occurred. Throughout the test, water levels were measured at the boreholes and at adjacent private wells in the district to see the effect, if any, upon ground water levels. Emergency supplies were made available in the event of these wells becoming dried out.

In all, four groups of people were employed night and day; generator operators, brook walkers, observers for well measuring and recording flow, and water level personnel.

On completion, the authorised yield was 2.2 million gallons per day, of which a maximum quantity of 0.2 million gallons was reserved for Kidderminster Rural District Council, supplied via a six inch asbestos main from the site to Axborough Reservoir.

The two boreholes were 990 feet and 1,050 feet deep respectively, the geological formation being bunter sandstone. The top 100 feet of the main boreholes were lined with 40 inch diameter solid lining tubes, grouted in situ. Between 100 feet and 450 feet the boreholes were lined with 36 inch diameter slotted mild steel lining tubes. The borehole pumps, placed 450 feet below engine house floor level, were six stage vertical spindle pumps with rubber intermediate bearings, driven by variable speed motors.

Borehole water was discharged into a suction tank beneath the engine house floor and pumped into supply by six stage vertical spindle booster pumps in duplicate, driven by variable speed motors. Water was sterilised by the addition of chlorine. The pumps were supplied by Sultzter Brothers of London Limited. Suppliers of the borehole and booster pump motors were Laurence Scott Electromotors Limited. Output from the station was pumped through an eighteen inch main enlarging to a twenty four inch main at Hagley and thence to the Company's Hayley Green Service Reservoir, the length of main being five and a quarter miles. Messrs A.H. Guest of Stourbridge were the main contractors for the construction of the pumping station, which was brought into service in March 1955.

Following consultation with the Company's Consulting Geologist, Mr. Edgar Morton, further development of the trias formation south of Stourbridge was recommended in 1953. The site chosen for development was an underground source near Hagley Railway Station in close proximity to the existing Churchill to Hayley Green Main, and an application was made for the necessary Order.

Objections against the Order were lodged by, The Upper Stour Valley Main Sewage Board, Dudley Corporation and Brierley Hill Council. In all three cases the objectors made reference to their extensive sewage farms in the Stour Valley. At a public inquiry into the Order the only objection remaining was that of the Upper Stour Valley Main Sewage Board, when a decision of the Minister was requested.

The Minister of Housing and Local Government made the Order on 14th December 1956 which did not contain a Protective Clause for the sewage authorities. A start was made on the work immediately after the Christmas holidays as the Board had already accepted contracts in respect of the works.

George Stowe and Company Ltd. of Slough was the contractor appointed to sink the four boreholes distributed around the site perimeter, each borehole was sunk 1,000 feet deep and were 24 inch diameter lined solid for the first 150 feet and for the next 300 feet with 21 inch diameter slotted lining tubes. Between 450 feet and 750 feet they were 18 inch diameter unlined and below 750 feet they were 15 inch diameter unlined. The borehole pumps, supplied by Sultzer Bros. London Ltd., were submersible pumping units driven by constant speed squirrel cage electric motors and placed 450 feet below engine house floor level. Borehole water, discharged into a 80,000 gallon capacity concrete suction tank prior to being boosted to Hayley Green Service Reservoir.

Hagley Pumping Station was brought into commission in 1959 with an authorised yield of two million gallons a day. The works, covering an area of two and a half acres, were constructed by W.J. Whittall and Son Ltd. of Birmingham, at a cost £161,510.

Booster stations.

Langley Booster Station was brought into service in 1957 and boosted water into the Warley Tower Zone which supplied the higher parts of Bearwood, Smethwick and Quinton, the residual water pumped, maintaining the water level in Warley Tower. The Sultzer Bros. (London) booster pumps, two in number, each has a capacity of two million gallons per day. Normally only one pump is used, the other being a standby. Water is drawn from Langley Reservoir.

Other booster stations brought into service during the 1950s included;

1950; Burnaston Booster Station, situated at Egginton, Derbyshire, boosting water from Findern Booster to the Burnaston Area by means of two Sultzer horizontal booster pumps.

1954; Bramshall Booster Station, situated at Bramshall Road, Bramshall, Nr. Uttoxeter, boosting water from Bramshall Reservoir to Overpark Reservoir. Two Worthington Simpson horizontal booster pumps were installed in the unit situated at the rear of the Bramshall Reservoir.

1955; Smethwick Booster Station, Victoria Avenue, Smethwick, water from Shavers End Reservoir being boosted to Cape Hill, Smethwick areas. Three Sultz Horizontal pumps were in use.

1957; Anslow Booster Station, situated at Anslow Gate, Burton on Trent, boosting water from Outwoods Reservoir to Hanbury Tower. The Sultz pump was installed in an underground pressure vessel.

1958; Booster Station at Saxon Street, Stapenhill, Burton on Trent, where two Harland Booster pumps, boosted water from Outwoods Reservoir to Winhill Tower.

1959; Findern Booster Station, situated at Burton Road, Findern, houses two Sultz horizontal booster pumps, a supply was afforded to Burnaston and Findern areas, the source of supply being a bulk supply from the South Derbyshire Water Board.

Railway siding at Wood Green disused.

A private railway siding, laid down in 1870 at Wood Green, for coal deliveries, was removed at the Company's request in 1957. Space at the station was very limited and agreement was reached with the British Transport Commission to use the plot of land for storing plant and pipework.

Scouting event at Sutton Coldfield.

The Boy Scouts Association Jubilee Jamboree was held at Sutton Park, Sutton Coldfield, from the 1st to the 12th of August 1957. The event marked the centenary of the birth of the scouting movements founder Lord Baden Powell of Gilwell and the 25th anniversary of its founding. In all over 33,500 persons participated in the event, arriving from eighty three different countries. His Royal Highness the Duke of Gloucester performed the opening ceremony and the Jamboree was visited by Her Majesty the Queen and Prince Phillip.

Naturally the occasion involved the Company in addition work in providing a water supply to the camp, the estimated daily consumption being half a million gallons. The installation of the water mains to serve the camp started in February. In all nearly 11,000 yards of main from three inch to nine inch diameter was installed, by gangs, from Sutton to Walsall, most of the pipework being laid on top of the ground and anchored by stakes and ropes. Ten water towers loaned by the War Office and having a combined capacity of 250,000 gallons were erected by contractors Sir Alfred McAlpine and Sons.

The Company's stand at the Exhibition, depicted, by means of an illustrated map and photographs, the sources of supply to Sutton Coldfield, and a special point was made to indicate the mains network for supplying the Jamboree site. Photographs of the Company's pumping stations and pictures of Blithfield Reservoir during its construction were on display.

There was also a model of Hanbury Tower and of course the "Magic Tap", the latter caused very great amusement to all the visitors. Everyone stared in wonder at the tap and were keen to learn the secret. A party of French scouts stood for quite a while and came to the conclusion that water was not running from the tap at all. On being assured that it was, one scout walked round the Exhibition Tent three times shouting at the top of his voice, "C'est impossible! C'est impossible, much to everyone's amusement.

Resignation of Chairman and Engineer.

Sir Arnold Waters., V.C. resigned from the Chairmanship of the Company and from the Board of Directors in June 1959. Sir Arnold had been a Director for eighteen years and for thirteen of these he had been Chairman. He was described as a man of many letters with thirty five after his name which were V.C., C.B.E., D.S.O., M.C., D.L., J.P., F.I.C.E., F.I.M.E., P.P.I.S.E., M.I.W.E., and F.G.S.

He was a distinguished civil engineer who was born in Plymouth in September 1886 son of a Methodist Minister and educated at Hoe Grammar School. During the First World War, he served in the Royal Engineers and gained his V.C. after personally supervising the bridging of the Oise-Sambre Canal during the Allied advance in Flanders, eight days prior to the Armistice. When requested by an interviewer for details, Sir Arnold's reply was, "Some people get much more than they deserve and I have always been one of them". Sir Arnold was also Chairman and Managing Director of Tube Investments Ltd. His wide experience and intimate knowledge of all aspects of Civil Engineering proved to be of immense advantage to the Company during a period of rapid and unprecedented expansion. For the great interest which he took in staff and work people alike, he was held in great esteem throughout the whole of the Company's organisation. He died on the 22nd January 1981 at the age of 94 years.

Mr J.C. Burman J.P. who had been a Director of the Company for eleven years was appointed by the Directors to succeed Sir Arnold Waters as Chairman.

The Engineer in Chief, R.A. Robertson B.Sc. M.I.C.E. retired from the Company's service on 31st December 1959, and the Directors expressed to him their appreciation of the loyal service he rendered to the Company over a period of thirty eight years, fifteen of which were as Engineer in Chief.

Randall H. Taylor B.Sc. M.I.C.E., who had been with the Company for twenty three years, fifteen of which he was Deputy Engineer, was appointed to Engineer in Chief.

The River Severn Scheme.

Despite the additional works on the south side of the area at Churchill and Hagley, it was evident by 1958 that a new source of some magnitude would be needed to meet future demands. It had been appreciated for some time that very little more water could be obtained by developing new sources in the underground sandstone formations in or adjacent to the area of supply, which were then yielding nearly two thirds of the Company's total requirements.

Other possible sources which were examined included the River Trent and its tributaries, the River Severn and the use of abandoned pit shafts and mine workings which were to be found in the South Staffordshire and Cannock Chase areas. It was soon apparent, however, that the only suitable source of any magnitude was the River Severn, which flows within seven miles of the western boundary of the Company's area of supply and was only twelve miles from Shavers End Reservoir. Sampling of the River Severn had been carried out regularly since 1955 and the results indicated a water of reasonable quality which could be easily treated to make it suitable for public water supply purposes.

For a number of years the maintenance of an adequate minimum flow in the River Severn had been a matter of concern to the Severn River Board and others interested in the river. Applications to abstract more water from the source were opposed by users of the river water because of the limited dry weather discharges. In 1958, the Company opposed an application made by the Cheltenham and Gloucester Joint Water Board for an order to authorise them to increase their abstraction from the Severn at Tewksbury by eight million gallons a day. The Company objected on the grounds that there were likely to be considerable demands upon the river by themselves and others for water supplies, and that only the minimum immediate requirements of the Cheltenham and Gloucester Joint Water Board should be allowed without some form of river conservation and pending a full review of the whole position. The Company submitted that future abstractions should be related to a master plan which took into account the conditions in the whole river basin that would enable equitable terms to be agreed for all existing and prospective abstractors. As a result of the objection the Ministry accepted the Company's contention in general terms by allowing a reduced abstraction of three million gallons a day pending a review of the whole position. A similar objection to a Draft Order submitted by Coventry Corporation in 1959, resulted in a request for an abstraction of ten million gallons a day being reduced to three million gallons a day.

In January 1959, a meeting was called by the Minister of Housing and Local Government of all authorities known to be interested in taking water from the River Severn and as a result of the meeting the Minister agreed to prepare a hydrological survey of the river, setting out its resources, the likely demands upon it, the way the demands could be met and the character of any works required for water supply and flood control. This hydrological survey was published in 1960 and set out the results of a very full and comprehensive examination of the rainfall, river flows, geology and existing water use within the Severn Basin, including direct abstractions from the river, from boreholes and usage for purposes of land irrigation.

The survey recommended the provision of regulating reservoirs in the headwaters of the river to be developed and financed on a co-operative basis between the abstracting authorities in the interests of all river users. The survey showed that new abstractions of a total of two hundred and fifty million gallons a day could be made available in the Severn Basin for water supply purposes, if all the suitable sites for regulating reservoirs in the head waters of the river were developed and used.

Following the publication of the hydrological survey, the River Severn Water Resources Committee was set up by the Minister, consisting of representatives of interested parties desirous of taking new or increased abstractions from the River Severn. Among the items considered were the powers needed and possible methods of financing a scheme. A report entitled "The Water Resources of Wales" was published in 1961. This classified all possible reservoir sites into various degrees of suitability. The most promising site in the Severn Basin was located at Clywedog where a reservoir of some 11,000 million gallons capacity could be constructed which would be capable of both sustaining a minimum flow of one hundred and sixty million gallons at Bewdley, the minimum flow recommended in the survey, and allowing additional abstractions to be made at various points on the river by the statutory water undertakings represented on the Working Party.

Sir William Halcrow and Partners were appointed to undertake site surveys and geological investigations so as to report on three possible dam sites in the Clywedog area. The recommendation made to the Working Party was that the most economic arrangement of a dam or dams to provide the prescribed storage volume was a single dam in the Bryntail Gorge where a thick band of rock crossed the valley. For economy and speed of construction a dam of the round head concrete buttress type was suggested.

The Working Party accepted the reports and after somewhat prolonged discussions as to the basis upon which the cost of such a project could be divided amongst the participating authorities, agreement was reached.

For the purpose of preparing a Bill in Parliament a new Joint Committee of Promoters was formed with substantially the same authorities as members. The constituent members of the Clywedog Reservoir Joint Authority, which came into being on 25th September 1963, were the Corporations of Birmingham, Coventry, Shrewsbury, Wolverhampton and Worcester, the Central Electricity Generating Board, the Bristol, East Worcestershire and South Staffordshire Waterworks Companies, the Cheltenham and Gloucester, East Shropshire and Montgomeryshire Water Boards, the Severn River Board and Montgomeryshire County Council.

The Clywedog Reservoir Joint Authority Bill was first considered by the House of Lords, and certain aspects of the land compensation clauses were referred to a select committee as the result of a petition by the National Farmer's Union. The Bill finally received the Royal Assent in July 1963 after a somewhat delayed passage through the House of Commons.

Situated in the Bryntail Gorge, the Clywedog Dam is three miles upstream from the confluence of the Afon Clywedog with the River Severn at Llanidoes. The reservoir extends up the valley for a distance of about six miles, near to the village of Staylitttle. The spillway crest level is +927 feet above sea level (Newlyn).

The reservoir floods 615 acres of land at 927 feet, most of which is contained in the farms called Ystradynod, Eblid, Aberbiga and Gronwen. In each case the farmhouse has been submerged. Fourteen other farms are affected to a minor degree except for Crowlyn which lay in the shadow of the dam and was untenable as a farmhouse during the three year construction period.

The Clywedog Joint Authority Act came into operation in July 1963, the Company's contribution of £1,130,000 towards the cost of the project, estimated at £3,920,000, was approved by the Board of Directors in July 1963. Reed and Mallik of Salisbury were awarded the contract for the construction of the dam and the ancillary works.

Three hundred men were employed on a site which contained a quarry, stone crushing and a concrete mixing plant. Their first task was the excavation of 170,000 cubic yards of spoil to provide a foundation for the buttress faced dam, built with a concave so that it followed the line of strength giving rocks below the valley. A crane known as "Blondin" carried concrete across the dam face and dropped the contents of the skips into the huge shutters that acted as a framework for the three buttresses of the dam construction.

When the project was first planned, extremists claimed to have "seeded" the valley floor with bottles of poison, and demonstrations against the construction were supported by the Welsh Nationalist Party, (Plaid Cymru), the Free Wales Army and a splinter group known as Sons of Glyndwr. Welsh Nationalists voiced their opinion that the Welsh people had a right to receive a return for their water comparable to that which other countries received for their oil. It was also said that it was morally indefensible that rich and powerful English cities should be supported by their Government in the seizure of these Welsh resources against the interests and the will of the Welsh people. The Welsh Nationalists were blamed for sneaking into the site and blowing up a vital part of the dam site equipment in March 1966. Saboteurs blew up a thirty foot mast and brought down the aerial cableway, the explosion also blew a hole seven foot across in the rock face where the crane had been anchored, the blast rattled windows in Llanidloes six miles away. An anonymous telephone call to the police at Gwynedd, Caernarvon, gave a sixteen minute warning of the explosion. The explosive was placed to destroy the anchor of the crane. There was an eight ton bucket on the cable at the time of the blast, as the anchor gave, the bucket dragged the headmast over. The damage was condemned as a totally irresponsible and dangerous action, carried out by misguided persons.

The bitterest opponent of the contractors was not the Welsh, many welcomed the project, but the weather, especially during the winter periods. It was said that a breeze in the hills was soon transformed into a gale force gust as it funnelled down the valley, often stopping work on site when the skips of concrete were blown about in a dangerous manner.

From 1966 to 1968 the Company acted as management agents of the reservoir which responsibility then passed to Severn River Authority. The regulatory function of the Clywedog Dam was not exercised until the drought year of 1976, although work was completed on the site in 1967.

In 1960, whilst the Clywedog negotiations were proceeding, it became essential for the Company to seek powers to take a supply of water from the river by direct abstraction in order to meet the increasing demands for water. Birmingham and Wolverhampton Corporations were likewise in need of additional supplies and powers were obtained in a Joint Order, to enable each undertaking to take a supply from the River Severn prior to its regulation.

Wolverhampton Corporation approached the Company to consider the possibility of a joint scheme for abstraction from the river. In view of the advantages to both parties of such a scheme, it was eventually decided to proceed on the basis of a total rate of abstraction of thirty million gallons a day for the Company and fifteen million gallons a day for the Wolverhampton Corporation from a common intake and treatment works and a delivery pipeline to be extended to the area of supply. The Company, as initiator and major partner, would be responsible for the design, construction and operation of the works which were to be financed jointly in proportion to the respective takes.

Wolverhampton Corporation Water Undertaking started as a statutory water company in 1845 but was transferred to the corporation in 1868 and in 1960 served a population of 377,000 with a supply area of one hundred and fifty two square miles. This area included the County Borough of Wolverhampton and those parts of the County Boroughs of Walsall and Dudley not supplied by the South Staffordshire Waterworks Company. It also served parts of the Rural Districts of Cannock, Seisdon, Shifnal and Bridgnorth.

The stretch of river nearest to the area of supply was to be found at Bridgnorth and several valleys topographically suitable were considered in this area, but some were ruled out for geological reasons and others on account of past or future coal mining activities. The site finally chosen was in the valley of the Chelmarsh Brook on the west bank of the River Severn, about three quarters of a mile above the Hampton Loade Ferry.

Suitable sites for the intake and treatment works were found on the east bank of the river immediately opposite the reservoir site and near to the village of Quatt. With this arrangement, the intake, treatment works and pumping station were on the side of the river most accessible to the Company's area of supply, forming a compact unit which, should it be necessary, could abstract direct from the river without passing the water across the river into Chelmarsh Reservoir.

Civil engineering operations at the Hampton Loade works commenced with a site investigation contract at the Chelmarsh Reservoir site in 1961.

This information was extended by further investigation work carried out at Chelmarsh, the site of the river intake and at the treatment works in 1962.

Following confirmation of the Parliamentary order in March 1963, construction work began in earnest with a contract for Chelmarsh Reservoir and associated access roads, which commenced in August 1963 and this was followed by a contract for the main access roads to the intake and treatment works sites. In September 1963 the contract for the forty five inch main from Hampton Loade to Sedgley was awarded and contracts for the filters and accelerators, the chemical house and high lift pumping station, the river intake works and the road and pipe bridge followed in rapid succession.

Chelmarsh Reservoir has a surface area of eighty three acres and a capacity of 440 million gallons. The dam comprises a conventional earth embankment 2,300 feet long, having a maximum height of 95 feet, with a rolled clay core and marl and gravel shoulders.

Hampton Loade Intake Works are sited on the east bank of the River Severn, about four miles south of Bridgnorth. Normally, water flows by gravity from Chelmarsh Reservoir to the treatment plant through a sixty inch diameter outlet main and duplicate forty five inch mains laid between the Intake and Treatment Works. When the reservoir level is low, the low lift pumps housed in the Intake are used, as required, to pump water from the reservoir to the treatment plant. Should the level in Chelmarsh Reservoir fall to such an extent that it is outside the duty range of the low lift pumps, water is boosted from the reservoir to the treatment plant by the intake pumps.

A feature of the riverside works is the 150 feet span self supporting arched bridge formed by twin sixty inch diameter steel inlet and outlet mains across the river, which support a roadway connecting the works between east and west banks of the River Severn.

After filtration and sterilisation, the water is pumped through the twelve miles of forty five inch diameter main to the service reservoirs constructed at Sedgley Beacon. The forty five inch diameter bitumen lined and sheathed steel mains are jointed with Viking Johnson Couplings, as part of the route of the pipeline passes through an area which may be liable to mining subsidence. Cathodic protection has been provided for the steel pipes and a copper bonding strip has been fixed across each coupling in order to provide electrical continuity. Sluice valves have been located at approximately one mile intervals and there is provision for interconnection of the duplicate mains at approximately two mile intervals. The sluice valve and cross connection chambers also act as anchorage blocks to resist the unbalanced thrust arising from a section being emptied. A limited supply of water was made available in February 1966, the first phase being fully commissioned in December 1967, making fifteen million gallons a day available.

The site chosen for the storage reservoir was located at Sedgley Beacon Ridge which was the common boundary of the two undertakings.

Sedgley Beacon is a limestone ridge running North North West / South South East, being the most northerly spur of a hill, some two miles long by half a mile wide, which is crowned by the old village nucleus of Sedgley. The hill has maximum elevations of 750 feet A.O.D. near to Sedgley Church and 770 feet at Sedgley Beacon itself. Beacon Hill is the first natural feature viewed when travelling southwards from Wolverhampton to Dudley as you travel through Sedgley.

Outline planning permission was granted by the Coseley U.D.C. and the Sedgley U.D.C. on January 10th and January 18th 1962 respectively, for the construction of a covered reservoir subject to certain conditions including the landscape scheme. The ultimate capacity of the receptacle was forty five million gallons, thirty million gallons for the Company and, fifteen million gallons for the Corporation. The reservoir is of the conventional reinforced construction with cantilevered walls and in situ columns and roof. Built into the top of the ridge, the earth cover was replaced to resemble as closely as possible the original profile of the hill.

In November 1969, a fleet of six tractor scrapers, each capable of moving some twenty five cubic yards of material, moved on to the site. The first few months were occupied in removing the top of Sedgley Beacon down to a depth of some twenty five feet below original ground level until a level area was formed on which the reservoir was to be constructed. Altogether 80,000 cubic yards of material, mostly rock, was excavated. Sufficient was stored in a vast stock pile at one end of the Beacon to be re-used on completion of construction work to form embankments. Surplus material amounting to 20,000 cubic yards was removed from the site, a task which kept five lorries occupied for five months.

In April 1970 the first concrete was poured in the wall foundations and was followed by the pouring of the wall panels each 20 feet long by 25 feet high each requiring 40 cubic yards of concrete. Construction of the column bases and columns followed, and finally, erection of steel beams from which the roof shutters were supported, and construction of the roof slab. Concurrently with the reservoir construction, 850 yards of forty five inch and thirty six inch diameter mains, forming the reservoir, were laid, together with inlet and outlet mains to the construction of an underground cross connection chamber on the western side of the Beacon slopes.

The first phase of the work, a five million gallon compartment to be used by Wolverhampton Corporation, was tested and put into supply on 21st May 1971.

A landscaping scheme was carried out in consultation with the local planning authorities, in order to relieve the regular outline of the reservoirs on the Beacon ridge. The only evidence of their existence now is a small chamber on each side giving access to valve chambers and the reservoirs. The public is allowed access to the area occupied by the construction designated as a public open space.

Sedgley Beacon service reservoir was constructed by Tarmac Construction Ltd. at a cost of £1,007,986 and was completed in 1972.

A booster station, commissioned in 1972, at a cost of £37,760, is served by the reservoir from the outlet pipework and is situated on the eastern slope, 23 metres lower to maintain a positive pressure on the booster pumps, comprising of two Sultz horizontal single stage centrifugal pumps.

Water is received from Hampton Loade Treatment Works into both compartments via the forty five inch main of which half has now been duplicated. The water from the Company's compartment is distributed as follows;

Sedgley via Sedgley Booster, Cawney Hill and Turners Hill zone via Coneygre
Booster and by gravity to the Coseley area. Wednesbury and Darlaston,
West Bromwich and Walsall and to Cannock via Walsall Booster.

The Company's compartment of the reservoir measures 99 metres by 59 metres, with a top water level of 228.60m A.O.D., bottom water level of 220.98m A.O.D. with a water depth of 7.62 metres. Both inlet and outlet valves of the reservoir can be remotely controlled and a visual display of valve settings, flows and reservoir levels is indicated in the Control Office at Walsall.

Original railway main repaired and abandoned.

On 19th of January 1961, a serious fracture occurred on the original cast iron pumping main from Sandfields Pumping Station to Wood Green, about half a mile north of Hammerwich Station. The burst occurred at a point where the main was laid on top of the railway embankment, thirty feet high adjacent to a railway bridge. Escaping water washed away a section of the embankment near to the bridge causing a large cavity about twenty feet across and some twenty five feet deep and undermining both railway tracks and exposing the main, views of the damage were shown on television that evening. Subsequently it was discovered that a passenger train had passed over the railway line as its support was being scoured away.

Immediate action in accordance with prior arrangements, was taken to warn British Railways when the drop in pressure occurred and railway traffic was stopped without any mishap. British Railways refilled the cavity in the embankment in slightly over twenty four hours and the length of main was re-laid over the repaired section of the embankment, being slung on a forty five feet long mild steel joist, to protect it against settlement. Normal pumping was restored from Sandfields within forty eight hours of the mishap occurring. Under the terms of the agreement relating to this main, the Company was responsible to the Commission for the cost of all repairs, together with the cost of delays in traffic and alternative road services for passenger traffic. The main continued in use until 1971, it was eventually abandoned following the completion of the Seedy Mill to Barr Beacon thirty six inch main.

Development at Cookley.

Development of the scale of the River Severn scheme did of necessity take some time to complete before even a small supply was available and as an interim measure, the Company sought powers to develop an additional supply of underground water at Cookley near Kidderminster. The application was opposed by eight local authorities and seven industrial users of water in the area.

The local authorities main grounds for objections were that if the scheme were authorised, it would appropriate underground water which should be available to the proposed North West Worcestershire Water Board. Kidderminster Rural District Council and Kidderminster Borough Council objected on the grounds that their existing source would have been adversely affected at their existing Cookley Pumping Station. This source which yielded 120,000 gallons per day, was situated approximately two hundred yards from the proposed new Cookley Site and there was no doubt that the Company's pumping operations would diminish or stop the artesian flow in the Council's borehole. Under the Protective Clauses in the Order, the Company would have the option of, affording a bulk supply to Kidderminster R.D.C. in lieu of their existing supply, on terms to be negotiated, or install a more powerful new pump in the Council's borehole. The first alternative was preferred by the Company and a bulk supply was afforded.

Of the seven industrial users, who included, the British Sugar Corporation, I.C.I. Ltd. and Kidderminster Carpet Manufacturers, there were objections in relation to the possible depletion in supplies used in connection with their manufacturing industry. With regards to the industrial users objections, Mr. Edgar Morton the Company's consultant reported that he did not consider that the objections were formidable, as their sources of supply were more than two miles distant from the proposed site.

A public inquiry was held but the result was inevitable, the Minister of Housing and Local Government made an order in August 1960, authorising the Company to develop the Cookley Scheme, to assist in meeting the districts needs until the first stage of the Severn Scheme was brought into commission. An abstraction of three million gallons per day was the projected target.

Three boreholes, each 600 feet deep were distributed around the site perimeter, the geological formation being the Bunter sandstone. The dispersion of the boreholes enabled a larger area of aquifer to be exploited and the maximum yield to be secured with a minimum draw down of the water table. This layout, together with the separation of the suction tank from the main pump house, enabled work to proceed simultaneously on boreholes, suction tank and pump house, facilitating the speed of construction. The boreholes were lined for the first 100 feet with 36 inch diameter solid lining tubes and the next 200 feet with 30 inch diameter slotted lining tubes. Between 300 feet and 500 feet they are 24 inch diameter unlined and below 500 feet they are 18 inch diameter unlined. The borehole standing water level is 12 feet below engine house floor level and approximately 50 feet below, when abstracting three million gallons per day.

Sultzer Bros. of London Ltd., supplied the single stage submersible pump units driven by constant speed squirrel cage electric motors which were placed approximately 130 feet below engine house floor level. Borehole water was discharged into a 60,000 gallon capacity reinforced concrete suction tank from where it was pumped into supply by duplicate horizontal booster pumps. The water from the station was pumped to Shavers End Reservoir after sterilisation by the addition of chlorine prior to entering the suction tank.

The pumping station and cottages were designed by the Company's Consultant Architect Neville Hawkes of Messrs. Harry Bloomer and Son and the buildings were constructed by A.F.R. Godfrey and Company Ltd., of Wolverhampton. Contractors for the boreholes were Le Grand Adscro of Southall, Middlesex and the contractors for the suction tank, access roads and drainage work were R.G. Horton Ltd. of Brierley Hill. The station was brought into commission in 1962 and cost £161,900. Cookley may well be the last of the Company's large pumping stations.

A water supply to Tutbury.

The water supply undertakings of Britain are constituted either by Acts of Parliament, in the majority of cases prior to 1945, or under the Public Health legislation, or since 1945 by Orders made by the Minister of Housing and Local Government under the powers conferred on him by the Water Act of 1945. Shortly after this Act, the then Minister, formulated a policy of reorganisation of the industry which when implemented caused a reduction in the number of water undertakings from 1,174 to less than 600 and the process still continued. The exercise was carried out to form undertakings of such size as would enable the work to be carried out with greater efficiency than was possible with a multiplicity of small undertakings. The absorption of lesser undertakings started with, in the Company's case, Tutbury.

A request was received from Tutbury Rural District Council, asking if the Company would consider absorbing them under the regrouping scheme. At the time the Council was receiving a bulk supply from the Repton Rural District Council from the water they received from Derwent Valley Water Board. A further addition to the Company's area of supply occurred on the 1st April 1961 with the take-over of Tutbury Rural District Council's Undertaking, a parish lying to the north west of Burton on Trent. The area acquired was approximately one square mile with a population of 3,000. It was mainly residential and agricultural in character and comprised of about eight hundred properties with a daily consumption of 90,000 gallons.

The original scheme at Tutbury was designed to meet the requirements of 2,000 inhabitants. Tutbury Reservoir site was purchased from Sir Oswald Moseley in 1905. The reservoir was of brick construction with a capacity of 75,000 gallons and a top water level of 312 feet above sea level. A site for the pumping station was leased from a Miss Newton on a twenty year renewable lease.

The station was equipped with two Tangye three throw electric pumps hired from the East Midland Electricity Board at a rental of three pounds per quarter. These pumps were capable of raising 30,000 gallons in six hours.

The well was sunk in 1904, seven feet in diameter and thirty feet deep. Water rose to a height of fifteen feet above the bottom of the well and was tested without intermission, night and day for fourteen days and the lowest yield was 5,120 gallons per hour, 122,000 gallons a day, enough to meet the needs of the population of 2,000. Water was delivered to the reservoir through a five inch pumping main and from there delivered by gravity to the town through a four inch distribution main. All the water from the well had to be metered and was subject to a Royalty of a penny (1d) per thousand gallons. In 1923 the Tutbury Rural District Council undertook to supply the parish of Hatton having a population of 1,400. Owing to the possibility of water becoming contaminated due to war activities, the Tutbury Council was instructed by the Ministry of Health to chlorinate the water and the necessary equipment was provided in 1940. At the time of take-over, the Statutory water area of the Civil Parish of Tutbury comprised of 3,875 acres.

Eleven booster stations commissioned during the 1960s.

1960; Yoxall Booster Station, Sudbury Road, Yoxall, two horizontal Sultz Bros. booster pumps supplied water from Seedy Mill Pumping Station to Marchington and Hanbury Towers. One pump was normally in use, drawing water from a 57,000 gallon suction tank.

1960; At Blythebridge Bank, Kingston, Nr. Uttoxeter, a source of supply from Brindley Bank Pumping Station was afforded to the Kingston District. A Beresford Pump was installed in a sheet steel cabinet by the roadside, and one Mather and Platt pump installed in a temporary wooden hut. A pressed steel suction tank was provided as reserve capacity to meet peak demands.

1961; Harlaston, Nr Tamworth, where one horizontal Sultz Bros. booster pump, housed in a cast iron cubicle by the roadside, boosted water from Chilcote Pumping Station to the Harlaston district.

1962; West Bromwich Booster Station, Newton Street, West Bromwich, a supply was afforded to the West Bromwich area from Barr Beacon Reservoir by means of two vertical spindle pumps, supplied by Sultz Bros., one fixed speed and one variable.

1962; Two Gates, Wilnecote, Nr. Tamworth, two vertical booster pumps supplied by Sultz Bros., supplied water from Hopwas to the Wilnecote area, this replaced the original booster of the Tamworth Water Joint Committee.

1962; Stanton Booster Station, Mayfield Reservoir, Nr Ashbourne, water from this reservoir was boosted to Stanton Reservoir by means of one of two Berry Hill horizontal fixed speed pumps.

1963; Wednesbury Booster Station, Church Hill, Wednesbury, water from the reservoir was boosted to the area by two Sultzer Bros. vertical spindle pumps.

1965; Chapel Street Booster Station, Brierley Hill, a supply was, by 1971, afforded to nine blocks of high rise flats, serving 492 units. The pump house, situated beneath the ramp to the car park, housed 3 multi-stage centrifugal pumps, made by Beresford.

1966; Tutbury, Nr Burton on Trent, two Mather and Platt lynavane booster pumps, vertical spindle with impeller built into pipeline, situated in a pit in the reservoir grounds, boosted water from the reservoir to Tutbury. As a protection against flooding, the pit had air bells fixed.

1968; Heatley Green, Nr Abbots Bromley, water from Brindley Bank Pumping Station was boosted by a Grundfoss vertical fixed speed booster pump to the Heatley Green Area.

1968; Walsall Booster Station, Moat Lane, Walsall, water from the reservoir could be boosted into either Barr Beacon, Shavers End or Gentleshaw systems as required by two horizontal Tangye fire pumps each 42,000 gallons per hour, the motors were two Ford V8 petrol engines. This was a temporary installation, in a temporary building, on Walsall Reservoir site for emergency purposes only, a new booster station was projected.

Take over of Tamworth Waterworks.

As from the 1st of July 1962 the water supply afforded by the Tamworth Waterworks Joint Committee were taken over and continued by the South Staffordshire Waterworks Company. Take over terms were accepted by the Joint Committee, on which the three local authorities of Tamworth Borough and the Tamworth and Lichfield Rural districts were represented, at their annual meeting held 27th June 1962. It called for payment by the Company to the Joint Committee of £14,000 plus the amount of loan debt incurred by the Committee at the date of transfer, £45,000 to £50,000, and the amount of stock held by the Committee, estimated at £4,000. The waterworks committee had decided to increase its water rate in January 1962 from one shilling and eight pence to two shillings and sixpence in the pound on the net annual value, but the minimum charge was reduced. The reason for the change was to bring the Tamworth water rate into line with the Company's charges.

A previous Company offer for the works had been rejected by the Committee, the new terms were referred to as gift terms. The works acquired in the take over were Hopwas Pumping Station, a traditional Victorian waterworks style building with ornate brickwork window arches and corbelling. Originally constructed in 1879, two fifty horse power engines of the beam condensing type were installed by Messrs. Gimpson and Son of Leicester.

The engines working a pair of bucket and plunger pumps were capable of an output of 18,000 gallons per hour. The normal pumping rate was 16,000 gallons per hour, the output being limited by the water level in the well. For some years one pump was sufficient to supply the needs of the district, but eventually they were worked in tandem, any repairs or maintenance had to be done during the night time period.

On the recommendation of the Engineer, in 1918, the Committee consented to a second well being developed as the daily consumption had doubled. After taking the opinion of an eminent geologist Professor Lapworth, in 1920, it was decided to sink a borehole near the station, this being the only locality in the Committee's area where a suitable quality and quantity of water was available. Work on the second well was commenced in 1923, by the British Well Boring and Engineering Company of Liverpool, and sunk by percussion method to a depth of 220 feet.

On January 11th 1924, an enquiry was held by the Ministry of Health as to the raising of a loan to install pumping plant in the borehole and install pumping plant, this had been advised by F.J. Dixon who had been acting on a consultancy basis for the Joint Committee, he also suggested that the old plant be overhauled to act as a standby.

In 1926 a Tanyge horizontal steam engine of the coupled compound type with well and double acting force pump was installed. At the same time the Cornish boilers were renewed in order to give a satisfactory steam supply to the two beam engines and the Tanyge engine. Pumping into supply continued from 1926 until February 1931, when serious discolouration made it unsuitable to pump to supply, and the plant in the second borehole stood idle until August 1933. On examination it was found that several of the lining tubes in the borehole were fractured, thus allowing marl to be drawn in during pumping operations. The Committee decided to carry out improvements in an effort to seal out the marls. A Ministry of Health Enquiry was held on 9th September 1932, when sanction for the loan was given and the work was put out to tender.

Messrs C. Isler and Company were engaged to sink a well around the borehole, on the advice of F.J. Dixon, a cement concrete plug was placed in the bottom, reducing the depth to 189 feet. Sunk in the sand and gravels of the Hopwas Breccia Group, the well was lined with 5 feet 6 inches diameter cast iron tubes to 114 feet and with 4 feet 6 inch tubes to 173 feet. Below 173 feet it was 3 feet diameter and was unlined to 189 feet. The smoke stack at the station was demolished in the late 1960s, pumping ceased in 1965.

The original Glascote Reservoir, built in 1880, held sufficient water for one and a half days supply. Constructed entirely in brickwork and totally enclosed, the roof consisted of semi-circular brick arches springing from arched traverse walls, stiffened by subsidiary flat arches spaced at 13 feet one inch centres. Dimensions of the receptacle are 32.0m. x 31.7m x 4.78m deep. Top water level is 364.6 A.O.D. Built in a mining area, close to the North Warwickshire Colliery, for some years cracks had been observed in the roof and walls of the structure which were gradually spreading, subsequently the reservoir was taken out of commission until remedial work was carried out.

It was thought that a better supply would be given to the district and it would be more cost effective, by pumping direct into the top of a reservoir near to the Hopwas Pumping Station instead of into the bottom of Glascote Reservoir, through four and a half miles of pumping main, which also served as a supply main.

Careful consideration resulted in the Committee deciding to purchase a site in Hopwas Wood, near the pumping station, at a height of 419 feet A.O.D. and to build a reinforced concrete covered reservoir of one and a half million gallons capacity.

Consulting Engineers for the project were L.G. Mouchel and Partners, after collaboration with the Joint Committee's Engineer and Manager, J.C. Radford A.I.W.E., a case was drawn up for submission to the Ministry of Health. On November 20th 1934 an enquiry was held and sanction obtained to construct the reservoir. Tenders were invited and Messrs. Hussey, Egan and Pickmere Ltd. of Birmingham, were awarded the contract. Work on site commenced in June 1935 and the structure, pipework and ancillary works finished and ready for service on 28th July 1936, leaving only the excavated ground to be replaced and banked around the reservoir.

This was the first reservoir of its type in this country in which the concrete was consolidated by the vibrated shuttering system. The walls of the reservoir are seven inches thick at the base, finishing five inches at the roof, reinforced with steel bars, one and a half to three sixteenths of an inch thick. Total weight of the steel bars in the structure is 130 tons, total weight of the concrete 2,177 tons. When the reservoir is full, the water is sixteen feet deep. Total weight of the water when the receptacle is at its maximum is 6,696 tons. The cost of the reservoir was £7,416.

The Joint Committee had over the years laid an adequate mains supply system. As development took place at Mile Oak and Wilnecote, the old twelve inch main had been found to be below capacity to meet the needs of the outlying districts, so a new twelve inch spun cast iron main was laid from Hopwas to Two Gates cross roads, a connection from this main to an existing nine inch main virtually forming a ring main. In addition a six inch main was laid from the new twelve inch main at Bonehill cross roads to Mile Oak. This scheme was completed in 1934.

As housing expansion continued the supply to Wilnecote was augmented by the installation of Booster Plant at Wilnecote the highest point of the area at 381.48 A.O.D. The Company considered the beam engines obsolete and unreliable, the Tangye engine although serviceable, was due for an extensive overhaul, it was decided to modernise the station by installing electrically operated submersible pumps, in duplicate, in the new well.

A modernisation scheme was carried out in 1963. Installed were two electrically driven submersible type centrifugal pumps rated at 31,200 gallons per hour against a head of 279 feet and driven by 55.5 h.p. fixed speed motors running at 1450 r.p.m.

The submersible pumps were supplied by Sulzer Bros.(London) Ltd. and the electric motors by Hayward-Tyler and Company Ltd. A 96 h.p. Ruston & Hornsby diesel engine driving a Crompton Parkinson alternator has been provided as a standby in the event of prolonged power failure.

The combined yield of the well is 550,000 gallons per day and the water is pumped to the Hopwas Reservoir on elevated ground behind the station from where the water gravitates into supply.

The winter of discontent.

The winter of 1962/1963 was exceptional in its severity and the Company found, in common with all public utility undertakings, that its resources were taxed to the limit. The great frost started on 25th of December 1962 and lasted till 22nd of March 1963. Thousands of frost difficulties were reported to the Company which included, six hundred and forty fractured mains, 32,400 defective fittings and burst pipes, 88 frozen Mains, 8,345 frozen service pipes, and this was probably only a quarter of the total, as many were not reported.

All available labour which could be economically utilised was engaged on main repairs, waste prevention, maintenance of emergency water supplies and restoration of frozen mains and service pipes. Twenty additional vans were hired for the quick conveyance of waste inspectors, watermen and other grades, for shutting off branch supplies and knocking up burst pipes. Frozen distribution mains were thawed out by steam jets from paraffin fired or electrically heated portable boilers and also by electrical means. Frozen service pipes were thawed out by electrical means on a priority basis, having regard to public interest or hardship. Three steam raising plants, together with nine portable electric transformers and two portable welding generators were used for thawing out. Emergency supplies were given, to the unfortunate, by means of twelve water tankers. The cost to the Company of this severe weather was considerable, not only in the extra workload, but on account of the very large and unusual consumption of water due to waste from defective pipes and fittings, during the four month period and subsequently until waste was dealt with. The highest quantity pumped in one particular day was 63.09 million gallons. Total cost to the Company was £41,500.

A water supply to Rugeley.

On the 1st of April, 1963 the Company took over the water undertaking of the Rugeley Urban District Council. The Rugeley Order had been made by the Minister of Housing and Local Government on 7th of February 1963 and came into operation a week later.

Rugeley, like other outlying small towns and villages were dependant on wells for their drinking water. Hand pumps were used to bring the water to the surface.

Residents believed the sources safe for cleaning purposes, inhabitants without their own wells, carried the water required for cooking and drinking purposes from springs and the two fountains which were placed in the town at the Market Place and Brook Square plus a public well in Sheepfair. A good supply was given to the town by a spring in Elmore Street.

Under Section 21 of the Company's Act of 1878, powers were given to the South Staffordshire Water Works Company to supply Rugeley at the instance of the Local Board. These powers had a limitation period of five years which ceased on the 23rd of July 1883. But after that time an agreement could be made to supply water in bulk under the Public Health Act of 1875, if so required.

In February 1878 the Company's agent canvassed Rugeley and reported on the conditions of the 652 houses and the method of supply to the inhabitants. He called on several members of the Local Board who were willing to take a supply of the Company's water themselves and were in favour of a supply being made available to Rugeley. The principal objection was that after the powers to supply had been obtained the Company would wait three or four years before executing their works, having only obtained the powers in order to keep other companies from supplying the town.

The nearest pumping station was three miles away and assuming an eight inch main was required plus three and half miles of distribution pipes in the streets, the cost was estimated at £3,500.

On condition that all the houses agreed to take water it was calculated that revenue from water rates would yield £650 per annum. The Company's agent said that they had little chance of attracting half the inhabitants and for this reason the directors postponed main laying pending the execution of agreements to take water sufficient to justify the requisite outlay.

R.Lander solicitor and clerk to the Rugeley Local Board was sent a letter outlining the Company's charges which were seven and a half per cent per annum on the annual value of the house up to £10, and six per cent on a house up to £20. This included a supply for one water closet, additional closets cost four shillings per annum, baths were an extra eight shillings per annum. If it was required the Company could supply in bulk and a meter would be fixed on the boundary pipe. A requisite list of houses willing to take a supply was not received.

Twelve years later Rugeley was still dependant on their wells for water, a supply from the Company was considered too expensive. In November 1890, following a Local Board Meeting, the question on every ones lips was "What has been done to further a scheme in relation to our water supply". The answer was soon told, nothing. The Medical Officer and the Surveyor had visited 799 houses in the district. Only 367 wells were found good, 78 were short of water, 72 were dry, 142 claimed no use of the well and 129 houses had no water. One of the schemes suggested by the Company was for mains to be laid to the Rugeley boundary at Sandy Lane, and for the town to provide and lay mains through the district.

Water would have been supplied through a meter and charged for, at a rate of five pence a thousand gallons, but subject to a minimum charge of fifty pounds a quarter. This was considered an extra burden on overtaxed inhabitants.

Dr. Freer the Medical Officer of Health for the district, had in his reports to the Local Board, prior to 1890, questioned whether the town's supplies were contaminated. He attributed the town's ill health directly traceable to contaminated town wells. Following his thorough examination of the wells, Dr. Freer was soon to condemn more of the sources. Pressure was then put on the Local Board by higher authorities, resulting in the them offering a prize or a reward of fifty guineas for the best scheme submitted to provide Rugeley with a pure water supply.

Ten schemes were submitted and these were judged for merit by an independent judge, Professor Boyd Dawkins of Owen College, Manchester, an advisor selected by the Local Board.

The first scheme was from J.Creasdale, of Penkrige Bank, Rugeley, who said that good water was available at a spot near Mr. Brown's farm, where a water strata of red sandstone rock existed at a shallow depth. He had no doubt that there was water in abundance at a depth of thirty to forty yards, and the cost of boring would be about ten pounds. The water could be pumped into a tank placed upon a tower.

Scheme number two was from Theo. S. McCallum, C.E. of Manchester, who suggested sinking a well near Four Oaks Colliery, midway between Stoney Brook and Birches Valley, which was to be one hundred and twenty feet deep and eight feet in diameter. It would tap a large number of springs, the bottom of the well being below the level of the springs. No pumping would be necessary, and the water would flow by gravitation to a reservoir on a site near Stone House, which being on a high level, would ensure a good supply in case of fire. From the reservoir the town would be supplied with a double line of pipes. The working expenses would be negligible, and the cost of the works £5,200, excluding cost of land, engineering and law costs. As an alternative scheme, water could be obtained from Stoney Brook at about the same expense.

The third scheme was received from N.Fairley, of Rugeley, and N.Perry, of Lichfield who considered the best and cheapest method to be by means of gravitation, saving the cost of pumping. They proposed to construct a tunnel or tunnels, driven into Fair Oak Hill, 400 feet above sea level thus tapping a number of springs. This tunnel being dammed at the mouth, would act as a storage reservoir, and contain a large supply of water in case of emergency. From there the water would be carried by a six inch pipe to the Market Place, where the main would be about 240 feet above sea level. The length of the main was estimated at 3,818 yards and the water would be of the same quality as that supplied by the South Staffordshire Water Company. The estimated expense would be £3,859. This amounted to a rate of about five pence in the pound.

Scheme number four submitted by W. Wyatt, of Wem, Salop, provided for water to be obtained from the valley near Forge Farm, which seemed designed by nature for the use of the town, and holding a large quantity of water, the ground in the locality being completely saturated. This only required to be tapped at a proper level to provide an abundant supply of most excellent water. He proposed making a well in the field a few feet deep, and to carry the water by iron pipes to a covered surface tank near Sandy Lane, sufficient to hold two days supply. This tank was to be connected to the town, by a main seven inches in diameter, as far as the Market Place, and from there branching forth into the various streets with smaller pipes. The cost of this scheme was estimated at £3,770.

Fifth of the schemes from Mr. Blackshaw, of Stafford proposed obtaining a supply from Stafford Corporation reservoir at Milford. From there the water could be conveyed by eight inch pipes to the Wolseley Road, and on to the Local Board boundary at Eaton Lodge. The estimated cost of delivery would be £3,000, and the cost of carrying out such within the Local Board district, £2,300.

Scheme six, from Mr.J.B.Everard, of Leicester, suggested as the best plan, the sinking of a well near the old rolling mill, south of Hagley Park and so utilising the flow of Hagley or Rising Brook for lifting the water from the well to a service reservoir. To do this the fall from Dutton's Pool would have had to be utilised, and the rights of the brook and the pool acquired. A supply to be brought from the pool through a sixteen inch drain pipe to the rolling mill, where pumping power could be used by means of a gas engine, or turbine, to force water up to a reservoir at the top of Burnt Hill. This receptacle, covered, with concrete arches, would have had a capacity of 250,000 gallons. A six inch main would have conveyed the water to the town, with branches into all the streets. The cost was estimated at £8,650.

The seventh scheme, by R.E.Middleton of Parliament Street, London, proposed to obtain the water from Stoney Brook Pool, to clean out the same and increase its capacity, so that it provided a two months supply. He also proposed to supplement this supply by pumping the water from the shaft of Fair Oak Colliery or from a well in the vicinity, into a reservoir. As alternative schemes water could be supplied from the South Stafford Water Company's pumping station at a cost of five old pence per 1,000 gallons, or from the Stafford Town Water Company's Works at four old pence per 1,000 gallons. The annual cost of these schemes would have been;

Stafford Water Works, £814 2s 10d;

South Stafford Water Company, £843 7s 1d;

for supply by pumping scheme, £3,747 10s 6d; or an annual cost of £460 11s 2d;

and from Stoneybrook Pool £5,347 0s 6d., or an annual cost of £405 12s 4d.

Number eight of the proposals came from Mr.G. W. Usill and F.H. English, of John Street, Adelphi, London, suggesting the drawing of an adit into the hill side, at a point north of Stoneybrook Valley, and at a favourable spot, to bore into the water bearing strata, with a view to tapping the water of adjacent springs.

From here the water would gravitate to a chamber at the east of Dutton's Pool, near the "Horns", and from there, it was proposed to pump the supply to a piece of ground near Stone House, 131 feet above the highest part of the town. A reservoir would be constructed to hold 600,000 gallons of water, a four day's supply, and from here the water would gravitate all over the district. The estimated cost was £5,136. As an alternative scheme, a well could be sunk to the north of the pound in Flaxley Green Road, one hundred and twenty feet deep, and an engine and boiler house erected to push the water to a point one hundred and twenty seven feet above the highest part of the town. The estimated cost of this work was £5,649.

The penultimate scheme, by R.T.Worth, of Middlewick, suggested a supply from South Staffordshire Water Works Company at a rate of six old pence per 1,000 gallons, but he considered as a preferable scheme of bringing the water to the town by gravitation, either from Stoney Brook Pool at Fair Oak Colliery, or from springs at Bevens Birches. He preferred the latter place in case the mine was worked at Fair Oak the scheme would be valueless. He accordingly proposed to construct a large covered well, forty feet deep, at Bevens Birches, with a three inch bore hole one hundred and fifty feet deep, bring up the water without pumping to a reservoir which could be found on the low lying ground beside the spring, holding 934,000 gallons of water, or a fourteen days supply. The head of water would be 164 feet above the town. This could be done at a cost of £5,200.

Last of the schemes came from W.H.Ratford, of Nottingham, proposing a supply of twelve gallons per head for 5,000 people, either by gravitation or pumping. Pumping stations could be found at Etchinghill or near the Brereton sidings. From either place the water could be pumped to a reservoir, holding 60,000 gallons, one day's supply and the water would flow by mains to the town by gravitation. He provided three estimates one for £4,110. another for £4,060, and a third for £3,391. according to the nature of the scheme adopted.

Nine of the schemes were accompanied by detailed plans and were on view to the public, it was said that one of the competitors was seen inspecting other peoples work and incorporating good points in his proposals.

The most feasible scheme to secure the district an ample supply of pure water was considered to be the one designed by Messrs. Fairley and Perry of Rugeley and Lichfield. Mr. W.H.Radford a Civil Engineer of Pelham Chambers, Nottingham was appointed to construct the works after submitting an estimate of £5,500. In order to finance the scheme a loan of £6,000 was obtained from the Prudential Assurance Company at an interest rate of three and a half per cent, repayable at £325 each year. This was equivalent to nine pence in the pound if financed from the rates and conditional on no revenue accruing.

A trial borehole was sunk near Fair Oak Colliery by C.S.Isler of London to prove a source of supply. The results were encouraging and a gravity system was decided upon. A four inch borehole, was dug 158 feet deep at a cost of eight shillings a foot.

Water rose to within four feet of the surface and in forty eight hours consecutive pumping 4,628 gallons per hour were raised. On ceasing, the water immediately rose to the former level, proving a practically inexhaustible supply.

The maximum daily supply required by the town had been estimated at 100,000 gallons, with a visible supply of 110,000 gallons a day, no problems were envisaged. Despite this the Local Government Board insisted on a second and adjacent borehole being sunk to a depth of 100 feet and the usual three weeks test carried out. A second contract was entered into with Isler & Co., and Mr. Child of Hednesford was employed to connect the two boreholes by a deep trench with the waste water allowed to flow into Stoney Brook for six weeks. Flow tests were then carried out daily for a month and the average yield was gauged at 159,000 gallons per day and this following a very dry summer.

A site for the reservoir was chosen at Slitting Mill near to the Horns Inn, this and the site for the borehole having been leased from the Marquis of Anglesey at a perpetual rent of £20 per annum. The red brick reservoir, with a capacity of 150,000 gallons, was puddled with twelve inches of clay and constructed with concrete arches. The level of the receptacle was 122 feet head above the level of the Market Square in Rugeley, giving a pressure of 52 lbs. per square inch. H.Shadow of Hyson Green, Nottingham, laid the water mains at a cost of £2,421, and the whole of the works were carried out under the supervision of W.E.Rogers, Surveyor to the District Council.

Of the nine hundred houses in the town, over two hundred had been connected to the mains prior to the opening of the works on 30th January 1895. Arrangements were made between Lichfield Rural District Council and Rugeley Urban Council to supply Brereton with water, by meter at a minimum charge of £25 per annum. A public ceremony was arranged for the opening. Many of the principal houses and business premises were bedecked with flags and bunting and the day observed as a public holiday.

At two p.m., the members of the Urban Council assembled at the magistrates' entrance to the Town Hall and walked in procession to the Market Square headed by the Rifle Volunteer Band. Drawn up in the Square were the Fire Brigade and there was large number of local inhabitants despite the very cold weather. Chairman of the Urban District Council, William Hislop, was accompanied on the low platform erected for the event, by Mr & Mrs. James Garner, Mr & Mrs. R.D. Anderson and the Rev. & Mrs. Moncrief.

Mr. Hislop who opened the proceedings said they had been invited there that day to witness the ceremony which arose out of the completion of the pure water supply to the town. As Mr Gardner was Chairman of the Local Board prior to the water scheme, at its birth, during its growth and until its virtual completion, it was thought desirable by the present Council which was composed to a great extent of members of the now extinct Board, that it would be a favourable opportunity of showing their appreciation of his valuable services in promoting a scheme which was a boon to the inhabitants of the town and neighbourhood.

To do this they had arranged this formal opening and invited Mrs. Gardner to undertake the ceremony of turning on the water.

Mrs. Gardner was handed a silver key in the form of a turnkey and cross bar, being supported on a shield. The shield surrounded by a lightly arranged design of rushes and water lilies, was inscribed " Presented to Mrs. J.W.Gardner on the occasion of the opening by her of the Rugeley Waterworks Jan. 30th 1895." The reverse side the shield was inscribed with the Rugeley Coat of Arms. In her reply Mrs. Gardner stated it was with very great pleasure that she accepted through her husband their kind invitation to be present to open the new works. She could not have conceived a more acceptable way of acknowledging her husbands service as Chairman, for five years, of the old Local Board. Mrs Gardner then turned the key of the main and the water flowed from the fountain amid cheering.

A luncheon was held at the Town Hall which was attended by all of the local dignitaries who made speeches praising the works. The Rev. Moncrief referring to the time, not so long ago when they were in the position of Coleridge's Ancient Mariner " Water, water every where but not a drop to drink." but these circumstances had now changed with their abundant supply.

Lichfield take-over and pools handed back.

The water undertaking of the Lichfield Conduit Lands Trust was taken over on the 1st of July 1963.

In 1968 agreement was reached in principle with the Lichfield City Council for the transfer to the city by way of gift, of Stowe and Minster Pools. During 1970 at an informal occasion the Company presented the deeds to the Council in full knowledge that the pools would be of recreational benefit to the citizens and visitors to the city. The last occasion the pools were used for supply purposes was for a period of eight weeks during 1962 when Hanch Reservoir had been emptied for maintenance purposes.

New roof for Barr Beacon Reservoir.

Due to the deterioration of the roof and supporting pillars of Barr Beacon No 1 Reservoir, in 1968, a study was carried out of the extensive work required to repair the damage. The survey showed that the safety of the supporting system could no longer be guaranteed. It was decided that it would be more beneficial to renew the concrete slabbed roof. This work was carried out at a cost of £150,000. It involved fixing new pre-cast concrete beams, laid on concrete pads, covered by a continuous butyl rubber sheet to ensure complete water tightness. On completion the work was surfaced with soil and seeded.

Uttoxeter and Seisdon Water Works acquired.

As from the 1st of April 1968 the water undertakings of the Uttoxeter Urban and Rural Districts and the Seisdon Rural District Council were acquired. These acquisitions were in accordance with the policy of the Ministry of Housing and Local Government of grouping undertakings into larger units and it extended the Company's area of supply from 502 to 582 square miles with an increase in population of some 23,000.

Exploration for a new source of supply in the Uttoxeter area, which had already started at the date of transfer was continued and an application for a licence to abstract two million gallons a day from Crumpwood was requested from Trent River Authority.

The early source of supply to Uttoxeter was Bramshall Springs, about one and half miles to the west of the town. A conduit consisting in part of earthenware pipes and open channelling carried water to a reservoir at the edge of the town, the site of which was the Council's Springfield Road Depot. Water was distributed to underground tanks sited in the streets and cellars of the larger houses and drawn to the surface by means of hand pumps.

The Uttoxeter Water Act was promoted in 1892 by the Rural Sanitary Authority and the works were constructed, as finance became available, over the next few years. The work was principally the collection of a series of springs at Somersal, about three miles to the east of the town, their conveyance to the town by means of a six inch gravity main, the construction of a 150,000 gallon reservoir at Bramshall and a new eight inch gravity main from the reservoir to Uttoxeter.

In 1894 the works were taken over by the Uttoxeter Rural District Council and a further take-over occurred in 1896 by the Urban District Council. Another source of supply in use in 1905 was a private borehole, situated by the railway near Bridge Street, which yielded 45,000 gallons per day. Ownership of the borehole passed to the Urban District Council the following year. This borehole was in use until 1926 when it was abandoned on account of the offensive taste and appearance of the water. It was considered not a viable proposition to treat the small quantity of water available.

Crumpwood Springs were purchased in 1922. These were a series of chambered springs known as the Wood Springs about six miles north of Uttoxeter on the north side of the River Churnet, by Crumpwood Weir. Water obtained from the springs gravitated to a pumpwell about two hundred yards away. Over the following six years a pumping station was built, this contained three 11 horse power vertical turbines made by Messrs Gilbert Gilkes & Gordon Ltd. of Kendal. They were driven by the River Churnet and driving three sets of treble ram reciprocating pumps, gave a total output of 15,000 gallons per hour, when the river conditions were suitable to obtain maximum hydraulic power, the water passing through a seven inch main to Prestwood Reservoir.

From this reservoir the water flowed by gravity through a seven inch main to Bramshall Reservoir, supplying Denstone, Rocester and Stramshall en route, and a branch gave a direct supply to the elevated portion of the town at its southern end. Later a standby oil engine was provided to drive the three sets of treble ram pumps.

No 2 pump house, completed in 1937/8, housed a 32 horse power, slip ring rotor induction electric motor, driving a high lift turbine pump capable of delivering 15,000 gallons per hour.

Hulme Springs, Alton, were purchased in 1927. Two boreholes 100 feet deep and 12 inches in diameter were drilled in the bunter sandstone and conglomerate. The top 25 feet was sealed with cement in the rock to prevent the infiltration of any surface water and the lower lengths of steel lining tube were perforated to assist the passage of water. These boreholes were artesian with a reliable yield of 400,000 gallons per day which flowed by gravity through a nine inch main down the river valley to Crumpwood.

Bramshall Service Reservoirs and the Prestwood Reservoirs were part of the Uttoxeter works at the time of take-over. Bramshall Reservoir No 1 was built in 1892. Its brick built walls were backed with puddle clay, a concrete floor was paved with blue brick, with an arched concrete roof supported by brick pillars. The dimensions of the receptacle are 18.5m x 12.7m x 3.7m deep. It has a top water level of 116.738m A.O.D. and a capacity of 0.682 MI

Bramshall Reservoir No 2 was built in 1962. It was constructed from reinforced concrete and the floor has paving laid to falls. Reinforced concrete piers support the roof of the reservoir. Its measurements are 24.4m x 15.6m x 3.6m deep. Top water level is the same as No 1 reservoir and its capacity is 1.136 MI

The two Prestwood Reservoirs had a total capacity of 300,000 gallons, a depth of 10 feet and a top water level of 512 feet above sea level. Water was supplied through two mains, one seven inch and one ten inch diameter to Uttoxeter and the villages on route. The reservoirs supply the lower parts of Uttoxeter by gravity and the higher rural parts by boosting.

Crumpwood Springs are no longer used as they were liable to pollution, Hulme Springs water is still used. Due to increasing demand, two boreholes were sunk in 1968 and a new pump house was erected by the Company. Water is now pumped directly from the boreholes directly into Prestwood Service Reservoirs.

Holly Grange Reservoir was commissioned on 19th October 1982. This completed a significant phase in the reinforcement of the supply system to Uttoxeter areas. Situated in Stocks Lane in the village of Bramshall, the receptacle is located at a level of 140.5 M.A.O.D. and is a reinforced concrete structure with two equal compartments, measuring internally 26.2m x 21.9m x 4.5m deep. It has a total capacity of five million litres.

The reservoir, designed in house by the New Works Department, was constructed by Tarmac Construction Ltd., and provides sufficient storage for one and a quarter days supply to Uttoxeter. The cost of the reservoir construction, valve house, site access roads, drainage and associated main laying on site amounted to £420,000. The valve house includes provision for future booster pumps and a standby diesel alternator and the reservoir was designed with provision for future extension. The cost of the land was £10,000, the original landowner being Mrs. Cope.

Part of the rural area to the south and the west of the town and the high ground in the town are supplied from Holly Grange, whilst lower levels of Uttoxeter will be supplied from the old reservoirs at Bramshall. The flow into Holly Grange Reservoir is controlled by regulating the speed of the pumps at Spath Booster by means of signals from the reservoir level indicators. Key element in the new system was the new booster station at Spath, which is sited on the trunk mains from Prestwood Reservoir to Uttoxeter.

Booster stations at Rocester and Tamworth.

Further booster stations were completed in the 1970s at Croxden, Hollington Lane, Rocester, where two Sultz Bros. horizontal booster pumps supplied water from the Prestwood Reservoir to the Croxden district and at Dods Leigh, Nr.Utttoxeter which housed a Beresford multi stage centrifugal pump to supply water from Overpark Reservoir to the Leigh area and Morrillow Heath Tank.

Two Mather & Platt horizontal booster pumps, which had been in use at Shavers End, and one Beresford vertical, fixed speed booster pump were housed in a temporary timber booster station at Glascote Reservoir Site, Nr. Tamworth, to supply water from the reservoir to Glascote. It replaced the original booster of Tamworth W.J.C.

The last of the steam engines.

A progressive policy of modernisation of the earlier steam stations, pursued since the 1930's was completed in 1971. Maple Brook was the last of the steam driven pumping stations to yield to the march of progress and electrification. At 3.45p.m. hours on the 12th April the last steam engine ground to a halt. It was estimated that the triple expansion vertical engine had consumed 100,000 tons of coal in its fifty-seven year working life. There was good news for steam enthusiasts when it was announced that the engine was to be preserved at the station to provide a permanent link with the great age of steam.

Museum at Brindley Bank.

The original 1907 steam engine at Brindley Bank was preserved when this station was electrified in 1969. Subsequently, the desirability of retaining and exhibiting items of interest from the Company's past was recognised when it was considered appropriate to establish a small museum in part of the adjacent boiler house. Displayed there, are items of historical equipment, including the borehole pump valves of one of the late nineteenth century, Boulton and Watt beam engines from Morse Gorse, a Batting engine from Pipe Hill, early instruments, early documentation, drawings, photographs and newspaper cuttings.

One other giant saved from the breakers is the 1873 Cornish beam engine by J.Davies of Tipton, which survives in an engine house, styled like the original buildings, at Sandfields. It has a sixty-five inch cylinder and nine foot stroke. Ram and bucket pumps on the same pump rod were worked from the beam and it could pump two million gallons per day at seven strokes per minute.

Engineer retires.

R.H.Taylor B.Sc., F.I.C.E. retired from the Company on 31st March 1971. He had been responsible for the planning and development of the Company's largest source of supply works, namely the River Severn Scheme. James Lamont, the Deputy Engineer, was appointed to succeed R.H.Taylor as Engineer in Chief. W.H.Markham, the Distribution Engineer, was appointed to the post of Deputy Engineer.

Reorganisation of water industry.

Following the Government's proposals to reorganise water and sewage services on the basis of all-purpose Regional Water Authorities, nine in England and one in Wales, twenty eight water companies, including South Staffordshire Waterworks Company, were retained in the new organisation to supply water as agents of the Regional Water Authorities. As from 1st of April 1974, the Company became agents of the Severn Trent Water Authority.

The drought of 1975.

The unprecedented low rainfall during 1975/76 caused a national water shortage and the Company's supplies from the River Severn and Blythe were depleted for a considerable time. In July the Severn, dropped to an all time low. In August the Company stopped drawing water from the seriously depleted Blithfield Reservoir. Waste detection duties were carried out on a large scale in an effort to save water.

Many volunteered and worked evenings and weekends to assist in essential operational duties and to help mount the Company's water saving publicity campaign. Stalls were set up in town centres in the area of supply seeking the co-operation of consumers for economy in use of water. As a result of these efforts it was possible to maintain essential supplies. The Company obtained an order under the Drought Act 1976 on September 24th, and from that day all non essential uses of water were prohibited.

Over the weekend of 25th-26th. of September there was very heavy rainfall, Blithfield Reservoir rose almost 18 inches, representing 5% of the total storage, a useful gain, but the drought problems remained for several weeks. Experiments were successfully carried out at the end of September to extract water from the Trent Gravels near Nethertown and pump it at a rate of three million gallons a day into Blithfield Reservoir.

New works at Tamworth.

Information received from the County Planning Authorities during the 1960s indicated that there was expected to be an increased demand for water in the Tamworth Area as a result of the town's development plan. Apart from the target of an additional 13,000 houses there were hopes of industrial development.

In order to meet this increasing demand, the Company decided to carry out new works in the area, a major part of which involved the construction of a new reservoir on a site adjacent to the existing reservoir at Glascote, near Tamworth. The opportunity was taken to include a new booster station in the reservoir structure in order to afford supplies to the new development on high ground around the reservoir, this replacing the existing temporary booster station.

Messrs. Cementation Ground Engineering Ltd. carried out site investigations for the Company early in 1972. This involved drilling eleven boreholes to determine the type and properties of the materials on which the receptacle was to be founded. Coal mining had taken place in the area in past years and as it was essential to ensure there were no workings which might affect the structure, one of the bores was taken down 45 metres.

Glascote Reservoir Nr.2, designed by the Civil Engineering Department, constructed by Tarmac Construction Ltd. was commissioned on 6th of February 1976. Constructed in reinforced concrete, provision was made within one corner of the structure for a combined control valve chamber and booster station. This section includes arrangements for access to the reservoir, sampling points and venting. The entrance is through the steel doors set in a brick clad section of the wall and this part of the reservoir has been made vandal-proof. The re-inforced concrete roof is supported by 128 circular re-inforced concrete columns. The area of the receptacle is 64.4 m x 50.6 m and the water depth is 6.15 m. It's capacity is 18,000 megalitres and the top water level is 111.13 m A.O.D.

Nrs. 1 & 2 reservoirs were designed to receive water from Sandfields and Hopwas Pumping Stations and supply water to Tamworth, Fazeley, Swinfen, Whittington, Wiggington and Comberford.

Connection between Cookley and Elan Valley Aqueduct.

In the summer of 1976 the Company and Severn Trent Water Authority agreed to the laying of a 600 m.m. main between Cookley Pumping Station and the Elan Valley Aqueduct in Cookley Village to enable the connection of the Cookley to Kinver delivery main to the aqueduct and provide a means of supplying up to 36.4 MI/d of water to the Authority in times of emergency. The supply stations are Cookley and Kinver. These works were carried out, completed and tested in April 1978.

Central Transport Workshops, Bridgeman Street, Walsall were established in Bridgeman Street in 1977. The workshop buildings were purchased in May from J.Frankel (Aluminium) Ltd, for £105,000 and were modified for use by the Transport section.

Retirement of Chairman.

On the 19th of March 1979, Sir Charles Burman J.P.D.L., announced his retirement as Chairman of the Board of Directors, although he remained a Director. Sir Charles Burman was born in Edgbaston, Birmingham in 1909 and was educated at Rugby. He became a City Councillor for the Edgbaston Ward in 1934, and he became Lord Mayor of Birmingham in November 1947. He was only 39 years of age, the city's youngest chief citizen since Joseph Chamberlain who earned the distinction at the age of 37.

Sir Charles had many business interests including the Managing directorship of Burman Cooper & Company as well as executive positions with other companies including Tarmac Ltd. Public service, politics and business came as a natural inheritance, following in his father, Sir John Burman's, footsteps. The only deviation was the disinclination of Sir Charles to follow his fathers path to the House of Commons. He received his knighthood on the 1st January 1961. He had been deeply involved in the affairs of the Company during a period of major activity. During his period in office the annual average daily consumption rose from 33 million to 71 million gallons. He was succeeded as Chairman by Mr. Edwin Thompson.

James Lamont retires.

Following the retirement of James Lamont B.Sc., M.I.C.E., the General Manager of the Company, on the 1st of July 1980, W.A.Markham former Chief Engineer was appointed as his successor and D.S.Brown, former Distribution Engineer, was appointed Chief Engineer.

Mergers and Monopolies Commission.

From April, 1980 the sewage and environmental service charges of the Severn Trent Water Authority were included on the Company's demand notes. Arising from these agency arrangements with the S.T.W.A. the Company was, in conjunction with the Authority and East Worcestershire Waterworks Company, the subject of a reference and investigation by the Monopolies and Mergers Commission to determine, first, if its operations were conducted efficiently and without abuse of its monopoly position or against the public interest and, secondly, if the rateable value basis of the water charges for domestic premises abused its monopoly position or operated against the public interest.

The report of the commission was published on 9th of June 1981 and on none of the points referred to the Commission, was the Company found to be pursuing a course of conduct against the public interest. The commission was impressed by the standard of service provided and the level of water charges. Attention was drawn to the high standards of water quality, the effective control of day to day operations, energy economy and the importance attached to cost saving.

New computer, remote meter reading scheme and digital mapping.

In December 1981, the Company took one more step into the future when W.A.Markham officially pressed the button which enabled the new computer to take over the total programme of the Company's computerised system. The new Honeywell Level 64 DPS computer, with a memory capacity of two million decimal characters, replaced the previous twelve year batch processing machines which were becoming unreliable, unable to cope with the increasing demands for new computer systems. This was expanded in 1982 to provide an on line service to 14 remote visual display units in the Meter Option Bureau and the Revenue Department. A Level 6 computer was installed for data preparation in the Computer Department. Equipment and a water quality package from I.C.L. was installed in the Laboratory. The system was further expanded to provide an on line computer service for, purchase, and management accounting, transport, purchasing, central stores, Walsall Reservoir, Burton and Cannock area offices, control office, operation planning, water quality and a word processing service.

First of the computers used by the undertaking was a Honeywell 120 which was installed at Sheepcote Street. In 1967, this was programmed to produce the water rate demands due on the 1st of July of that year and for recording the payment of these accounts. The computer configuration was a central processor with 12,288 characters, printer with 450 lines per minute, card reader of 400 per minute, four magnetic tape units, card punches and verifiers, auto verifier and an interpreter. Programmes were written for wages, expenditure, costing records, stores control, meter billing, salaries and flexi-time.

The Honeywell computer had been surpassed by technology and became outdated.

It was replaced in 1974 with a Honeywell 2041A which was installed to satisfy the ever increasing demands, especially since the introduction of a new wages system. It comprised of 65,536 characters of memory, four magnetic tape drives, a console typewriter, a card reader and two line printers. Input to the machine was by magnetic tape coded through Keytape machines instead of the punched cards previously used with older equipment. Removable disc readers were also gradually incorporated.

Board approval was given in principle in May 1982 to participation in a scheme of remote domestic metering. The Company joined with the Midlands Electricity Board in conducting a trial, under the general auspices of the Water Research Centre, at 100 houses in the Kingswinford Area, in the benefits which could be obtained of remote reading of electric, gas and water meters. The benefits included the calculation and display on the premises of meter readings and their charges. The system C.A.L.M. stands for Credit and Load Management. Each house has a control panel containing a digital display and push buttons like a pocket calculator which was connected to the water, gas and electric meters. It involves the use of an electronic unit containing a micro-processor. A special type of computer at the British Telecom telephone exchange calls each panel, via the ordinary telephone lines. This special computer was also connected to the billing computers in each utility to allow remote reading and automatic billing.

A national working group was formed to consider the advantages which might be available to public utilities in the use of digital mapping techniques by which information required to draw maps can be stored in a computer. As a result, the Company agreed to participate with other public utilities in the Dudley area in a five year trial period which was later extended to six years. In the first phase each of the utilities stored data about its mains and services on the computer programme. When completed each utility obtained information on each others apparatus in the old town of Dudley area, instantaneously. At a later date a scheme was devised whereby in the whole of the Metropolitan Borough of Dudley, statutory notices under the Public Utilities Street and Works Acts were fed into the computer enabling a more efficient identification of each others service equipment. The scheme was set up by the National Joint Utilities Group (N.J.U.G.) whose main computer is installed at the M.E.B. Computer Centre, Kingswinford. Computer terminals were installed for; the Company at Tipton Area Office, the West Midland Gas at Bath Street, Dudley, British Telecom at Wolverhampton and the Midland Electricity Board at Ocker Hill, Tipton. The equipment includes display and printing facilities for maps and the equipment by which the information can be digitised for storage in the computer. The equipment at Tipton Area Office is operated by Company staff.

Consultative Committee formed.

In accordance with the provisions of section 7 of the Water Act 1983, arrangements were made for the establishment of consultative committees for the representation of consumer's interests.

The guidelines of the Department of the Environment advised that members of the committees should objectively assess and advise on the policies, expenditure proposals, standards of service, complaint patterns and level of charges of the Company.

Members of the Committee were appointed from a wide cross section of the community. Ten members were nominated by Local Authorities and nine by specific organisations such as the C.B.I, Chambers of Trade, Industry and Commerce, the Country Landowners Association and the National Farmers Union. Advertisements, inserted in the press for eight members to represent the domestic consumer on the committee, resulted in a good response of applicants, both in quality and volume, who were eventually chosen by giving regard to personal background, interests and also geographical location.

After selecting the required number from the applicants, two committees were formed to serve the Staffordshire section and the West Midlands section representing the north and south of the distribution area respectively. Each committee has a total of 14 members representing the respective sections of the community, hopefully forming a bridge between the Company and consumers. The Consultative Committee is kept informed of the Company's aims and objectives on a consultative and information basis but does not form part of the management of the Company. Meetings are held in January, April, July and October of each year at Green Lane, Walsall.

Control Room at Walsall.

The existing equipment for the telemetry system was installed in the original control room at Bridgeman Street, Walsall in 1969. It was extended with the addition of a computer display in 1973 and later other additions were added, covering the desk with push buttons, meters and indicators. After the transfer to the new offices in Green Lane April 1980, the control room system was reviewed. A decision was made to replace all the separate controls, with three colour T.V. displays (V.D.U's) and keyboards.

The controller has a direct indication of the level of every reservoir and output at every source station. In addition to the summaries of reservoir levels etc. the computer displays show a series of mimic diagrams for reach reservoir zone. These include the state of every major item of plant as well as pressure, flow and level readings and for selected reservoirs a graph of levels is also available. The supply network can be continuously monitored and supply alterations made at selected unmanned remote stations. A total of 28 telemetry outstations have been installed at various sites, which communicate over new ultra high frequency radio links, whilst some still use the traditional land lines of British Telecom. In all, a total of 59 micro computers are contained within the system. The control room is the nerve centre of the Company's operations and is manned 24 hours per day.

Retirement of Engineer.

William A. Markham retired on 18th May 1984 after over Twenty-five years service.

Appointment of Managing Director

James Carter was appointed Managing Director with effect from 19th May 1984 after joining the Company in March. He was formerly elected at the Annual General Meeting held 28th June 1984.

Fluoride added to supplies.

Fluoridation of the water supplies as a means of combating dental caries or decay in teeth originated in the USA in 1945. Seven years later, on the recommendation of the Medical Research Council the British Government sent a mission to the USA to study fluoridation and to advise on its application to this country.

In 1956 fluoridation trials were begun at Anglesey, Watford and Kilmarnock and a report on these trials was published in 1962.

The Company was requested in 1959 by the Lichfield Rural District Council, to give their views on adding fluoride to their water supply. In June 1959, a meeting was called to inform the Council of the Company's policy with regard to the fluoridation of water supplies. This matter was strongly pressed by the Council's Medical Officer of Health, Dr.Jamison. However the Council Committee appeared to share the Company's view that the time was not opportune to introduce fluoride into the supply until further experiments were completed and the Ministry had issued recommendations on the subject.

The Minister of Health announced in 1962, that the Government would give approval to schemes for the introduction of fluoride into the public supply. The Ministry of Health, in a circular letter, drew water undertakers' attention to the Minister's announcement in the House of Commons and expressed the view that water undertakers' present powers were adequate to permit the addition of fluoride. In the event of court action, the Ministry of Health had undertaken to indemnify both the local authorities and water undertakings concerned.

Following the introduction of the Water (Fluoridation) Act 1985, the Company was requested by the West Midlands Regional Health Authority to add fluoride to all sources of water supplied by the Company. It was necessary to design and construct fluoridation plants at the various sources. During 1986 plant at Cookley, Churchill and Hagley was commissioned. The phased commissioning of fluoridation plant at the major treatment works and a significant proportion of underground water sources took place in 1987.

The Company's fluoridation programme was completed by 1989. Concern has been expressed over the level of indemnity required by the Company to meet the potentially huge cost of damages from legal action as the result of using fluoride following the Water Privatisation Bill. Now awaited is the outcome of the Severn Trent Water Authority's proposals to stop fluoridation at the termination of existing agreements with Regional Health Authorities, unless adequate assurance regarding indemnities, is given by the Government.

Nitrates.

From the early 1950s all water suppliers, including private companies or public authorities, were compelled to meet levels on nitrates in drinking water laid down by the World Health Organisation. The W.H.O. decreed the maximum limit required to avoid any health risk was 100 milligrams of nitrate per litre of water.

In July 1985, the E.E.C. Drinking Water Directive came into force and one of the standards defined related to the presence of nitrates. This subject attracted considerable media attention at the time. The EEC decided the existing level was too high for the countries of Europe and a new limit was established. This new level dictated that all drinking water should contain no more than 50 mg per litre.

Where nitrate levels exceed the E.E.C. recommended limit of 50 mg/l, additional monitoring is carried out in conjunction with local health authorities. Throughout the Company six of twenty six borehole sources, whilst well within the 100 mg/l limit, do exceed the 50 mg/l threshold. Fortunately the Government was sympathetic and issued a "Derogation" to allow the concentration of nitrates found in certain supplies to exceed the advised maximum amount for three years, providing the suppliers do not exceed 80 mg per litre.

During this review period the Company is carrying out extensive investigations of the sources with high nitrate concentrations. Research is being carried out at the Water Research Centre and in conjunction with the Cranfield Institute of Science and Technology for which the Company are providing funding. A combined application for substantial E.E.C. funding to undertake further research is currently under consideration. It is hoped that this will lead to nitrate plants being constructed at Company sites within a three year period.

The Company in Malawi.

As a result of the Water Act 1983, the Company decided to market its skills in water supply management to the developing countries. It was also decided that any contracts obtained should be carried out using existing resources. A contract worth nearly £250,000, funded by the Overseas Development Administration, was awarded to the Company in 1985.

The contract involved specific areas of training for staff of the Blantyre Water Board, Malawi, East Africa, including the identification of computer requirements, customer billing, automation and telemetry. The contract will cover a period of three years and will involve staff exchanges between the Company and the Blantyre Water Board. Apart from making a modest income to the Company's income, the venture provides an invaluable opportunity for the staff to broaden experience and skills whilst contributing in a small way to the solution of water problems of the Third World.

Descaling Contract.

Over the years the bore of much of the Company's 3,300 miles of mains have become corroded with rust and encrusted with scale. Renewal of these mains is prohibitive in terms of cost and disruption to the environment and consumers. An effective and low cost solution has been achieved by reconditioning structurally sound mains by scraping encrustations and relining with cement mortar.

A two and a half million pound contract for a water main renovation programme, spread over three years, was awarded to Tate Pipe Lining Processes in January 1985. The deal was sealed when Mr. Carter signed the agreement with John Grace managing director of Tates Ltd.

The "Tate" process was first developed in Australia and was extensively used in Sydney during 1930-32 before being introduced in Great Britain two years later under British patents.

Manchester Corporation Waterworks entered into a contract with Tates Pipe Lining Processes Company of London early in 1934 for the cleaning and relining with concrete in situ of 10 miles of various size mains. Since then, the successful system and method has been improved upon. Excavations are made about every one hundred and twenty metres along the main, a piece of main is then removed and the apparatus for scraping is then inserted. The scraper is then pulled through the main, during the whole time the scraper is being propelled through, a flow of water is maintained in the reverse direction to wash out the broken up corrosion into the excavation, from which it is pumped continuously. Following the completion of the scraping of the length, the main is flushed to complete the removal of loose deposit. A new lining is then applied to the main by pumping cement mortar of the correct viscosity to a device which spins it on to the inner pipe surface, now cleaned. The thickness of the lining is determined by the speed of winching. A troweling device on the unit smoothes the fresh mortar. Up until the present time twenty per cent of the Company's mains network has been treated, a renovation programme which was started in early 1970s.

Privatisation Bill in Parliament.

The Government's white paper on the privatisation of the water industry was published on 5th February 1986. Some or all of the 10 authorities in England and Wales were expected to be sold in their present form, responsible for managing the whole of the water cycle. The water authorities assets were valued at £27 billion pounds. The present 28 statutory water companies were expected to be turned into public limited companies along similar lines.

The National Garden Festival.

The Company participated in the National Garden Festival at Stoke-on-Trent, which was opened by Her Majesty the Queen on 8th May 1986, with an exhibition garden in the Pebble Mill area of the festival on the theme " Use Water Wisely." The Company built the garden to bring home to the public the importance of effective use of water in gardening and everyday life. The Company's exhibit won a gold medal in the category " Specialists Gardens." The garden's design was based on four streams which radiated from a central gazebo among flowerbeds. At each corner was a pond and a piece of sculpture, with a pool edged with plants in the centre. A fountain added to the sense of water movement and within the gazebo were display panels which gave interesting facts about the use of water in the garden. All the construction work in the garden was done by Manpower Services Commission run by the Caldmore Community Programme Agency

Overseal Reservoir completed.

Work commenced on 2nd June 1986 on the construction of a new reservoir at Burton Road, Overseal, six miles south of Burton on Trent, to provide additional storage for the Winshill Tower supply zone. At that time the only storage in the zone was Winshill Tower, approximately one hour's supply in the event of Chilcote Pumping Station failing. The contract for the reservoir was let on a design and construction basis to enable the selected contractor, in this case Biwater Construction Ltd., to take full advantage of their knowledge and expertise in carrying out the contract.

The 4.5 Ml receptacle, has a top water level of 125.6 m A.O.D. and is basically a reinforced concrete box with a booster station attached. Cast in situ, the reinforced concrete structure combines an integral valve house, booster pumps and access tower. Its walls are pin jointed top and bottom with the roof and floor acting in tension. Other parts of the overall scheme included a 400 mm bypass main around the high ground in Mount Pleasant, approximately 1200 metres of concrete lined ductile, No Mans Heath Booster Station (at Chilcote Pumping Station) and a complete revamping of the existing Winshill Booster Station to incorporate new Winshill Tower Boosters and Bretby Boosters where there are two booster stations in one building.

The reservoir, which receives its supply from Chilcote P.S. and Outwoods Reservoir via Saxon Street Booster, was commissioned in March 1987, ahead of schedule, and is estimated to have cost £575,000 with the Biwater contract costing £392,000. It supplies Overseal, Linton, Lullington, Cauldwell, Rosliston, Coton in the Elms, Castle Gresley, Winshill and Brethby. Land for the site was purchased from Messrs. Southerd and Moore, landowners of the sites for the bypass main were E.M.Calcott (land to be sold, current owner not known), Messrs Cook and the National Coal Board (Tennant E.M.Calcott).

Old steam engines removed from Hopwas.

It was announced in March 1987 that work would start soon on removing the 100 years old steam engines from Hopwas Pumping Station near Tamworth. Lichfield District Corporation gave planning permission for the Gimson engines, to be dismantled and taken from the disused engine house which is a grade 2 listed building, to steam museums, the Company deciding that there was little prospects of the engines being restored at Hopwas. The minimal space around the engines, combined with the steep, narrow spiral staircase, leading to the beam gallery and the hazardous open pattern floor plates, made public admittance a liability.

The Forncett Industrial Steam Museum at Norwich and the Leicestershire Museum of Technology had pledged to restore the engines to full working order and steam them regularly, and so Woody and Spruce the engines named after contemporary local notables of the day, Dr. Woody and Mr. Spruce have now moved to new homes.

Open Days.

In recent years the Company has deliberately raised its profile to its customers and the public at large by an active press and media campaign. The Company took part in Water Companies Week during June 1987, as part of the European Year of the Environment, along with the other companies, all members of the Water Companies Association, each holding a range of events including open days. South Staffs. Water held an open day at its Head Office, Green Lane, Walsall. Its range of events included guided tours, demonstration of equipment, a schools project and a tree planting ceremony using the original spade which dug the first sod at Scout House Reservoir over a hundred years previously.

More than 2,000 people poured into the treatment works at Seedy Mill, in September to get a behind the scenes look at the supply of water, from source to tap. There were many displays and demonstrations of the latest equipment used for water treatment. Both open days proved a great success and a further open day was held at the Green Lane Offices in 1988.

The most successful Open Day took place on 25th of June 1989, approximately 6,000 people, attended Green Lane Offices.

The Company exhibited many items of technology and methods of working which were contributing to its overall efficiency. One of the items displayed was an "Air Knife", and vacuum excavator. The Company is testing this equipment on a long term trial. It is a portable device which directs a jet of air at two or three times the speed of sound at soil surrounding a water pipe or cable. It is very selective in its attack, extremely aggressive towards soil but completely harmless to solid matter like a gas main. The vacuum excavator, which removes soil from the hole, is the natural partner to the air knife. Working together, they can remove soil in a fraction of the time it would take to dig by hand and has the added advantage of greater safety.

Amongst the other attractions was a steam engine and fire engine display, a girls pipe band and the Bank's Brewery Band. Customers were able to tour the Company's modern headquarters, the laboratories where water quality is tested daily and the control room where the supply is regulated. A hot and sunny day was an added bonus to the proceedings.

Regulations of 1853 to the new model byelaws of 1987.

In 1987 the Company submitted an application to the Department of the Environment for the conformation of new model byelaws. The earlier history of all water undertakings shows that they were continually faced with problems of waste, and later with misuse and contamination of their supplies. For these reasons they sought preventative statutory powers.

One of the earliest Acts giving power to prevent waste, due not only to defective piping but also the primitive methods of storage adopted, was the Manchester and Salford Act of 1823: "In order to prevent as much as possible the wilful and negligent waste of water, every person supplied with water shall provide a proper cistern to hold such quantity of water as shall be deemed sufficient, and to provide the same with a ball and stopcock fixed to the pipe supplying water from the main or service pipe". Further to this it stated that the apparatus was to be kept in good order and water was not to be allowed to run to waste when a cistern was full. In the event of neglect to provide a cistern, ball and stopcock the Company were authorised to cut off the water until the necessary apparatus had been provided.

Water regulations were first issued by the South Staffordshire Waterworks Company in 1858 and were updated in 1862, 1866, 1868, 1870 and 1897. These booklets also included details of varying water charges, the last of these regulations booklets was published in 1907. To quote from the 1858 edition, "No cisterns for storage of water, for domestic use, will be necessary, but cisterns must be provided for water closets and for supplies of a peculiar kind, it having been found in practice that, where water closets have been supplied by pipes direct from the main, foul air and impurities have occasionally flowed back into the street pipes when the water is stopped for laying on services or repairs, thereby causing much annoyance to the Companies as well as the inhabitants".

The owners and occupiers must, at their own expense, lay down and maintain all the service pipes connected with the Company's mains, or distribution pipes and apparatus required for their use, of the strengths and descriptions and subject to the following rules:

1 No pipes or cocks must be used until they have been inspected and approved by the appointed officer of the Company.
The water closets must be of the kinds known as the "Pan Closet," or the "Self acting Closet" and must be provided with a full and complete apparatus comprising service cistern, basin, trap, etc., excepting that the Self acting Closet may have substituted for the pan or service box, a double valve, regulated quantity of water.

2 The water supplied must not be allowed to run to waste, either wilfully or by neglect, nor must it be used for any other purposes, or to any greater extent than shall have been agreed for.

3 No pipes must be attached to the works of the Company, or to any pipes or apparatus connected therewith, nor must any alterations of pipes, or extensions of the supplies of water, be made without the consent of the Company.

4 The supply and use of water for the purposes of trade and manufacture, must be open to inspection and and measurement whenever required.

5 The Company, if required, will undertake to lay on the necessary service pipes and apparatus at the expense of the owner or occupiers, at the same time, they would prefer such business being done by the plumbers of the town, who are willing to perform the work. For the protection of the interest of the public, as regards the proper execution of the plumbers work, and to enable them to acquire the requisite knowledge of the state of the service pipes and apparatus, the Directors have determined not to recognise or employ any plumber until he shall have signed an undertaking to comply with these rules and regulations, reserving to the Company the power of erasing from the list of authorised plumbers the name of any one who shall evade the same or refuse to act in strict conformity therewith.

All applications to be made to the Secretary at the Company's Offices, Castle Chambers, High Street, Birmingham.

By order of the Directors,
Josiah Churchill.
Secretary.

December 1858.

Regulations as distinct from byelaws, may be defined as being special rules made by a sanitary or other authority by virtue of particular powers conferred upon it and applicable only to a limited area or class of people within its jurisdiction. The main distinction is that a regulation could not be enforced by a penalty, because there was no statutory authority behind it but could be enforced by withholding of some concession or sanction. Penalties were quoted in regulation books but were enforced under Local Improvement Acts.

During the 19th century the Company was guided by the Water Clauses Acts of 1847 and 1863, which were later incorporated by Section 57 of the Public Health Act of 1875, plus their own Act of 1866 and the Burton on Trent Act of 1861. Regulations contained clauses which specified that work was to be carried out to the satisfaction of the Engineer, Surveyor or by a plumber approved by the water authority or company.

Byelaws may be defined as supplementary legislation, framed by water undertakings under statutory authority, for the guidance of the consumers of the area under their control, ordering something to be done or not to be done and accompanied by some sanction or penalty for its non observance with the force of law for its legitimate operation. It must not conflict with the laws of England and must not be unreasonable. The Company's authority to make Byelaws was obtained in their Act of 1909

Through the years many infringement cases have been tested in court, mainly to set examples and to direct the attention of the plumbing trade in general to the existence of regulations and byelaws. A majority of cases were proved. Occasionally a case was lost on a technicality. In 1885 at Dudley Magistrates Court, Alfred Guest a plumber was charged with making an alteration to a service without the consent of the Company. A ball valve in the w.c. cistern had been removed so that water was continually running into the w.c.pan.

According to Statute the prosecution failed because the offence was not laid before the Court within a period of six months of the offence being committed.

An effort to gain uniformity, in Regulations and Byelaws, started in 1903. The Worshipful Company of Plumbers was responsible for calling what proved to be the inaugural meeting of the Joint Standing Committee on Water Regulations at the Guildhall, London. The Conference attendance and the widespread interest which evoked amongst Water Authorities, Engineers, Architects and other interested parties proved there was an existence of a general desire to co-operate for codifying and standardising the byelaws and regulations in common use throughout the United Kingdom. The Committee under the auspices of the Institution of Water Engineers was incorporated by licence of the Board of Trade in 1908 and during that year it issued a Model Code of Byelaws and Regulations. A new Model Byelaws was issued in 1912 and a second issue in the same year contained revised specifications which was supplemented in 1913.

During the period to 1920 the water industry took every available opportunity to express dissatisfaction at the inadequacy of the current byelaws and were loathe to accept them. Statutory Powers obtained from private enactments gave them greater means of control than the Model Byelaws.

In 1919 the British Waterworks Association took over the powers and duties of the Incorporated Joint Committee on Water Regulations which was wound up in voluntary liquidation.

A draft series of byelaws and regulations, including a specification of pipes and fittings was drawn up by the B.W.A. Standing Committee on Water Regulations in 1921. This was ultimately submitted to the Ministry of Health with a request that it should be substituted for the 1911 edition of the Model Byelaws. Strong objections were made to the Minister from property owners, fittings manufacturers and other interested parties and the document was rejected. One of the byelaws strongly objected to, was a provision requiring an eighty gallon storage cistern.

Following on from several meetings with the Minister of Health, The Right Honourable Neville Chamberlain M.P., representatives of the British Waterworks Association and opponents of the Associations, a Committee was set up with all sides represented to advise the Minister on questions relative to specifications for pipes and fittings. The Committee consisted of twelve, two Ministry officials, four manufacturers, three water engineers and three plumbers. On this Committee sat F.J.Dixon the Company's Engineer in Chief who had been instrumental in the Company becoming a member of the British Waterworks Association in 1918.

At a meeting of the Directors of the South Staffordshire Waterworks Company in March 1921 the "Specification of Standard Pipes and Fittings" was adopted throughout the Company's area of supply. It contained 41 Regulations. The document was later embodied in the byelaws, but until that time its specification could not be enforced.

Fred J.Dixon prepared a draft copy of a Code of Byelaws in 1926, for submission to the Ministry of Health, in accordance with Section 40 of the South Staffordshire Waterworks Act of 1909, such byelaws to incorporate the Model Code of Byelaws as presented to the Minister of Health and these were published in 1928.

All water fittings were tested and stamped prior to fixing and for this purpose a testing station was set up at Wood Green.

The 1928 edition of the byelaws remained in force until 1938, just as a campaign was being mounted to produce a comprehensive revision of the byelaws, the Second World War intervened.

The Water Act of 1945, for the first time brought uniformity into the law relating to the making and enforcement of water byelaws. New editions appeared in 1956, 1966 and 1980, each of which has been based on the Model Edition of the time.

Powers to make byelaws are found in Section 36(3) of the 1973 Water Act and sections 17 and 19 of the Water Act 1945. Section 2 of section 19 requires that it shall be the duty of any undertakers, by any such byelaws are made, to enforce those byelaws.

In 1987 the Company submitted an application to the Department of the Environment for confirmation of the new model byelaws. These replace the 1966 edition which were technologically considered out of date and inhibiting progress in the plumbing industry. Also a number of the byelaws were considered ultra vires (beyond ones powers). Incorporated in the new document, which became operative from the 1st of January 1989, are the changes in technology and include the use of unvented systems, the prohibition of lead in any potable water supply and the prevention of contamination. The number of byelaws has been increased from sixty one to one hundred and one.

Inspectors to enforce the regulations and byelaws were employed by the Company from its earliest days, the first being William Darlington in 1865, closely followed by John Hurst and Samuel Woodhall earning £1-2s-0d for a seven day week, although some of the regulation work was delegated to the watermen. Other Fittings Inspectors of note, during the last forty years, have included, George Eades (Cannock), O.Whittall, Harry Oldnall (Walsall), Pat Wright, Phillip Smith, Bill Stokes, Les Hill, Jack Chater (Tipton). Of today's Water Regulation Staff, the descriptive title having been changed in 1981, Geoff Ford is the longest serving with 27 years in the Department, followed by Brian Briggs and Brian Williams with twenty four years each.

Probably the Company's greatest authority on byelaws was Bernard Hawkley, a Technical Assistant, who died at the early age of 43 in 1971. He was a prolific writer on byelaws and plumbing matters and a well known voice on the subject in this country. To quote from an appreciation of Bernard published in the News Review in 1972; "He was planning for the day when his ideas on modern plumbing would become every ones. Perhaps they may yet become his permanent memorial." The widespread acceptance of the unvented hot water and heating systems in this country, of which he was an advocate, is one of the changes that would have pleased him.

Area of supply and the Company's works.

The Company's statutory area of supply, which is some 582 square miles in extent, today includes the major portion of the "Black Country" in South Staffordshire and extends from the fringe of the Peak District of Derbyshire in the north, to Halesowen in the south, from Kinver in the west, to Burton on Trent in the east.

Very undulating in character, the area of supply varies in elevation from 140 ft. to 932 ft. above sea level and the extension of piped water supplies to all parts of this area has led to a highly complex distribution system which has rendered necessary many different pressure zones involving considerable repumping.

There are 26 borehole sources, 37 re-pumping stations, 35 service reservoirs and towers in the system and a programme of automation of the source and booster stations is being pursued to improve efficiency. Total length of mains in service is 3,300 miles, varying in diameter from 45 inch downwards. The complicated system of trunk mains from the numerous pumping stations and service reservoirs, and the widely varying ground levels, particularly in the southern area, have added considerably to the complexity of the distribution system. In 1986/87 a population of nearly one and a quarter was supplied, provided with an average daily consumption of a little over 73 million gallons per day, roughly a third of this is used by industry. The number of dwellings supplied is 561,200 and the number of metered supplies exceeds 16,360.

From 1950, the 1000 water undertakings, some owned by local authorities, others by companies and some by joint water boards have been drastically reduced by government until today the water industry in the United Kingdom consists of; in England and Wales, 10 Regional Water Authorities under the supervision of the Secretary of State for the Environment for England and Wales, responsible for water supply, sewage and sewage disposal, pollution control etc.. Nine of these Regional Authorities, Severn Trent is one, discharge their water supply responsibilities through twenty eight Statutory Water Companies which remained intact, many having been in existence for decades. South Staffordshire Waterworks Company is the second largest of the water companies, the largest being Essex Water Company.

In Scotland there are twelve Regional and Island Councils, responsible to the Secretary of State for Scotland. The Department of the Environment for Northern Ireland is responsible for all water services throughout the Province.

Proposals for water rate based on rateable value to be phased out.

In February 1988, the Company, together with other water companies and the water authorities were given a twelve year deadline by the Government to replace the system of water charges based on the rateable value of properties. Junior Environment Minister Colin Moynihan stating in the House of Commons, that water rates will be abolished by April 1st. in the year 2000. It was expected that, in most cases water rates will be replaced by water meters, although an option of a flat rate charge on the size of the property or a flat rate charge, with supplements for hose pipes would be considered. In February 1989, the Company announced increases of 19.5% for both measured and unmeasured water supplies. The large increase was partly caused by the necessity of complying with new E.C. Standards governing water quality. The Company has also incurred and will continue to incur considerable costs as part of complying with proposals contained in the Water Bill to privatise the Authorities. These two factors will herald a new era in the level of charges nationally. The charges however remain as in past years, among the lowest in the country.

New contracts overseas .

A second major contract within two and a half years for consultancy work in the East African State of Malawi, was won by the Company in 1988, despite stiff competition from a number of U.K. water authorities. The new contract worth a quarter of a million pounds, was with the Lilongwe Water Board, which serves Malawi's capital city of Lilongwe. It was to be funded by the U.K. Overseas Development Agency. The contract , which stated in the New Year and spans a three year period, covers activities such as waste control, accounting and control systems, distribution, electrical and mechanical services and payroll and financial records. Work coincides with a new dam being built there, which had been funded by the World Bank.

The Company won a new contract in 1989 following competition with a large number of Water Authorities. This latest contract has been awarded by the Water Utilities Corporation of Botswana for training assistance.

Research on nitrate reduction.

By 1989 the Company had made progress regarding nitrate reduction by both blending and treatment schemes. Research continued on nitrate removal, primarily investigating ion exchange technology and this has resulted in a novel process which has been patented. The construction of the first plant in the United Kingdom for denitrification is progressing at Little Hay, and the pilot trials conducted there are to be extended to other sites. Other research and development effort is concentrating on reverse osmosis and electro dialysis. The future nitrates programme is designed to ensure compliance with the E.E.C Directive by 1995/1997.

The South Staffordshire Area owes no small part of its success and rapid development in the past to the existence of an excellent water supply, which has been of inestimable value to the health and well being of the community. South Staffordshire Waterworks Company has been largely responsible for that supply. It is regretted that the well tried and simple system of control embodied in the Statutory Water Company is to be abandoned in the new Water Bill now near to completion in its passage through Parliament, it will be necessary in due course to decide whether to remain a "Statutory" Company or convert to a P.L.C.

Despite all the changes one thing remains unchanged, the need for a pure and plentiful supply of water, the prime object of the formation of the Company one hundred and thirty three years ago, underlining their motto "Nil Sine Aqua", nothing without water.

CHAPTER 6

The Head Offices and Secretaries of the Company.

The Company's Head Offices since 1853 have been situated at Lichfield, Walsall, Wolverhampton and Birmingham. With the move to Green Lane, Walsall the site changed for the tenth time. Occupancy has lasted for periods of six months to fifty two years.

Largely through lack of financial resources, until 1890, when the Company bought premises, its policy had been to rent or lease its headquarters. During the first eleven years of its existence, offices in railway stations owned by the South Staffordshire Railway Company were utilised by the Company for waterworks business due, no doubt, to Richard Dyott, Charles Forster, Richard Greene, Richard Jesson and Richard Chawner holding joint directorships of both companies. The other important link was John R. McClean, owner of the South Staffs. Railway Company and Engineer to the South Staffordshire Waterworks Company. In 1853, the Company's operations were directed by Thomas John Buckton, first of the Company Secretaries from the offices of Lichfield City Railway Station, a building which enjoyed a short life, only lasting till 1877, less than twenty eight years, when the station was demolished to make way for a goods station.

Buckton's salary for the part time waterworks position was £25 per month, and he combined the job with his position as Secretary of the S.S. Railway Company and his accountancy profession. This arrangement continued until 23rd of January 1855, when Buckton expressed his inability to devote the whole of his time to the waterworks affairs and he tendered his resignation. Buckton was requested to continue his services to the next half yearly meeting of the Company and then to submit his resignation. It was agreed to pay him £50 in addition to his quarterly salary.

For the following six months, Head Office was to be found at the railway offices of Walsall Railway Station in Station Street. Edward Adams designed the building which was similar in style to Lichfield Railway Station but smaller in scale. Historian E.L.Glew writing in 1856, described the 1849 building as an "exceedingly handsome structure in the Elizabethan style, highly ornamental to the town". The station's end in 1978, caused an outcry from conservationists and its demolition was described as an act of public vandalism, extinguishing the last flame of the old South Staffordshire Railway.

On 17th July 1855, it was found necessary, because of increased railway traffic, for the Company to seek temporary accommodation at Darlington Street, Wolverhampton, where an office was rented for £8.00 per quarter, from John Rutter who carried on his profession as a solicitor from the building.

An Assistant Secretary was appointed in December 1854, Josiah Churchill of Wolverhampton at a salary of £250 per annum. He was requested to devote the whole of his time and attention to the disposal of shares.

His appointment as Company Secretary came in February 1855, this minute was rescinded at the Board Meeting in March 1855 as the resignation of J.T. Buckton had not been accepted. At the same meeting Buckton's resignation was accepted and it was resolved that Josiah Churchill be appointed for one year at a salary of £250 per annum commencing December 15th 1854 and terminating December 1855, at which time his term of office was further extended.

Churchill toured the district promoting and pressing the claims of the undertaking on everyone he came into contact with, displaying a peculiar power of persuasion in disposing of shares. He travelled the district by his own horse and trap, the Company paying for the upkeep and feed of the horse, no doubt the first of the mileage allowance recipients.

At a Board Meeting in April 1863 the question of the receipt by the Secretary in 1858 of a deposit of fifty pounds, on a Mr. Lawrence's fifty shares, not being paid over to the Company's Bankers until the 16th of April 1863, was considered by the Board in the absence of the Secretary. The Secretary was then called in and he offered certain explanations of the matter in question. Churchill was then requested to retire to enable the Board to consider the matter. W.V. Houghton the Company's Auditor was instructed to investigate the Accounts since his last audit at his earliest possible convenience. According to the Company's Auditor, Churchill appropriated £308 9s 8d on the Capital Account and £860 on the Revenue Account.

Held in high esteem by everyone, it came as a shock when Churchill was asked to resign as Secretary, having been adjudged of falsifying the accounts of the Company and thereby forfeiting the confidence of the Board of Directors. A warrant was issued for his arrest. Churchill's whereabouts remained a mystery until a letter, dated 17th June 1863, postmarked Spain and addressed to the Company, gave particulars of money appropriated by himself.

In the letter he outlined the discrepancies, quoting from memory, they amounted to £947, the largest of the accounts being £400 from the West Midland Railway Company, £120 from the Wolverhampton Waterworks Company and £53 from the Walsall Commissioners. After discovering the deficiencies he had travelled to Peterborough to visit his wife, with the intention of returning to the office the following week, to inform Mr Houghton the Company's Auditor, of the losses. A Solicitor friend advised him to leave England, advice he later regretted taking. He did not wish to throw the blame on other parties, but felt himself highly culpable in not keeping accurate and regular cash accounts. Had he done so, the deficiencies would not have occurred. Attention was directed at office clerk W. James who took considerable sums of money belonging to the Company. For years he had trusted him to do what he should have done himself. Many sums had been entered in the office diary as cash paid to him by James, which he had no memorandum of, or could he trace in any way. When James had left the Company's employ, Churchill regretted having not acquainted the Directors with the reason for his departure and not taken things into his own hands, a thing he did from kindness to James believing he had revealed all. After repaying sums specified by James there was still a shortage of £400 when he checked the books.

In an effort to balance the books, Churchill tried to borrow money on his life insurance policies and arrange for a loan but following a decision of the Board of Directors the following week, to inform the police and offer a reward for his arrest, it was impossible for him to complete the loan.

He bitterly deplored his folly and asked for an opportunity to return to England to seek diligent labour to recover his position and repay the debt. When Churchill entered the office of Secretary, he was promised commission on the shares he disposed of, a total £550. All he received was 20 shares valued £7 at the time. His salary of £500 per annum had been reduced to £300 and moneys were owed him for office furniture, petty cash and office disbursements.

Five years later, Churchill wrote to a friend in Walsall, asking him to use his influence in an effort to obtain a settlement with the Company. By this time the health of himself and his family was giving cause for concern.

The Company's claim against Churchill was £1,168 9s.8d. His case was taken up by Samuel Wilkinson of Solicitors, Wilkinson and Gillespie of Walsall in September 1869. Furniture belonging to Churchill from his home in Walsall had been sold for him, by a friend in the town, and this realised £300 and Trustees had set up a small fund. They were desirous of winding up their connection with the business. The Solicitors wrote to the Company offering to pay the creditors a composition of three shillings in the pound after obtaining Mr Churchill's authority to do so. Had this not proved acceptable to the Company, it was intended to dispose of the assets some other way.

A meeting between the parties was held in December 1869 when in return for a certified copy of a resolution, with the Company's seal attached, giving Josiah Churchill a complete release, the Company were paid three shillings in the pound on the debt of £1,168.

Anyone visiting Sandfields Pumping Station may be puzzled on seeing a bronze plaque, listing the Company officials of that era, with signs of a name at the bottom of the plaque having been erased. The name erased was Josiah Churchill.

Further office migration occurred in 1856, after negotiations between J. Churchill and estate agents Birch and Rawlings, for use of an office at Castle Chambers, High Street, Birmingham, at a rent of £40.00 per year. The site was chosen for its supposedly central position in the district. Principally, it was more convenient for directors, shareholders and staff.

An inventory and valuation of office furniture at these offices was made in May 1857, by Auctioneer and Valuer, J. Smith.

Clerks Office;	Mahogany office desk, 4 feet eight inches x 7 feet 6 inches with
	brass rails and five drawers. Mahogany table
with three drawers,	Two chairs with
high backs covered in leather.	

Front office; Mahogany desk 4 feet 6 inches x 2 feet 6 inches with a circular front fitted inside and six side drawers, Oak bookstand 4 feet 9 inches long x 1 foot wide, Brussels carpet 14 feet 8 inches square, fender with circular front, Six chairs, mahogany leather, Mahogany chiffonier, Oak office table, the whole valued at £40. 18s. 0d.

Move number four came in February 1859, when it was resolved by the Directors to acquire a more convenient base nearer the centre of operations at Bridgeman Place, Walsall. Previously used as a temporary railway station, the offices were sited opposite the junction of Station Street and Bridgeman Street, adjoining the Walsall Racecourse, and were leased for four years at £40.00 per annum, plus £15 a year for cleaning services.

A second period at the railway station in Station Street came about in the spring of 1863 when more spacious accommodation became available. The Directors of the London and North Western Railway Company, accepted the Company as tenants of the vacant rooms over the Walsall Railway Station Booking Office, on the following terms, £40 per annum, exclusive of rates, taxes, gas, water and coal, the tenant to be responsible for all inside repairs, the same rent to apply for seven years. The accommodation consisted of the Secretary's, Engineers and General Offices plus a Board Room. An inventory of 1864 shows that each office contained a coal fireplace and the floors were covered by oilcloth, the Secretary's office having the luxury of rugs. Each office contained the usual coal fire accessories; fenders, ash pans, scuttle and fire irons. Other items listed include;

Secretary's Office,
wash
Burton W.W. Company.
Large table and table desk, mahogany cupboard, eight chairs, stand, the Common Seals of the S.S.W.W. Company, and the

Board Room,
Three tables, nine chairs, three blinds, two maps.

Engineers Office
Two desks, five chairs, one stool, a measuring chain.

General Office;
safe,
McClellan's drawing board and tressels.
Oak bookstand, clock, five stools, one chair, noticeboard, iron umbrella stand, iron urinal, small stamp lettered S.S.W.W., Mr

The loss sustained by the Churchill affair was finally written off from the profits of the half year ending June 1863, when no dividend was declared.

At about this time 1863, an Area Office was established in Beacon Street, Lichfield, a letterheading announcing this, appears in the record book although no other information has been found.

With the departure of Josiah Churchill in 1863, applications were invited for a new Secretary resulting in sixteen applications together with testimonials being received.

A short list of three was considered. The parties were Charles Tomlinson, late Secretary of Wolverhampton Waterworks Company, Henry S. Chinn of Lichfield and Henry Haselden.

Richard Chawner accompanied by John McClean journeyed to London to see Sir William Clay, the Chairman of the Grand Junction Water Company in the office of which Company Mr. Haselden was employed, to ascertain by personal communication for his opinion of Haselden's qualification to undertake the vacancy.

Harold Haselden, was appointed to the post, commencing his long term of service in June 1863. T.J. Buckton applied for the position he had held previously, his letter of application stated that a person whom he did not get along with, had departed from the Company, but he was not considered.

J. Porter, Resident Engineer of the Company, requested the Board to clarify his position in the office after the appointment of the new Secretary, intimating that he was not prepared to take orders from Henry Haselden. After considering Porters conduct, the Board gave him three months notice terminating his employment. In consequence, for the following nine years the Secretary exercised full control over the Company's officials and staff.

Haselden tendered his resignation in July 1864 having been offered the position of Secretary to the Grand Junction Waterworks Company. His resignation was withdrawn the following month, his salary being raised to £500 per annum.

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The Company's progress since its humble beginnings in 1853 was emphasised with the opening of the Green Lane complex. The site was purchased in two stages and contains an area of 8.9 acres. In 1978, an existing single storey,, open plan office building, constructed for Tube Investments Limited, was purchased by the Company and refurbished prior to occupation in 1980. By 1981, operations and technical services, Walsall area office, water quality, safety, some administration and management services staff, together with the control office, central stores and workshops, were established there.

Following the closure of T.I.Sunhouse Limited in 1981, further land was purchased, enabling the Company to carry out further development with the construction of a four storey office block, to house the finance, administration personnel and computer departments, transferred from Sheepcote Street. The Harry Bloomer Partnership were responsible for the design of the building and construction work commenced in March 1983, the contractors being F. and E.V. Linford of Cannock.

On Tuesday 10th April 1984, the new building was "topped out," Mr David Linford, Chairman of Linford Building Ltd. marked the occasion by presenting Company Chairman Mr E.J. Thompson with an engraved water jug. The complex was officially opened on 27th June 1985 by the Earl of Dudley who unveiled a plaque to mark the occasion. The Earl followed a family tradition in inaugurating the Company's works following in the footsteps of his great grandfather. In opening the head office he said "I must praise your Company for its efforts over the years to improve the water supplies in this area. It is quite clear that the Company has always been conscious of its ecological and environmental responsibilities".

Former Managing Director W. Markham switched on the fountain at the front of the building. So, after 120 years in Birmingham, Head Office returned to Walsall, beginning a new era.

First impressions of the cube shaped, four storey building, designed on a medieval principle and built at a cost of three million pounds, suggests a pagoda of reinforced concrete. Its external concrete cladding is faced in brick and each storey is jettied out above the one below on the cantilever principle, which was used in medieval buildings. The construction is crowned with a tiled pitched roof.

The four storey administration block was built on a site where numerous mine shafts and underground workings existed. Advice from one firm of consultants suggested that the project was not viable. In all 148 trial holes and 128 piles down to 17 metres were needed. None of the mineshafts on the site proved to be at the spot chosen for the building, but two different levels of past mining activity had to be encountered. Two thousand tons of concrete grouting mix, were pumped into the shafts before building work commenced.

The new offices are designed to be energy efficient, constructed with a high level of insulation, and are built in the shape of a cube because a cube has almost the smallest surface area for the enclosed volume. The use of energy is controlled by a computer based system which monitors office lighting, heating temperatures, emergency lights, toilet ventilation, outside lighting, fire and security systems, the computer suite's air conditioning and the operation of pumps and boilers in the new boilerhouse. Most of this monitoring goes unnoticed as it senses temperatures in the offices and outside, calculates the amount of heat required by the building and controls the pumps and boilers to provide the right amount of heat without waste. The control of lighting is particularly important as energy is wasted when lights are left on when they are not required.

The system switches lights off in the evenings, after work, and on again at the start of work next morning, but it also monitors outside lighting levels and, as the light outside reaches certain levels, the computer automatically switches off unnecessary lights in the offices.

The Company and the Architects were keen to involve local artists and craftsmen in the visual aspects of the building and following discussions with the West Midlands College of Higher Education in Walsall, Miss Sarah Jones, a student in the Visual Communications Department, was commissioned to produce designs which have been incorporated in glass roundels set in the six windows of the main entrance screen. The designs, engraved on glass by John Ely a glass craftsman from Birmingham, illustrate a particular aspect of the water supply industry; its collection, treatment, and distribution; water in the home; water in industry; water for recreation, and the conservation of wildlife in water.

In front of the main entrance, there are brick walled alcoves and pergolas. At the main entrance itself there is a pool incorporating a water feature which produces varied patterns of flowing and pulsing water. The bronze model of a young girl sits on the side of the pool, to illustrate human fascination with moving water. The model was created by John Bridgeman, retired Head of the School of Sculpture at Birmingham College of Arts and Crafts.

A coveted national energy award was won by the new headquarters in 1986, not only winning in the category "Buildings for Working" the building also achieved the Supreme Award, the first ever given to an office block since 1982 when the awards were first sponsored. At a ceremony in the new Lloyds Building in London on 1st December 1986, David Hunt, M.P., Minister of Energy Conservation, presented the trophies to Mr. J. Carter, Managing Director.

CHAPTER 6

The Head Offices and Secretaries of the Company.

The Company's Head Offices since 1853 have been situated at Lichfield, Walsall, Wolverhampton and Birmingham. With the move to Green Lane, Walsall the site changed for the tenth time. Occupancy has lasted for periods of six months to fifty two years.

Largely through lack of financial resources, until 1890, when the Company bought premises, its policy had been to rent or lease its headquarters. During the first eleven years of its existence, offices in railway stations owned by the South Staffordshire Railway Company were utilised by the Company for waterworks business due, no doubt, to Richard Dyott, Charles Forster, Richard Greene, Richard Jesson and Richard Chawner holding joint directorships of both companies. The other important link was John R. McClean, owner of the South Staffs. Railway Company and Engineer to the South Staffordshire Waterworks Company. In 1853, the Company's operations were directed by Thomas John Buckton, first of the Company Secretaries from the offices of Lichfield City Railway Station, a building which enjoyed a short life, only lasting till 1877, less than twenty eight years, when the station was demolished to make way for a goods station.

Buckton's salary for the part time waterworks position was £25 per month, and he combined the job with his position as Secretary of the S.S. Railway Company and his accountancy profession. This arrangement continued until 23rd of January 1855, when Buckton expressed his inability to devote the whole of his time to the waterworks affairs and he tendered his resignation. Buckton was requested to continue his services to the next half yearly meeting of the Company and then to submit his resignation. It was agreed to pay him £50 in addition to his quarterly salary.

For the following six months, Head Office was to be found at the railway offices of Walsall Railway Station in Station Street. Edward Adams designed the building which was similar in style to Lichfield Railway Station but smaller in scale. Historian E.L.Glew writing in 1856, described the 1849 building as an "exceedingly handsome structure in the Elizabethan style, highly ornamental to the town". The station's end in 1978, caused an outcry from conservationists and its demolition was described as an act of public vandalism, extinguishing the last flame of the old South Staffordshire Railway.

On 17th July 1855, it was found necessary, because of increased railway traffic, for the Company to seek temporary accommodation at Darlington Street, Wolverhampton, where an office was rented for £8.00 per quarter, from John Rutter who carried on his profession as a solicitor from the building.

An Assistant Secretary was appointed in December 1854, Josiah Churchill of Wolverhampton at a salary of £250 per annum. He was requested to devote the whole of his time and attention to the disposal of shares.

His appointment as Company Secretary came in February 1855, this minute was rescinded at the Board Meeting in March 1855 as the resignation of J.T. Buckton had not been accepted. At the same meeting Buckton's resignation was accepted and it was resolved that Josiah Churchill be appointed for one year at a salary of £250 per annum commencing December 15th 1854 and terminating December 1855, at which time his term of office was further extended.

Churchill toured the district promoting and pressing the claims of the undertaking on everyone he came into contact with, displaying a peculiar power of persuasion in disposing of shares. He travelled the district by his own horse and trap, the Company paying for the upkeep and feed of the horse, no doubt the first of the mileage allowance recipients.

At a Board Meeting in April 1863 the question of the receipt by the Secretary in 1858 of a deposit of fifty pounds, on a Mr. Lawrence's fifty shares, not being paid over to the Company's Bankers until the 16th of April 1863, was considered by the Board in the absence of the Secretary. The Secretary was then called in and he offered certain explanations of the matter in question. Churchill was then requested to retire to enable the Board to consider the matter. W.V. Houghton the Company's Auditor was instructed to investigate the Accounts since his last audit at his earliest possible convenience. According to the Company's Auditor, Churchill appropriated £308 9s 8d on the Capital Account and £860 on the Revenue Account.

Held in high esteem by everyone, it came as a shock when Churchill was asked to resign as Secretary, having been adjudged of falsifying the accounts of the Company and thereby forfeiting the confidence of the Board of Directors. A warrant was issued for his arrest. Churchill's whereabouts remained a mystery until a letter, dated 17th June 1863, postmarked Spain and addressed to the Company, gave particulars of money appropriated by himself.

In the letter he outlined the discrepancies, quoting from memory, they amounted to £947, the largest of the accounts being £400 from the West Midland Railway Company, £120 from the Wolverhampton Waterworks Company and £53 from the Walsall Commissioners. After discovering the deficiencies he had travelled to Peterborough to visit his wife, with the intention of returning to the office the following week, to inform Mr Houghton the Company's Auditor, of the losses. A Solicitor friend advised him to leave England, advice he later regretted taking. He did not wish to throw the blame on other parties, but felt himself highly culpable in not keeping accurate and regular cash accounts. Had he done so, the deficiencies would not have occurred. Attention was directed at office clerk W. James who took considerable sums of money belonging to the Company. For years he had trusted him to do what he should have done himself. Many sums had been entered in the office diary as cash paid to him by James, which he had no memorandum of, or could he trace in any way. When James had left the Company's employ, Churchill regretted having not acquainted the Directors with the reason for his departure and not taken things into his own hands, a thing he did from kindness to James believing he had revealed all. After repaying sums specified by James there was still a shortage of £400 when he checked the books.

In an effort to balance the books, Churchill tried to borrow money on his life insurance policies and arrange for a loan but following a decision of the Board of Directors the following week, to inform the police and offer a reward for his arrest, it was impossible for him to complete the loan.

He bitterly deplored his folly and asked for an opportunity to return to England to seek diligent labour to recover his position and repay the debt. When Churchill entered the office of Secretary, he was promised commission on the shares he disposed of, a total £550. All he received was 20 shares valued £7 at the time. His salary of £500 per annum had been reduced to £300 and moneys were owed him for office furniture, petty cash and office disbursements.

Five years later, Churchill wrote to a friend in Walsall, asking him to use his influence in an effort to obtain a settlement with the Company. By this time the health of himself and his family was giving cause for concern.

The Company's claim against Churchill was £1,168 9s.8d. His case was taken up by Samuel Wilkinson of Solicitors, Wilkinson and Gillespie of Walsall in September 1869. Furniture belonging to Churchill from his home in Walsall had been sold for him, by a friend in the town, and this realised £300 and Trustees had set up a small fund. They were desirous of winding up their connection with the business. The Solicitors wrote to the Company offering to pay the creditors a composition of three shillings in the pound after obtaining Mr Churchill's authority to do so. Had this not proved acceptable to the Company, it was intended to dispose of the assets some other way.

A meeting between the parties was held in December 1869 when in return for a certified copy of a resolution, with the Company's seal attached, giving Josiah Churchill a complete release, the Company were paid three shillings in the pound on the debt of £1,168.

Anyone visiting Sandfields Pumping Station may be puzzled on seeing a bronze plaque, listing the Company officials of that era, with signs of a name at the bottom of the plaque having been erased. The name erased was Josiah Churchill.

Further office migration occurred in 1856, after negotiations between J. Churchill and estate agents Birch and Rawlings, for use of an office at Castle Chambers, High Street, Birmingham, at a rent of £40.00 per year. The site was chosen for its supposedly central position in the district. Principally, it was more convenient for directors, shareholders and staff.

An inventory and valuation of office furniture at these offices was made in May 1857, by Auctioneer and Valuer, J. Smith.

Clerks Office;	Mahogany office desk, 4 feet eight inches x 7 feet 6 inches with
	brass rails and five drawers. Mahogany table
with three drawers,	Two chairs with
high backs covered in leather.	

Front office; Mahogany desk 4 feet 6 inches x 2 feet 6 inches with a circular front fitted inside and six side drawers, Oak bookstand 4 feet 9 inches long x 1 foot wide, Brussels carpet 14 feet 8 inches square, fender with circular front, Six chairs, mahogany leather, Mahogany chiffonier, Oak office table, the whole valued at £40. 18s. 0d.

Move number four came in February 1859, when it was resolved by the Directors to acquire a more convenient base nearer the centre of operations at Bridgeman Place, Walsall. Previously used as a temporary railway station, the offices were sited opposite the junction of Station Street and Bridgeman Street, adjoining the Walsall Racecourse, and were leased for four years at £40.00 per annum, plus £15 a year for cleaning services.

A second period at the railway station in Station Street came about in the spring of 1863 when more spacious accommodation became available. The Directors of the London and North Western Railway Company, accepted the Company as tenants of the vacant rooms over the Walsall Railway Station Booking Office, on the following terms, £40 per annum, exclusive of rates, taxes, gas, water and coal, the tenant to be responsible for all inside repairs, the same rent to apply for seven years. The accommodation consisted of the Secretary's, Engineers and General Offices plus a Board Room. An inventory of 1864 shows that each office contained a coal fireplace and the floors were covered by oilcloth, the Secretary's office having the luxury of rugs. Each office contained the usual coal fire accessories; fenders, ash pans, scuttle and fire irons. Other items listed include;

Secretary's Office,
wash
Burton W.W. Company.
Large table and table desk, mahogany cupboard, eight chairs, stand, the Common Seals of the S.S.W.W. Company, and the

Board Room,
Three tables, nine chairs, three blinds, two maps.

Engineers Office
Two desks, five chairs, one stool, a measuring chain.

General Office;
safe,
McClellan's drawing board and tressels.
Oak bookstand, clock, five stools, one chair, noticeboard, iron umbrella stand, iron urinal, small stamp lettered S.S.W.W., Mr

The loss sustained by the Churchill affair was finally written off from the profits of the half year ending June 1863, when no dividend was declared.

At about this time 1863, an Area Office was established in Beacon Street, Lichfield, a letterheading announcing this, appears in the record book although no other information has been found.

With the departure of Josiah Churchill in 1863, applications were invited for a new Secretary resulting in sixteen applications together with testimonials being received.

A short list of three was considered. The parties were Charles Tomlinson, late Secretary of Wolverhampton Waterworks Company, Henry S. Chinn of Lichfield and Henry Haselden.

Richard Chawner accompanied by John McClean journeyed to London to see Sir William Clay, the Chairman of the Grand Junction Water Company in the office of which Company Mr. Haselden was employed, to ascertain by personal communication for his opinion of Haselden's qualification to undertake the vacancy.

Harold Haselden, was appointed to the post, commencing his long term of service in June 1863. T.J. Buckton applied for the position he had held previously, his letter of application stated that a person whom he did not get along with, had departed from the Company, but he was not considered.

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John R. Harris is responsible to the Board of Directors for co-ordinating financial, legal, corporate and statutory matters of the Company. This includes direct responsibilities for Personnel, Industrial Relations, Computing and Finance. He is also Committee Secretary of the Consumer Consultative Committee. Prior to joining the Company he received training in a multi-national company, Massey Ferguson Ltd. and was awarded a scholarship to one of the Inns of Court followed by ten years experience in financial and administrative functions of Local Government, and later as Assistant City Engineer (Admin) with Coventry Corporation. Born in Coventry in 1940, he is married and lists his hobbies as rugby, squash and spending time enjoying family life with his wife and five children.

In 1983 the Company were extremely fortunate to be offered a much coveted place on the Advanced Management Program at Harvard University in the U.S.A., John Harris was nominated and sponsored by the Company Chairman and Managing Director to participate in the course.

The Company's progress since its humble beginnings in 1853 was emphasised with the opening of the Green Lane complex. The site was purchased in two stages and contains an area of 8.9 acres. In 1978, an existing single storey,, open plan office building, constructed for Tube Investments Limited, was purchased by the Company and refurbished prior to occupation in 1980. By 1981, operations and technical services, Walsall area office, water quality, safety, some administration and management services staff, together with the control office, central stores and workshops, were established there.

Following the closure of T.I.Sunhouse Limited in 1981, further land was purchased, enabling the Company to carry out further development with the construction of a four storey office block, to house the finance, administration personnel and computer departments, transferred from Sheepcote Street. The Harry Bloomer Partnership were responsible for the design of the building and construction work commenced in March 1983, the contractors being F. and E.V. Linford of Cannock.

On Tuesday 10th April 1984, the new building was "topped out," Mr David Linford, Chairman of Linford Building Ltd. marked the occasion by presenting Company Chairman Mr E.J. Thompson with an engraved water jug. The complex was officially opened on 27th June 1985 by the Earl of Dudley who unveiled a plaque to mark the occasion. The Earl followed a family tradition in inaugurating the Company's works following in the footsteps of his great grandfather. In opening the head office he said "I must praise your Company for its efforts over the years to improve the water supplies in this area. It is quite clear that the Company has always been conscious of its ecological and environmental responsibilities".

Former Managing Director W. Markham switched on the fountain at the front of the building. So, after 120 years in Birmingham, Head Office returned to Walsall, beginning a new era.

First impressions of the cube shaped, four storey building, designed on a medieval principle and built at a cost of three million pounds, suggests a pagoda of reinforced concrete. Its external concrete cladding is faced in brick and each storey is jettied out above the one below on the cantilever principle, which was used in medieval buildings. The construction is crowned with a tiled pitched roof.

The four storey administration block was built on a site where numerous mine shafts and underground workings existed. Advice from one firm of consultants suggested that the project was not viable. In all 148 trial holes and 128 piles down to 17 metres were needed. None of the mineshafts on the site proved to be at the spot chosen for the building, but two different levels of past mining activity had to be encountered. Two thousand tons of concrete grouting mix, were pumped into the shafts before building work commenced.

The new offices are designed to be energy efficient, constructed with a high level of insulation, and are built in the shape of a cube because a cube has almost the smallest surface area for the enclosed volume. The use of energy is controlled by a computer based system which monitors office lighting, heating temperatures, emergency lights, toilet ventilation, outside lighting, fire and security systems, the computer suite's air conditioning and the operation of pumps and boilers in the new boilerhouse. Most of this monitoring goes unnoticed as it senses temperatures in the offices and outside, calculates the amount of heat required by the building and controls the pumps and boilers to provide the right amount of heat without waste. The control of lighting is particularly important as energy is wasted when lights are left on when they are not required.

The system switches lights off in the evenings, after work, and on again at the start of work next morning, but it also monitors outside lighting levels and, as the light outside reaches certain levels, the computer automatically switches off unnecessary lights in the offices.

The Company and the Architects were keen to involve local artists and craftsmen in the visual aspects of the building and following discussions with the West Midlands College of Higher Education in Walsall, Miss Sarah Jones, a student in the Visual Communications Department, was commissioned to produce designs which have been incorporated in glass roundels set in the six windows of the main entrance screen. The designs, engraved on glass by John Ely a glass craftsman from Birmingham, illustrate a particular aspect of the water supply industry; its collection, treatment, and distribution; water in the home; water in industry; water for recreation, and the conservation of wildlife in water.

In front of the main entrance, there are brick walled alcoves and pergolas. At the main entrance itself there is a pool incorporating a water feature which produces varied patterns of flowing and pulsing water. The bronze model of a young girl sits on the side of the pool, to illustrate human fascination with moving water. The model was created by John Bridgeman, retired Head of the School of Sculpture at Birmingham College of Arts and Crafts.

A coveted national energy award was won by the new headquarters in 1986, not only winning in the category "Buildings for Working" the building also achieved the Supreme Award, the first ever given to an office block since 1982 when the awards were first sponsored. At a ceremony in the new Lloyds Building in London on 1st December 1986, David Hunt, M.P., Minister of Energy Conservation, presented the trophies to Mr. J. Carter, Managing Director.

CHAPTER 7

Engineers, General Managers and Managing Directors

The Engineers, General Managers and Managing Directors of the Company since its inception have been able men, intensely active, far sighted, rendering excellent service, putting into effect their policies and inspiring the workforce.

John Robinson McClean C.R. F.A.S. F.G.S.

An expert of distinction, the first of the Engineers involved in the design and construction of the Company's works was assisted by his partner Francis Croughton Stileman and in the period 1852/54 by Henry Marten. One of the originators and first Engineer of the Company lived an extraordinary active business life, much of it spent on projects in Staffordshire including railways, coalmining and waterworks. He was born on 21st March 1813 at Bank Buildings, Belfast the third son of Francis, a Merchant in Belfast, and Margaret McClean.

John McClean attended the Tillicoultry School, furthering his education at Belfast Royal Academical Institute. In 1834 he travelled to Glasgow, continuing his studies at its University. He obtained high honours in mathematics and natural philosophy, pursuing at the same time practical studies in mining, engineering and surveying with the intention of qualifying himself for the Civil Engineering profession. He married Anna, daughter of William Newson of Belfast in the same year.

On completion of his education, he travelled to London taking up employment with Messrs. Walker and Burgess, Civil Engineers, in Westminster, where he acquired the skills of a profession in which he was to excel. His talents were soon appreciated, particularly upon the improvement of the Birmingham Canal where he exhibited great engineering talent and skill.

Walker and Burgess were at that time engaged in several other important contracts including the Thames Embankment fronting the Houses of Parliament, Westminster and Blackfriars Bridges, Commercial Docks and the Thames Valley and Bentley Canals. McClean assisted in preparing surveys and contract drawings, and later became resident engineer on several contracts.

After completing a seven year apprenticeship a colleague persuaded him to become an independent Civil Engineer. Mr. Walker was loathe to lose McClean and tried unsuccessfully to retain his services.

During his first year of practice in 1844, with offices situated at 23, Great George Street, Westminster, he became Engineer in Chief of the Furness Railway. Due to pressure of work in 1849 he took on a partner, Francis Croughton Stileman an engineer who had previously been articulated to him.

McClellan's professional engagements became varied and extensive. Among his earlier important works he was to become Engineer to the South Staffordshire Railway which was built in 1849, serving the areas of Lichfield, Walsall and Dudley. Within six months of its opening he submitted a proposal to the Directors to lease the line, a twenty one years lease being agreed upon. An Act of Parliament was required prior to this being put into effect (13 and 14 Vict. Cap). It was first occasion in history, of the leasing a railway to an individual. In its early years the line ran at a loss and in 1861 it was taken over by the London, North Western Railway. McClellan was compensated one hundred and ten thousand pounds for the unexpired portion of the lease. Profits of the railway for the six months prior to take-over averaged one thousand pounds per week.

Members of the railway staff were compensated by up to two weeks pay by McClellan with the change of ownership.

In 1849, the public press commenced to draw attention to the polluted state of the River Thames, which was becoming full of sewage, whilst several of the London Water Companies then obtained their supply from the river. Engineers were urged by the "Times" to compete for the honour of providing a solution to the contamination problem, and the Metropolitan Commissioners of Sewers invited competition for plans for the drainage of London on both sides of the Thames.

As a result of the advertisement, 116 plans were submitted, although at that time, there was no complete survey of London, and the Commissioners furnished no information to enable competitors to prepare plans. McClellan submitted plans. He had already devoted time designing a scheme for the water supply and drainage of the Metropolis three years previously, when a scheme was brought before Parliament for supplying London with 100,000,000 gallons of water daily from Henley on Thames.

A commission was appointed to consider the London Drainage Scheme designs that were submitted. In 1850 they published their report. In reference to McClellan's scheme they stated it was "The best conceived and most practicable scheme submitted". The plans contained many of the main elements of a sound and judicious system of drainage. None of the schemes however was accepted.

Acquiring the South Staffordshire Railway proved to be a strategic business move in the formation of the South Staffordshire Waterworks Company and the Cannock Chase Colliery Company. McClellan conceived the idea of bringing water from Lichfield to Dudley as the result of attending railway business in Dudley where he refused to drink the water which was supplied by Dudley Waterworks Company, describing the water as disagreeable in taste, smell and colour. In 1851 he became Consultant Engineer to the Dudley Company and designed the scheme to bring water from west of Lichfield to Parkes Hall Reservoir at Woodsetton, Coseley. At this time the scheme failed to gain support through lack of finance.

The idea eventually flourished, the main running alongside the railway line from the City to the town a distance of sixteen and a half miles.

In 1851, he was called upon to advise as to the practicability of introducing the English system of baths and wash houses into Paris, and carried out extensive works at the expense of Emperor Napoleon the Third. He was at the same time employed by a body of English capitalists in reporting upon the means of procuring an additional supply of pure water for Paris.

He became the first Engineer to the South Staffordshire Waterworks Company in 1853. No salary was received but McClean and Stileman received a percentage of all contracts. Without the support of John McClean the Company would have failed in the early 1860's.

Cannock Chase Coalfield provided him with his largest source of income after favourably approaching the Marquis of Anglesey, the principal landowner, a Company was set up to develop the coalfield. A steam engine which hauled coal wagons from Cannock Number Three Pit to Anglesey Sidings, was named after McClean and was in use up until the 1950s.

Other of his West Midland Enterprises included the Birmingham, Wolverhampton and Dudley Railway, renowned for its high retaining walls and a double tunnel traversing Birmingham, and the West Bromwich, Wednesbury and Bilston Railway, opening in 1854.

Railway projects in other regions included the Furnace Railway (Barrow to Lindel and Kirkby), carrying the Furnace Railway Extension Act, Ulverstone to Broughton, through Parliament in 1846, and surveying for the Coniston Railway 1856 and obtaining this Act in 1857. Tottenham and Hampstead Junction Railway followed and his final railway involvement was the Bristol and Portishead Pier and Railway which opened in 1867. Prior to the railway extension Portishead was an isolated village.

In 1855 he was invited by the Viceroy of Egypt to form part of an International Commission, which included Robert Stephenson, to consider the practicability of forming a ship canal between the Mediterranean and the Red Sea, later to be built by Ferdinand De Lessops and named the Suez Canal. During De Lessops' propaganda tour of England promoting the scheme, he was entertained to a public dinner by McClean at the Trafalgar Inn, Greenwich. McClean's plan virtually to form an aqueduct, with locks at both ends, by raising high banks twenty five feet above sea level, along the whole length of the canal course, was debated but rejected at the last minute. It was thought that the banks might burst and that the locks might create traffic delays. The points in its favour was that it was cheaper to build with the aid of railways than to employ labour to dig a cutting.

McClean served on Royal Commissions on the Thames Embankment, Cattle Plague and Railways. He was a fellow of the Royal Society, Fellow of the Astronomical, Geological and other Scientific Societies and presided as a Chairman or Director of two telegraphic companies.

James Walker, his former employer died in 1862 and so created several vacant government appointments which were offered to and accepted by McClean, among which were Engineer to the Harbours of Dover, Alderney and St. Catherines (Jersey), the Plymouth Breakwater, and the Shovel Rock Fort at Plymouth, the works of which had not been commenced. The foundations of this Fort were 40 feet below low water. Most of these positions were held until 1868. Other appointments, too numerous to mention in full, included Consultant to Eastbourne Water and Sewage Works, Consulting Engineer to the Lemberg-Czernowitz Austrian Railway and the South Eastern of Portugal Railway, and had projected railways through the Danubian Principalities, for the purpose of connecting Austria with the Port of Galatz on the Danube, and also with Odessa on the Black Sea.

His involvement with the Institute of Civil Engineers, commenced in 1839 as a graduate, becoming a member in 1844, Vice President in 1858 achieving the greatest honour a civil engineer can attain by becoming President for 1864 and 1865. Hanging in the Lecture Theatre of the Institution is a portrait in oils of McClean, by Charles Landseer. Also in their possession are two busts, one in marble by Wagnmuller and a miniature bronze bust. His term of office as President was marked by the creation of the Benevolent Fund of the Institution, amounting to £26,000.

St. Anne's Church, Chasetown, built in 1865 at a cost of three thousand pounds, was the gift McClean made to the parish, the population of which contained many of the mining fraternity. Edward Adams was the Architect of the church which was built in the Byzantine style. Adams was also responsible for the design of many of the Company's properties. A stone bust of McClean is still contained within the building together with a inscribed commemorative tablet, a similar bust is exhibited at the Company's Head Office at Walsall.

The first incumbent of St. Anne's Church, was the Rev. Donald McClean, the originators nephew. St. Anne's has the distinction of being the first church to be lit by electricity, in 1883. A desk said to have belonged to John McClean, is contained within the church.

Politically, McClean was a Liberal, standing unsuccessfully as candidate for Belfast in 1857. At the General Election of 1868 he was elected along with Mr. Bass, a member of the brewing family, as members to the new division of East Staffordshire, a constituency created by the Reform Act, which contained the towns of Walsall, Wednesbury, Tipton, West Bromwich and Smethwick.

Little can be said of his political life. His business commitments and state of health at this point in his life prevented him from taking an active part in Parliamentary affairs and as poor speaker he declined to engage in debates. McClean's health in the 1870s caused him to retire from active engineering duties. Henceforth he devoted more time to leisure, travelling to Egypt several times. One of his extended journeys, intended to cover India, China and Australia was halted in India where he suffered sunstroke, causing him to return to England. His health never completely recovered.

During the summer of 1873, he journeyed from his home, at the time in Park Street, Westminster, to Stone House, St. Peters, Ramsgate, this being the seaside residence of the Archbishop of Canterbury, Archibald Campbell Tait. The holiday, it was hoped would have improved his health. However, after two weeks there was a sudden change for the worse, so much so that telegrams were despatched summoning his family, who travelled by special train to be present before his death, which came at one o'clock on the morning of 13th July, 1873.

Even in death the railway played its part, his remains were conveyed by train to London, by the Chatham and Dover Railway from Broadstairs Station. He was interred in the private cemetery of Kensal Green, London, where there is a family mausoleum. During his short life John McClean occupied a prominent position in the civil engineering profession with great skill, extreme accuracy, extraordinary soundness of judgement and great foresight. His loss was deplored by a wide circle, McClean being described as kindly, conscientious and generous.

Letters of administration of the personal estate of McClean were granted to his son Francis (Frank) McClean, the estate being sworn under seven hundred thousand Pounds, stamp duty paid was thirteen thousand, five hundred pounds. Frank had joined his father as a partner in 1862. Shortly after his father's death he withdrew from his profession in the enjoyment of a large income. Interested in astronomy he subscribed generously to the advancement of this science.

Francis Croughton Stileman.

He was born at Winchelsea on 25th May 1824, second son of Richard Stileman and educated at the Rev. Dr. Lord's School. He followed this by becoming a student at the College of Civil Engineers at Putney, London from 1840 to 1844.

On finishing his education he was articled to John Robinson McClean at offices at 23, George Street, Westminster, soon acting as Resident Engineer on many of McClean's works. Included in these were, the Dudley and Wolverhampton Railway, the Staffordshire and Worcestershire Canals and the South Staffordshire Railway. Stileman was noted for his smart appearance, and his white silk top hat which he wore on his visits to the South Staffs. Railway Works.

In 1849 he entered into partnership with McClean and shortly after left Staffordshire for Barrow in Furnace where he lived from 1850 to 1853. He returned to London, becoming associated with the, the Furnace Railway, Furnace and Midland Railway Company, Tottenham and Hampstead Railway, Eastbourne Water and Sewage Works, Ryde Pier and Tramways, Bristol and Portishead Railway, Portishead Docks and a system of railways in Galicia and Moldavia. One of his works, for the Furnace Railway, was the enlargement of Lindal Tunnel, originally built for a single line, an undertaking considered unique in its day.

On the retirement of McClean in 1868, he became Engineer in Chief of the Furnace Railways, Harbour and Docks, and Engineer for many large works in Barrow in Furnace including the Corporation of Barrow Waterworks. He also designed and carried out the Keighley Waterworks, Ryde and Newport Railway and Lowestoft Sewage Works Scheme.

F.C. Stileman was elected a Member of the Institute of Civil Engineers in 1855 and a member of the Council for five years from 1884. He was respected and held in high esteem by fellow members.

He died suddenly in his office on 18th May 1889 aged 64 years just one week short of his 65th birthday, having a few hours previously given evidence in an arbitration case connected with the Manchester Ship Canal.

Henry John Marten.

The forgotten engineer of the South Staffordshire Water Works Company was Henry Marten. He had on extremely high reputation in the engineering world and his recognised capacities, led him to be deservedly considered one of the greatest authorities, in this country, on matters connected with the construction of water and sewage works. During the period 1852-1856, although overshadowed by J.R. McClean, he was jointly responsible for obtaining the Act of Incorporation and the design of the Company's early works.

Marten was born in Plaistow, Essex, on the 3rd of February 1827 and was educated at Mill Hill School. Considered singularly quick and bright, at sixteen years of age he was articled to Thomas Wickstead, Engineer to the East London Waterworks Company, a career no doubt planned by grandfather Robert Humphrey Marten, a Director of both the Kent Waterworks and the East London Waterworks Companies. Thomas Wickstead at this time was constructing the Hull Waterworks and the Wolverhampton Waterworks Companies. After a short spell at Hull, Marten, now aged nineteen, was installed resident engineer at Wolverhampton.

Martens ability was such that he soon won for himself a high reputation with the Wolverhampton Directors, so much so, that he was invited to become Engineer, an offer that was accepted with a promise of a right to continue with his private practice. Goldthorne Hill Reservoir in the town, believed to be one of the earliest covered reservoirs in this country, was constructed to his design in 1849. Another early innovation was the introduction of a constant, as opposed to many other authorities, intermittent water supply system.

Marten was elected an Associate Member of the Institute of Civil Engineers in April 1852 and transferred to Member in November 1854.

He was consulted on many water supply works throughout the country.

Still residing and having offices in Wolverhampton, he began to enjoy a large waterworks engineering practice and prior to 1853 was responsible for the construction of waterworks for the towns of Wellington, Salop, Bridgnorth and Stourbridge. He also entered a new field designing a sewage scheme for Bilston, one of the earliest drainage systems undertaken in England.

In 1854 he married the daughter of E.B. Dimmack J.P. owner of Parkfield Ironworks and Colliery near Wolverhampton, and shortly afterwards entered into partnership with his father in law in management of the Parkfield Works. E.B. Dimmack had an association with South Staffs Waterworks Company, being a founder director. At a board meeting of the South Staffordshire Waterworks Company in July 1856 Marten's resignation as Joint Engineer was announced and for the next twenty years, although consulted on many sewage and waterworks schemes, his main interest was centred on the coal and iron industry, frequently appearing before Parliamentary Committees as a witness in connection with these subjects.

In 1875 on the death of E.B. Dimmack, the Parkfield Iron Company, Rough Hills, Wolverhampton, was wound up and Marten resumed his professional career as a civil engineer practising at Storey's Gate, Westminster, London and at local offices in Wolverhampton.

Three years later he was retained on behalf of the Committee of Landowners who actively opposed the Thirlmere Water Scheme of Manchester Corporation and in 1879 was appointed Engineer to the Severn Commissioners an office he held to the day of his death. In this capacity one of his earliest duties was to guard the Commissioner's interest in connection with the proposal of Liverpool Corporation to impound the headwaters of the River Vyrnwy, a tributary of the River Severn.

The compensation clauses which were inserted in the 1880 Liverpool Water Bill, were practically the outcome of his suggestions subsequently regarded as a precedent in similar cases. He was associated with the schemes brought forward from time to time to improve the navigation of the River Severn, increasing the depth from its six feet to ten feet. As Engineer to the Staffordshire and Worcestershire Canal Company, he prepared a plan for improving the canal navigation between South Staffordshire and the River Severn. Marten was appointed one of three Statutory Arbitrators under the South Staffordshire Mines Drainage Acts in 1890.

Amongst the other important works designed and carried out under his supervision included water works for Tamworth District Sanitary Authorities, the Dudley Sewage Works, the West Gloucestershire Waterworks, Tipton Sewage Works and the Tettenhall Sewage Works. He also acted as Consulting Engineer for the Corporations of Wolverhampton, Walsall, West Bromwich, Seisdon and York Waterworks. From 1885 he held the appointment of Engineering Inspector to the Land Commission for England subsequently merged with the Board of Agriculture. He was a Member of the Council of the Royal Meteorological Society.

In 1880, Marten whose first wife died in 1862, married the widow of William Pilkington J.P. of Blackburn and moved to the 'Birches' Codsall, Wolverhampton to live.

He was taken seriously ill in 1892 from the effects of overwork and was advised to take a complete rest, spending three months on holiday in Europe returning home much improved in health.

Henry Marten died at his home the 'The Birches', Codsall, Wolverhampton, on November 3rd 1892 at the age of sixty five years, following a paralytic seizure. His remains were interred in Wolverhampton Cemetery.

The first Engineer in Chief, selected by McClean, was William Vawdry and he held the position for a record thirty years. Joining the Company at a difficult time, due to lack of finance, he was remarkably efficient, managing on a strict budget.

William Vawdry.

He was born 17th April 1840 at St. Day Vicarage Cornwall, second son of the Rev. A.A. Vawdry, vicar for many years of St Agnes in Cornwall. Young Vawdry's education was received locally and on completion, he was found employment at Messrs. Harvey and Company's works in nearby Hayle. This was the nearest town of any importance, where a considerable number of people were employed in engineering, especially steam engine construction. His apprenticeship was spent in the works drawing office, for four years gaining considerable experience in pumping and general steam machinery drawings, followed by two and half years as an engine fitter. Vawdry then spent a short time working for Messrs. Eustace and Son erecting pumping and winding machinery.

During 1862, after passing the requisite examination, he joined the Royal Navy and served as an Engineer on H.M. Ships Cumberland and Conqueror.

On retirement from the senior service in 1864, he made his way to London, living in Chelsea and finding employment with a Mr. Rammel as a designer and supervisor of steam engines and their erection.

In April 1865 William Vawdry wrote to John McClean asking to be considered for the position of Engineer to the Company and surprisingly was successful in obtaining the appointment. At this time he was twenty five years old, with little experience in controlling a labour force. McClean's gamble was a wise one as the next thirty years proved.

In March 1866 Vawdry was elected an Associate Member of the Institute of Civil Engineers and transferred to the class of Member in January 1874.

The waterworks was his life at home and in the office, scarcely absent from duty except for a short holiday each Autumn, when he returned to his native Cornwall, always leaving an address where he could be contacted in case of any emergency. He was a strict disciplinarian who imposed fines on the workforce for a miscellany of misdemeanours, ranging from absenteeism, to bad stoking at pumping stations. Despite this he was well respected by all, from clerk to labourer, for his kind heartedness

He visited the pumping stations, reservoirs and depots on a regular basis, his mode of travel being train or horse and trap. During his thirty years of service he proved himself a most able and energetic promoter of the Company's welfare at a difficult time when there was little finance to expand the works, the Company frequently appearing in court for failure to supply, caused by plant breakdowns and the problem of poor quality water.

William Vawdry was taken ill in September 1894, being confined to his bed at his home 18, Chad Road, Edgbaston, Birmingham. Chairman Frank James requested a daily telegram, reporting on his condition. His death was reported on January 2nd 1895 at the early age of 55 years.

Vawdry is buried at King's Norton Cemetery Birmingham. His epitaph reads, "Blessed are the dead which die in the Lord that they may rest from their labours and their works may follow them". A grant of five hundred pounds was made to his widow Bessie in consideration of his long and faithful service. Vawdry was the Company's longest serving Engineer in Chief, during his tenure of office the population supplied increased from 90,000 to 380,000. All the works carried out between 1866 and 1894 were planned and supervised by him. He created the firm footing other engineers built on.

He was succeeded by an Engineer described as a quiet, painstaking and thoughtful man. Considering all that he undertook, a man of brilliant ideas and of far seeing capacity of management.

Henry Ashton Hill.

The second Engineer in Chief was born at Liverpool in 1852. His father Henry Hill, was interested in gas and water works both as a proprietor and engineer. H. Ashton Hill's education commenced at Cheltenham Proprietary School and finished at Liverpool College.

From 1867 to 1874 he served a seven year apprenticeship in the Liverpool works of T. & T. Vicars where he obtained his mechanical engineering skills. Apprenticeship completed he obtained employment as a marine engineer with the National Steamship Company making several trips across the Atlantic. His next experience was in one of Messrs. Alfred Holt and Company's boats, when he made two journeys as engineer, to the East Indies and China.

On his return from the East in 1876, he applied for an appointment of Gas Inspector, in the Borough and Water Engineer's office of Liverpool Corporation, having been selected from fifty applicants. Ashton Hill's duties were overseeing the Sales of Gas Act and also supervising various contracts with Liverpool Gas Light Company. These duties included testing the illuminating power and purity of the gas and superintending the street lighting of Liverpool. Acting as Gas Examiner, he checked that the gas company fulfilled their obligations to the public under their several Acts of Parliament. During this time he conducted various experiments in connection with the early introduction of electric lighting, drawing up the specification for the first electric lighting contract in the city, with the British Electric Lighting Company. This contract provided lattice poles and overhead wires for the electricity supply.

In 1883 he obtained the appointment of Engineer and Manager of Wallasey Local Board Gas and Waterworks. The district was fairly extensive and included New Brighton and Poulton, overall supplying a population of 180,000.

During his thirteen years at Wallasey he designed and supervised the building of pumping stations, a covered reservoir and a gas works.

Ashton Hill's resignation from Wallasey in 1895 was summed up in the editorial column of the Wallasey and Wirrel Chronical, "It is with mixed feelings that we record the valuable appointment that has fallen to the lot of the Engineer of Wallasey Gas and Waterworks Mr. H. Ashton Hill, in being selected to fill the position of Chief Engineer to the South Staffs Waterworks Company. He has held the office he now resigns for thirteen years, years that have witnessed an enormous development of the departments, over which he has presided, with such signal ability and advantage to the community. The works themselves testify to his ability in the most practical manner. He will leave Wallasey with the best wishes of many friends. It was the best days work that the Gas and Water Committee did to appoint him for he possessed outstanding scientific and technical knowledge".

He moved to Birmingham, residing at 150, Hagley Road, Birmingham in 1895 and commenced his duties with South Staffs Waterworks Company in that year, his first major assignment being the completion of Springs Mire Reservoir. The Ashton Hill period of twenty two years were a consolidation period in the Company's history, including the difficult First World War years with its problems of inadequate supplies, which equalled the difficulties encountered in the 1860's. Much water was required and used by munitions factories which resulted in domestic supplies being curtailed at certain hours per day.

Ashton Hill expressed his desire to retire from the Company in June 1917 by reason of age, probably his last decision in Company matters was to engage woman waste inspectors in May 1917, the first female labour, apart from a cleaning lady employed in the 1880s and onwards.

After his retirement from the Company he acted, to a limited extent, as consulting engineer to gas and water authorities including Parliamentary inquiries.

He was Chairman for some years of the Standardisation Committee of the Joint Committee on Water Regulations and was involved with the Engineering Standards Committee. His other interests included Vice President of Liverpool Geological Society, President of Liverpool Polytechnic Society, Member of the Institute of Civil Engineers, a Member and President of the Institution of Water Engineers and a Member of the Gas Institute. On his retirement he moved to 22, Rave Rd, Boscombe, Bournemouth, he died on 28th of October 1936 at the age of 83 years.

Ashton Hill was followed by an outstanding Engineer and personality who started his long reign as Engineer and continued in office for the next twenty seven years. This without doubt was the expansion period in the Company's history, although funds were available to finance the works unlike the austere Vawdry period when there was a conference to decide how every penny was to be spent.

Fredric John Dixon M.I.C.E.

He was appointed Chief Engineer of the Company on the 1st of August 1917, at a salary of £1,000 per year. A rumour had circulated two years previously, that Ashton Hill contemplated retirement, Dixon presumably set his sights on the appointment at that time and approached the Company for the balance sheets for 1915. In June 1917 he wrote to the company, "On hearing that Mr Ashton Hill is about to resign, I have ventured to assume it is your intention of appointing a successor and with that apprehension, I respectfully beg to submit my application". One hundred and thirty seven replies were considered for the vacancy as a result of advertisements. On his past experience and success Dixon was unanimously elected.

Dixon was born in Worcester on 23rd of December 1869, fifth son of Thomas Dixon, who was in practice as a civil engineer. Young Dixon was privately educated and completed his studies at Hereford College. In 1884 he was articled to his father who at the time was Engineer to the Harrogate Waterworks Company, and for the next four years he gained valuable experience in design and construction of water works.

Between 1888 and 1893 he was associated, as an assistant engineer, with London contractors John Aird & Sons who in their prime years, employed 30,000 men, responsible for building railways and laying gas and water mains. His first appointment was at Lumley Reservoir Works followed by a three year contract on the West Highland Railway from Craigendoran, near Glasgow, to Fort William, covering one hundred miles of the roughest terrain in Britain.

Dixon returned to Harrogate in 1893 as resident engineer under brother Edward Wilson Dixon, on the Beaver Dyke Reservoir, a contract which took two years to complete. From 1895 to 1897 he was Engineer and Surveyor to the Spilsby District Council in Lincolnshire, where he was responsible for administering the maintenance of its five hundred miles of district and main roads.

By 1898 Dixon had decided to enter into private practice as an Engineer with James Thropp M.I.C.E. who was County Surveyor in Lincolnshire, where he assisted in design and construction of bridges, police stations and courthouses, also inspection of road works, surveying rivers, sewers and pumping stations.

Dixon resigned from private practice in 1900 for the purpose of assisting his brother Edward in the preparation of plans, surveys and estimates on two Bills in Parliament for Harrogate Corporation. The works included Scargill Reservoir, Harlow Hill Tower, Roundhill Dam and Tunnel Works and a comprehensive sewage scheme for the whole district, becoming Resident Engineer for the Harrogate Corporation on the sewage scheme after its adoption. On the retirement of his brother as Water Engineer at Harrogate in 1906, he obtained the appointment out of one hundred and forty six applicants.

One other appointment he kept in Harrogate was on 18th February 1892 at Christ Church when he married Mabel, a daughter of John Boddy J.P. of Ganstead Hall, East Riding, Yorkshire.

Fredric Dixon's next move was in May 1908 when he was successful in obtaining the post of Water Engineer to Ashton under Lyne, Stalybridge and Dunkenfield District Waterworks Joint Committee. There were one hundred and sixty six applicants for the appointment. It was a large and comprehensive area, difficult to supply owing to the different pressure zones which extended from Dingle Tunnel on the north, Oldham on the west and Manchester and Salford in the south. Concern about the water quality resulted in Dixon instigating the building of improved filtering systems in the area.

"Mr F.J. Dixon resigns, Waterworks Engineer's new appointment" were the headlines of the "Ashton Reporter" on August the 11th 1917. His resignation was announced at a monthly meeting of the Joint Committee. The chairman stated "I do not know where we should look for a suitable successor, but we will have to make an attempt". Dixon had been their first Engineer.

He commenced his duties with South Staffs Waterworks Company on the 1st of October 1917, at a time when the works were seriously curtailed, due to the war. During his term of office the Company developed very considerably in all directions. Schemes of new works followed one another in quick succession, in 1917 the number of houses supplied was 146,000, by 1943 this had risen to 233,529. The length of mains laid up to the year 1938 was 1,582 miles as compared with 878 miles in 1918. Twelve new pumping stations (nine new sources) were constructed and 13 new reservoirs and towers were built. All this was achieved, despite the war years and a depression in the 1920s, the most eventful period in the Company's history.

Much of the old pumping plant was replaced by more modern machinery and large units of filtration plant established, all of which were designed by Dixon, placing the Company in the first rank of water undertakings in the country. His wide knowledge and experience in presenting Bills in Parliament, to enable the Company to meet demands for increased supplies of water, was invaluable.

In the King's Birthday Honours List of 1943, a public recognition of the services rendered over a long period of years, by Mr F.J. Dixon were rewarded when he was made a Commander of the most Excellent Order of the British Empire.

For many years he resided at "Longdon Lodge", Upper Longdon, near Rugeley and took a keen interest in the parish and represented Longdon on the Lichfield Rural Council from 1928, holding the office of Chairman in 1946 and 1947. Apart from being a Member of the Institution of Civil Engineers he was a Member of the Municipal and County Engineers, a Fellow of the Royal Sanitary Institute, Fellow of the Geological Society London, Member of the American Waterworks Association, the Executive Committee of the British Waterworks Association, the Standing Committee on Water Regulations, the Ministry of Health District Joint Industrial Council not only lauding his services to the council, but setting out his distinguished position as a waterworks engineer.

Mr. and Mrs. Dixon celebrated their Golden Wedding in 1942. There were three children by their marriage, Hazel, Ivy and a son who died young.

In retirement he was able to spend more time with his family although he was retained by the Company in an advisory capacity. Fredric John Dixon died on Sunday June 26th 1949 at the age of 79 years. He was cremated at Perry Barr, Birmingham.

A friend wrote "Blessed with a capacity for undertaking far more work than the average man, Mr Dixon has devoted his time and skill to the betterment of the Company, leaving behind the works which will prove a lasting monument to his devotion to the Company, a source of inspiration to his staff", many becoming distinguished engineers. A plaque to his memory hangs in the Church of St James at Longdon where he was Vicar's Warden for twenty one years.

In all of the newspaper announcements recording his death there appeared a saying, expressing appropriate sentiment or aspiration to any task he undertook, those famous words were, "Do it now".

It was a forgone conclusion that Dixon's very able assistant would follow as first of the Post War engineers, after spending twelve years in the wings as Deputy Engineer in Chief.

Robert Arthur Robertson.

He was born 24th May 1892 in Aberdeenshire. From 1905 to 1910, his general education was received at Robert Gordon's College, Aberdeen, followed by three years engineering study at Aberdeen and Glasgow Universities where he graduated B.Sc. Eng. in 1914. On the outbreak of war in 1914 he enlisted in the Gordon Highlanders. He transferred to the Royal Engineers in 1915 where he obtained a commission, retiring as a Major in 1919.

Robertson returned to Aberdeen and employment as an Engineering Assistant in the Water Distribution Department of Aberdeen Corporation, being responsible for the design on the Invercarnie Reservoir Scheme, in particular the survey and design for part of the twenty one miles aqueduct bringing water to Aberdeen.

In 1921 he applied for and obtained employment as an Engineering Assistant with South Staffordshire Waterworks Company. His first appointment was as Resident Engineer on work authorised by the Company's 1922 Act when the nine miles of twenty four and eighteen inch mains were laid. At the completion of the contract he was promoted to Chief Civil Engineering Assistant, followed by the post of Deputy Engineer in Chief in June 1932.

On the retirement of F.J. Dixon in 1944 he was selected for the senior post, an office he held until his retirement on 31st December 1959. His retirement years were spent in Cornwall. His death was recorded at Liskeard on the 9th May 1982 at the age of 89 years.

Another able assistant Engineer who had waited in the wings followed.

Randall Henderson Taylor.

He was appointed Engineer in Chief on the 1st January 1960 after sixteen years as Robertson's deputy. His civil engineering studies at the Victoria University, Manchester, were completed in 1928 when he gained a First Class Honours Degree. He took up an appointment with Barnsley Corporation Waterworks where, during the next seven years, he gained considerable experience in the design and construction of impounding reservoirs at the Royal Moor and Scout Dyke water supply schemes. After a further two years as Senior Assistant with Messrs. Rofe and Raffety Consulting Engineers of Westminster, London, he joined the Company in October 1937.

R.H. Taylor retired on the 31st of March 1971 after nearly 34 years service. His retirement was spent at Abbots Bromley, Staffordshire. He died suddenly but peacefully at the age of 81 years on 21st October 1987.

The last of the Engineer in Chiefs, prior to a change of title, was appointed to succeed R.H. Taylor on 1st of April 1971.

James Lamont.

Prior to joining the Company, James Lamont gained a comprehensive experience in the administration of large waterworks undertakings which included a water board, local authority undertakings and a statutory water company. He was educated at Stockport Grammar School and Manchester University. In 1938 he joined Lehane, Mackenzie and Shand, contractors to the Derwent Valley Water Board, as an Assistant Engineer.

His next appointment was as an Engineering Assistant in the distribution section of the Metropolitan Water Board. Whilst working with the Metropolitan Water Board he endured part of the difficult London 'Blitz' period during the 1939-1945 war. Transferred as Deputy to the District Engineers of two districts of Central London, including the City of London, the work included maintenance of the distribution system and service reservoirs. When the heavy air raids began in 1940 it was necessary to plan and organise the repair and sterilisation of mains on a large scale. Some idea of the wealth of experience gained at that time, can be obtained from the fact that more than 1,000 mains were damaged by enemy action in the two districts mentioned. In 1942 he voluntarily enlisted in the Royal Air Force, opting for flying duties and receiving his wings in 1943. At the end of the Second World War he became a Technical Assistant at the Royal Aircraft Establishment at Farnborough.

He returned to his waterworks profession in 1945 rejoining the Metropolitan Water Board as an Assistant Engineer in the New Works Section. James Lamont's other appointments up until 1959, when he joined the Company were, Chief Assistant at the City of Nottingham Water Department, Deputy Water Works Engineer & General Manager for the Corporation of Oldham and Deputy Chief Engineer for the Colne Valley Water Company. After joining the Company in 1959 as Deputy Engineer in Chief, he assisted the Engineer in Chief in the development of the River Severn Scheme and was responsible for the design and construction of many of the considerable number of new works including the electrification of Ashwood, Hopwas, Sandfields, Slade Heath, Brindley Bank, Pipe Hill and Maple Brook Pumping Stations, plus the new pumping stations at Cookley, West Bromwich and Wednesbury..

After serving seven years as Engineer in Chief, in 1978 the title was dropped and James Lamont became the first General Manager with a Chief Engineer and a Secretary and Treasurer reporting to him. He retired in on 1st of July 1980 after 21 years service, his retirement years have been spent at Sutton Coldfield.

The foundation of the Company has been it's choice of Engineers, the tradition continued with the last Engineer to hold high office.

William A. Markham.

He joined the Company in September 1958 as an Assistant Engineer and was a senior member of staff throughout a period of growth and technical advance. He was appointed Distribution Engineer in 1960 and Deputy Engineer in Chief in 1971. Following reorganisation of senior staff, he became Chief Engineer in 1978.

He was educated at Bishop Vesey's Grammar School, Sutton Coldfield and attended Northampton Engineering College and the City & Guilds Engineering College where he was awarded the B.Sc.[Eng] in 1948.

His university training was interrupted by the war years, from September 1939 until April 1946, W. Markham served in Europe and the Far East with the Royal Artillery and progressed to the rank of Major by the age of 26, at that time the youngest Battalion Commander in the British Army.

Before joining the Company Mr. Markham had worked for the former Metropolitan Water Board and was its Deputy Resident Distribution Engineer, Eastern Area, prior to leaving.

Mr. Markham took up his appointment as General Manager of the Company on 1st of July 1980 and Managing Director in 1982 when the new position was created. He was responsible for such major projects as the Report to the Monopolies and Mergers Commission, the reorganisation of the management structure and the rapid development of computer applications. He retired on 18th of May 1984 to a new home at Well in Lincolnshire.

A break in tradition which had lasted 131 years, occurred in 1984, when the top appointment as Managing Director was obtained by an Accountant.

James Carter.

His appointment as Managing Director commenced on 12th of May, joining the Company from the Severn Trent Water Authority where he was Divisional Manager of the Soar Division.

Mr. Carter was born in Blackpool, Lancashire in 1931 and was educated locally, completing his schooling at a local Grammar School in 1947. He was found a position with the Lancashire County Council and continued his studies to qualify as a Member of the Chartered Institute of Public and Financial Accountants in 1957.

He completed his National Service in the Royal Air Force in 1951. In 1959 Jim Carter joined the North Western Electricity Board in Bolton as section head covering general accounting, O & M, office mechanisation and computers. Still determined to develop his education further, he combined a day release with evening studies and was successful over the following three years in obtaining an external Degree in Economics of the University of London.

During these years he gained considerable experience in the field of computer technology and this enabled him to acquire his next post with the Eastern Electricity Board at Ipswich in 1961. A Large Centralisation Programme was being formulated by his new employers and Jim Carter obtained his first appointment as Chief Systems Analyst with the task of selecting and installing hardware and related software capable of handling two and a quarter million customer accounts. This massive project completed, he was appointed Head of Customer Accounts in 1965 and Head of Data Processing in 1970.

The move from electricity to water came about in 1975 when he was offered the position of Assistant Director of Finance with the Severn Trent Water Authority, responsible principally for income and charges and for initiating an organisation for the charging, billing and collection of income from over 3.3 million customers. His task at Severn Trent, to introduce and put into operation the Direct Billing Programme, was successfully achieved in just over three years and received favourable mention in the report of the Monopolies and Mergers Commission in 1981.

In 1980 he was promoted to the position of Divisional Manager of the multi-functional Soar Division (Leicester) which served a population of 870,000.

He has lectured extensively at Tadley and elsewhere on the importance of public relations in the water industry, stressing the special need of keeping the public and consumers well informed, in the Company's case, of the work it does and its plans for the future, through press reports, explanatory literature and more recently Public open days.

Living in Leamington Spa, he is married and his family consists of a son and a daughter.

There must always be leaders and outstanding men will no doubt follow to serve with business and technical skills, if John McClean could see the Company today he would confirm the abilities of the men that followed him.

CHAPTER 8

The Company's employees.

Contractors construct early works.

The original works of the Company were carried out by contractors on the recommendation of the Consultant Engineer following the examination of submitted tenders.

Much of the mainlaying was awarded to J. Cochrane of Harts Hill, Dudley who manufactured the pipes but sub contracted the mainlaying part out to John Aird and Son of London, one of the top five contractors of the nineteenth century, who controlled armies of men. During the 1850s, Aird employed 30,000 men on various types of work including railways, canals, roads, gas and waterworks.

John Aird was born in Ross shire, Scotland where his family were crofters, after walking to London to find work as a navvy, he witnessed his father buried alive whilst digging on a canal contract. At sixteen, with a mother to support, he taught himself to read and write and found work with the Pheonix Gas Company and after a few years rose to be superintendent with permission to lay gas and water mains and services, in his own right, a venture from which his great empire started. At one period he held thirty thousand shares in the South Staffordshire Waterworks Company.

Contractor for many of the reservoirs was John Boys Limited of Walsall. A man of no education, John Boys started life in the coal and timber trade followed by undertaking contracts in railway, canal and engineering works.

John Boys completed the building of the South Staffordshire Railway in less than one year. At the height of his contracting work, his wage bill was £3,000 per week. He employed 1,800 men and used 150 horses. Two hundred men, mostly navvies, were used in the construction of Walsall Reservoir.

Resident Engineers and first employees.

McClellan and Stileman employed four resident engineers to superintend the works prior to the appointment of an Engineer in Chief in 1865. Fredrick Harvey was the first appointed in 1856 followed two years later by J. Andrews. John Porter was appointed Resident Engineer in April 1861. His duties included superintending the Company's engines, reservoirs, mains and works of all descriptions, overseeing the laying of services, the execution of all new works and the repairs and maintenance of the existing works. He was held responsible for the distribution system and attended to orders for new services, repairs and complaints. Porter attended all Board Meetings. The last Resident Engineer appointment was J. McGhie in August 1864.

First manual employee of the Company was John Snape, an Inspector, at a wage of two pounds a week, commencing his duties in September 1856. His duties involved the supervision of the contract labour. He was closely followed by Robert Claxton in October 1856, who joined the Company from the Wolverhampton Waterworks Company where he had worked for ten years.

Three more employees who appeared on the wage list over the next five years, were George Uglow, Thomas Perry and Bertram Bayley, all Inspectors.

Henry Bickerton of Lichfield was engaged in November 1858 to protect the Lichfield Reservoirs and Streams at a weekly wage of eighteen shillings. C. Reynolds occupied a similar post at Walsall Reservoir.

The first staff appointment was Thomas Buckton who was engaged as Secretary in 1853. W. James, a junior clerk was the first of the office personnel. He was involved in the mismanagement of Company funds. The secretary at the time Josiah Churchill, insisted that moneys received by James had not been handed over to him. The clerk agreed to terminate his employment conditionally on a reference being made available. Whether James was reinstated after the Secretary's departure, in order to sort out the accounts, remains a mystery but the following letter appears in the record book;

30th June 1863

H.Haselden.

Dear Sir,

Permit me respectfully to tender my resignation as clerk in the office of the South Staffordshire Waterworks Company and also to request that you will kindly procure from the Directors, as early as convenient, a testimonial certifying their satisfaction with the manner in which I have discharged my duties during the (stated) time of my service and that I resign on my own account.

I am dear sir,
your obedient servant,
W.M. James.

William Ross held the junior clerk position but resigned after four weeks, his replacement was James Penn.

Salaried staff in 1865 were the Chief Clerk, J.W. Fisher at £5 per fortnight, William Porter, John Bolton, Henry Macnamara and William Padley, all at Head Office and Storekeeper William Norman at Tipton. Total two week salaries bill for the staff amounted to £16 2s 0d.

First of the Turncocks, based at Wednesbury, were Morgan and Cooper. No Christian names were entered on the wages list. Others who commenced at this early period were John Owen, John Earl, William Darlington and John Hurst.

Permanent turncocks, or watermen to state the modern term, were employed in November 1861 when it was decided by the Directors that a man should reside in each town supplied and that he should be equipped with a bar and key for turning off water supplies. No uniform was provided but hatbands inscribed "Turncock" were to be used. Orders for the day were received at the Depot, apart from walking along the line of the mains laid, the Turncock was expected to make himself familiar with the positions of pipes, valves and other apparatus installed, to search for water wastage and to assist in repairing any burst pipes found.

The following turncocks were responsible for the various districts; Henry Holmes of Walsall, John Ridyard of Wednesbury, Thomas Dickens of Darlaston, William Earl of Brownhills and John Steel of Tipton, followed later by William Brown of Burton and Adam Perks of Dudley. Robert Claxton was promoted, and became the first General Foreman in November 1863.

Turncocks assisted the Collector on his rounds and attended court to give evidence in cases of water stealing, water wasting and illegal connections to the mains.

At Dudley Court in November 1873, William Cyret, landlord of the Golden Fleece Inn, Oakywell Street, Dudley was charged at the instance of the Company with wasting water. John Scott the local turncock said that on the 16th of November the tap in the brewhouse of the premises was running for twenty minutes. He knocked the defendant's front door and prior to the door being opened he heard Mr. Cyret say to his daughter "Go and turn the water off". Whilst the offence was denied, the defendant admitted the tap leaked a little. On Scott's evidence he was found guilty and fined ten shillings or fourteen days imprisonment in default.

Many of the employees engaged, were taken on after working for contractors engaged in constructing the Company's works, William Pill a former worker of James Watt and Company, spent the rest of his life in the Company's employ at pumping stations, mostly Coneygre, and finished as an odd job man at Tipton Depot. William Brown had been employed by John Aird Ltd. An important factor of employment was respectability, loyalty and reliability. Applications were made for jobs following recommendations. Whether anyone was engaged depended on good testimonials being produced.

Richard Morcom wrote for a job from his home in Carharrach, Cornwall in 1865.

I write you this note to say that I will engage with the situation now, if you please to inform me, if I am to come and how and what way I must come. I could come immediately or on the first of July and you would find that I should give you satisfaction as I have done to my late employers.

Yours respectfully,
T.E. Morcom.

Three excellent references were enclosed with the letter, two from Michael Loam and Son of Scorrier describing Morcom as a very industrious, steady, attentive, active, honest, able, well behaved young man. The other reference from John Richard of Clifford Amalgamated Mines, Gwennap, Cornwall, where copper was mined, read;

Thomas Edward Morcom has been working in the engines in these mines from a child, he is now a very able engine man and capable to work or superintend any engine in or out of this colliery. He is an honourable, sober, steady, industrious young man, I do not hesitate to recommend him in the above capacity to any Company or gentlemen who may require his service.

June 26, 1865.

Amongst those who came from other parts of the country, included the Norman family from Baldock, Hertfordshire, Richard Jeffrey from Longton, Stoke, and Frederick Davies, from St. Agnes, Scorrier, Cornwall where he had worked alongside the Engineer William Vawdry.

Engineering and Secretarial Departments Formed.

In November 1861, John Porter suggested that the Company staff should be divided into the Engineering and Secretarial Departments. He reported to the Committee that the Engineering Department consisted of Consultant Engineers, a Resident Engineer, an Office Clerk, two Inspectors of Works, five Turncocks, five Service Layers and two boys to act as assistants. The Secretary's Department consisted of a Secretary, four District Collectors and an Office Clerk.

The committee was of the opinion that this was in excess of the requirements of the Company and wished Mr. McClean to consider and report there on. They also wished him to consider and report on the double up of the turncocks, employed by the Company, being plumbers by trade and competent to deal with repairs arising from leakages within their respective districts.

In June 1863 John Porter, lodged a complaint with the Board of Directors that he was unhappy about his position in the office having to take orders from the new Secretary. In August 1863 the Directors having considered the conduct of Porter, it was alleged that he had quarrelled and given offence to the late and the present secretaries and to contractors, gave him notice that his services were no longer required at the expiration of three months from that day. His salary was £350 per annum.

Pumping station workers.

Early engine workers were presumably paid by the Consultant Engineer, as none are listed in the wage lists until 1861. Earliest of the engine workers at Lichfield, paid by the Company, were Joseph Turner, an Engineer earning two pounds for working a seven day week and William Pill, working as stokers were Enoch Corbett and John Brown at three shillings a day and a sweep named Sutton. Pumping station workers at Coneygre, were J.H. Passfield, engineer at five shillings a day, J. Turner Jnr. and James Evans.

The last named had served his apprenticeship at James Watt and Company, Soho Foundry, Smethwick. Men employed as Stokers included, John Timmins, Henry Smith, and Messrs Hardy and Sutton. During 1864 several workers named as Bushell, Walters, Saunders, Stenson, Lees, Kent, Higginbottom and Tabberer were employed in wheeling and carting slack during a coalmining strike.

Workforce in 1865.

Four members of the Perks family were employed by the Company in 1865, they were the sons of George and Margaret Perks of Portersfield, Dudley.

Youngest of these was David who at ten years old was the youngest person engaged, working as a plumber's boy at a wage of one shilling a day. George Perks, aged 20 years, Joseph Perks aged 14 years and Adam Perks aged 17 years entered the Company's service in 1864 as Turncocks, Adam was considered the brightest and he was soon carrying out supervisory duties until he later became a Plumber, employed in the Dudley District. George and Joseph terminated their employment in 1865. Manual workers at the 11th of January 1865 totalled forty nine and included two mainlayers William and Thomas Martin and Henry Arden a turncock.

The working day started at six each morning, work finished at five thirty at night if there were no problems on the area. A half hour break was taken for breakfast and one hour for lunch. On Saturdays the shift finished at four. Wages were paid every fortnight, a staggering £2 2s 0d. Turncocks had no stated hours and were expected to turn out when called. No extra payment was made for Sunday working unless the work was of a special nature. In these early years, with the long hours of work, it left a bare minimum of time for sleep.

Water rate collection staff.

Earliest of the Collectors were, M. Dickens of Dudley, A. Whitehouse of Wednesbury, J. Horton of Darlaston, G. Whitehead of Tipton, T. Spencer of West Bromwich, J. Green of Oldbury, J. Jennings of Smethwick, W. Meese of Netherton and C. Bassett of Walsall.

The remuneration of the Collectors was paid by cheque, quarterly and consisted of salary and a commission on the sums collected, five per cent on ordinary accounts and two per cent on metered accounts. These accounts were paid into the Company's bankers at the Birmingham and Midland Bank. Collectors also received second class railway fares whilst travelling on Company business and moneys expended on postage and receipt stamps.

Company collectors were required to arrange security by obtaining respectable persons to act as sureties, or took out a policy with a guarantee society who provided security for the fidelity of persons in situations of trust. A stipulated sum was paid per annum to cover any eventuality. One half of the policy was paid by the Company and a half by the collector. Each collector had to provide a surety, some for £1,000, or provide the names of two nominees to guarantee that amount.

Dudley.
June 29th 1863

Mr Haselden

Dear Sir,

In reply to the request of the S.S. Waterworks Company. I beg to propose the following Gentlemen as my Sureties in the above Company Mr William T. Leigh, corn merchant, 19, King Street, Liverpool. Mr Edward Woodhall, Coal Master. Pensnett, Kingswinford. Staffordshire.

Yours Truly,
Mark W. Dickens.
Agent.

The appointment of a new collector, Thomas Rowley at Walsall in 1866 followed the production of the reference to end all references;

Commissioners Clerks Office.
Walsall 23 March 1866

Dear Sir,

In reply to your application for a testimonial, I am directed by the Commissioners to state that they have formed a very high estimate of your character, and much regret that you have been forced to the conclusion that the state of your health requires a change of occupation. You have been in the service of the Commissioners five years, and from this long experience, they unhesitatingly declare you to be, painstaking, punctual and efficient clerk and book keeper and that still higher qualifications of unflinching zeal and integrity have marked your conduct whilst in their service.

Having had, as clerk to the Commissioners, frequent opportunities of observing you, I fully endorse the above and wish you every prosperity and success in any engagement you may make.

I am dear sir,
Yours faithfully,
Tom Wilkinson Jnr.

Collectors worked from home in these early days, and were noted for their dress consisting of top hat and tails. Later they were provided with offices on their districts, these were buildings with ordinary shop fronts painted in the Company's colours and the Company's name announced in gold lettering. Main shops opened every day although rates were due quarterly. For the first week, rates were collected, the second and third weeks were taken up with arrears and book keeping and the fourth week was used for issuing summonses.

Earliest of the offices were established at; 202, Wolverhampton Street, Dudley, Castle Street, Tipton, Bridge Street, Walsall, Market Place, Wednesbury, Alma Street, Darlaston, Church Lane, Smethwick and High Street opposite John Street, West Bromwich. Sub Offices were later established and these premises opened two or three days each week. They were sited in some unusual places including in the Dudley district, Sunday School Rooms, Zoar Street, Gornal, a Chapel at Coseley, room at the rear of Chapel at Sedgley, the Hill and Cakemore Conservative Club and a room in the Magistrate's Court in Halesowen. Similar part time offices existed in other districts. These offices were gradually closed, the Sub-Offices first, followed by the Main Offices in 1962, when all the Collectors moved to the Company's Head Office, Sheepcote Street, Birmingham.

From the earliest times until the 1960s, action for the recovery of water rates was a fairly simple procedure. Lists of unpaid accounts were supplied by district collectors and based on these lists, summonses were prepared by the Magistrates' clerks' staffs and passed on to the police for service. At courts any orders, distress warrants, judgement summonses and if necessary committal orders, were granted and effected by the police.

Many summonses are issued each half year and a considerable number of cut offs for non payment of rates were carried out by watermen. Many of the accounts are settled, once the summonses are issued, with an occasional cryptic note;

"I am surprised by your summons as I have never owed you any money in my life. I have a shilling in the slot meter and every time your collector has called he has found more money in the meter than I have had to pay."

The last word on collectors concerns a visit to a consumer with a warrant of entry to cut off the supply for non payment of the water rate.

Collector knocks the door, which is opened by the consumer. " I am here to cut off the water supply for not paying your water account". The consumer replied, " Bloody clear off or I will turn my hose pipe on you". Quick as a flash the collector replied " Have you a licence for that sir".

A combination of unrelated circumstances in the 1960s, i.e. changes in the law dealing with civil debts and police procedure and closure of the collector's offices, led to the creation of a recovery section within the Revenue Department.

H. Haseldon wrote to the Chairman in July 1869 regarding the need for a new type of Inspector. "At present we have a man at twenty four shillings a week who may be called our inspector, his chief duty being a monthly reading of the meter indicators, but he is not the kind of man we require. We want a higher class of man whom we could trust to make a thorough house to house examination of services, reporting every detail faithfully, giving sketches when necessary and making searching investigations into the sources of supply where our water is not supposed to be used. In this way we hope to bring to book every supply and I do not see how we can make sure of there being no surreptitious supplies, which exist in Darlaston, Wednesbury and Tipton." After referring to the Inspector dealing with water stealers, illegal connections and keeping an eye on local plumbers he added, " It has been suggested that the Collectors should be the Inspector for his own district, but he is fully occupied in getting in the revenue and it is an advantage in having reports from a person independent of the Collector. I propose therefore, at the next meeting of the Directors, asking your sanction to the employment of an Inspector at £100 per year, giving the present man notice to leave and increasing our wage list by £38 per annum only."

Wage rise requested.

A "Round Robin" signed by seventeen turncocks and plumbers, in 1873 requested a sixpence a day rise. The Secretary was empowered to grant an increase or part of it, depending on the special capabilities of each of the men. It was settled with an increase of threepence a day.

Some of the workers were unable to provide a signature for their wages, in these cases the x mark of those workmen unable to sign their names was witnessed by the foremen. Up until 1877 it was obligatory to affix receipt stamps to the receipts signed by workmen for their wages, which at this time were paid weekly. From this time onwards proof of payment through the foreman was considered sufficient.

Movement of labour to other areas.

Men were moved from district to district, even as far away as Burton on Trent. Being away from home for periods, they received a lodging out allowance.

One employee, who was moved around was John Scott, a Dudley turncock from June 1866 until his retirement through failing health in 1895 at the age of 73 years, having been born in Shenstone, Lichfield in 1822. A most respected employee, Scott received half pay for sickness periods, of which there were many during the latter part of his working life. In retirement he was paid a gratuity of fourteen shillings a week, he died in January 1900.

Tied housing.

Some of the workforce occupied houses owned by the Company, some paid rent others did not. The Directors considered that there would be less difficulty in evicting a man not paying rent than one paying. The Secretary was instructed to discontinue charging rent and in lieu of it to reduce the workers wages by a corresponding amount, this was in 1880.

Action taken to prevent accidents.

Safety at work is now covered by Acts of Parliament. After a spate of accidents in 1880, the undertaking became more safety conscious. A letter was sent by the Engineer to all Foremen at depots and pumping stations:-

William Norman, Senior.

Foreman in charge of works generally.

Whenever acting as the Foreman in charge of the Company's work and being the person upon whom the responsibility will rest in case of accident to anyone in the Company's employ, through want of proper care, you must without regards to the trouble or expense of doing so, carefully guard against using any worn out or inferior plant or appliance of any kind in carrying out the work under your charge. All pulleys, chains, girders, ropes, ladders, etc. in fact everything, through defect of which, or want of proper protection an accident might arise or an injury to anyone through failure be caused, must be periodically and carefully inspected and tested and before using you must order and see that those who are about to use any plant, do examine the same and if upon their report you think there is any danger whatever to be feared, such plant or appliances must not be used, but upon application to me, substantial and dependable tools or appliances shall be provided.

Neither must you allow upon any pretence whatever, anyone under your orders to do work of a dangerous character that can by any means being adopted, be avoided.

William Vawdry.
Engineer.
March 3rd 1881.

Employees in 1885.

The numbers employed on 1st of October 1885 were 109 workmen, the amount of wages paid in the year was £8,093 2s. 9d. the highest weekly amount being £227 18s. 9d. on 18th of April when 207 workmen were paid. At this time the average number of hours worked by men on the district was 60 per week, with the average for engine workers at 80 hours, average wage £1.5s. Daily time sheets were sent in each day stating clearly what workmen were employed up on. A summary sheet of all time made during the week was sent to Head Office by Wednesdays evening post each week.

A letter from the Engineer to E. Holden at Hednesford read:-

Why are you using that miserable sticky ink again, your report sheets are nothing but a mass of dirty black marks when I get them and are generally stuck together so fast, that the paper is torn in opening them. Please get some proper ink at once.

Communications, travel and tools.

These were extremely difficult and consisted mainly of contact by letter, telegraph, horse or on foot. Turncocks were requested to watch the level of Walsall Reservoir rise as it was being filled from Lichfield. When it approached a certain level, he ran to the Telegraph Office to wire Lichfield advising them to stop pumping. Other urgent complaints were passed on to the district by telegraph by the Engineer, an example read,

Mason, 58, Bank Street, Brierley Hill.

Go to Holly Hall and see if anything is wrong with the tank.

Vawdry.

One employee's duties in 1892, was to travel on the 7 a.m. train from Walsall to Dudley Port en route for Tipton Depot.

He took with him details of the Walsall Reservoir height, given him by the turncock at Wednesbury and at Tipton was given similar information on the state of Shavers End Reservoir. All the information was placed in a leather bag weighted with lead and thrown from the train as it passed Wood Green Pumping Station. The exercise was repeated at 4.30 p.m. and the information passed on enabled the pumping rates to be regulated.

Telephones were installed at the turn of the century. Head Office telephone number was 912 for Paradise Street, Tipton Office was 26 and later a well remembered number, Midland 0651 for Sheepcote Street.

When it was necessary to repair or lay new pipework, material was carted to the site by handcart or horse and cart. All excavation was carried out by hand with pick and shovel, after using a sledge hammer and wedge to break the top road surface. Workmen lifted the heavy pipework with the aid of ropes and hand winches. Machinery was introduced in 1919 when power rammers and pumps were in use. The first equipment for drilling the water main under pressure was purchased in 1924, this replaced the first service laying equipment purchased in November 1864.

Up until the installation of gas and electric pumping machinery, the survival of the Company was entirely dependant on ample and regular supplies of coal for driving the steam plant. Supplies were brought to stations mostly by canal or rail. Off loading these supplies was a tedious and laborious job which was carried out by slack wheelers using enormous sized wheelbarrows, most of these workers were paid by load. Another unthankful pumping station task was descaling the boilers, work carried out by men using hammer and chisel.

Clothing issued.

Uniforms were issued to certain personnel in 1887 and consisted of a single breasted jacket with brass buttons plus a hard hat. The jacket was replaced every two years, the buttons, and lettering affixed to the collars of the uniform S.S.W.W., being transferred from the old to the new uniform. Overcoats were issued every three years. Trousers worn by uniformed workers were a miscellany of colours up until 1925, when in an effort to remedy the situation they became standard issue. Uniform staff in 1955 were described as nondescript owing to the variety of colours and conditions of shirts worn with the Company's uniform. As the men were in direct contact with the public it was recommended that they be issued annually with two shirts, with three loose collars to each shirt, similar to those worn by the police force, plus either a black or blue tie. Flannel jackets were issued to trenchmen and jointers and other outside staff. At a later date it was a condition of service that certain personnel wore uniform which consisted of suit, shirt, tie, vest and cap, and in recent years safety shoes.

Discipline and court action taken against employees and shareholders.

Sharman was a labourer employed by the Company, cleaning out Minster Pool. In the course of removing mud from the pool bottom, several items of interest were discovered including two gold rings which he refused to hand over to the Company. Instead he handed the articles over to the local police for inquiries as to the true owners to be made. No one claimed the rings, and after refusing to give them to the Company representative, the police returned the rings to Sharman.

The Company's objections were heard in the County Court where the Judge ruled in favour of Sharman keeping the property and from that judgement there was an appeal. The case Sharman versus the Company was heard in the High Court of Justice Queens Bench Division before the Lord Chief Justice, Lord Russell and Mr. Justice Wills in May 1896. Lord Russell ruled the County Court Judge wrong and reversed the decision. Mr. Justice Wills was of the same opinion and stated any decision to the contrary effect would be a great encouragement to systematic dishonesty.

Court action was taken by the Company against Shareholders who were unable to pay calls on their shares and included Joint Engineer Henry Martin and a Founder Director Samuel Holden Blackwell.

Discipline during the nineteenth century was fairly strict although dismissal was restricted to stealing offences. The system worked in several ways, by elaborate part of a days work fine, issued cautions and reprimands or suspension.

1868, Mr Vawdry fined James Steel five shillings for being drunk on duty.

1868, Enoch Corbett fined one shilling for bad stoking at Lichfield.

1871, John Earl absent without leave, fined one day's pay.

1871, John Scott fined one quarter of a days pay for neglecting to report the height of water in Shavers End Reservoir.

An Inspector, W. Darlington, gave an incorrect reading of the meter at a works in Walsall, he was ordered to obtain a correct reading and take his book to Birmingham Office in his own time and pay his own travelling expenses.

John Earl a Turncock was interviewed by William Vawdry in 1881 about his conduct in keeping money sent out in excess of that due to him, in error, for his wages. Earl was told that the error must be rectified and in such a manner that would be a warning to him in future. His wages were reduced to £1.4s.0d.a week, told he was not required as turncock at Wednesbury and that he was required to live near Dudley Port Station to act as turncock or carry out other work in that district, the change to take effect as from the following week.

Clerks were admonished for using penny stamps when they could have used halfpenny ones.

Two of the Company's employees, Henry Arden Jnr. and Thomas Cockerill were committed for trial by West Bromwich Magistrates for stealing the Company's lead while employed in laying main pipes. The Company believed them to be guilty. At the trial however they were found not guilty in the consequence of the evidence of Robert Lawton the Company's assistant storekeeper who said he thought the lead did not belong to the Company. When asked by the Secretary, why he consented to Lawton being called as a witness, at the suggestion of the defendants Solicitor, the Company's Solicitor stated he did not want it suggested in court that he would not call him. After the case, Lawton and the two workmen were ordered to be dismissed by the Directors.

In 1882, a pumping station foreman obtained money by falsely entering a labourer as having been at work for the Company when he was engaged elsewhere. Having admitted his guilt, the foreman was summarily dismissed by the Chairman without being prosecuted

Secretary H. Haselden severely reprimanded H. Holmes, turncock for Walsall for omitting to report an escape of water through a water closet at 39, Goodhall Street, although he knew of the waste for a period of nine months.

These are four of the many letters sent by William Vawdry, to the Foreman at Ashwood Pumping Station in January 1894, to William Norman, Foreman at Tipton Depot in 1888 and a letter to W. Morcom at Huntington, on the Engineers favourite subject, intoxication.

Kingswinford.

Mr. J. Jones,

It is rumoured about Kingswinford and places near, that this Company's Foreman "Jones" at Ashwood, has on several occasions been seen in public houses and on several occasions the worse for drink. Now I am writing you to give you an opportunity, if such reports are true, of at once putting a stop to such practise, for I need scarcely remind you that your berth under this Company, is one to be held only by a man in whom the greatest possible reliance at all times can be placed, and therefor the very first time after this, if I get again any positive proof that you have been found drinking in public houses or met with in a condition showing an over indulgence in drink, you must be prepared to give up your situation without any further notice.

William Vawdry.

June 18th 1888.

Mr. Norman,

I find in your disbursements you have charged 2 shillings for carriage of men's coats to Walsall. I have passed this for payment with the other small accounts but I wish you to understand that this money will have to be refunded by whoever sent this by rail, knowing as everyone does that there are two messengers daily to Walsall as well as carts almost every day.

William Vawdry.

June 18th 1888.

Mr. Norman,

Why were four jointers employed instead of one jointer and labourer on the repair to a three inch main in Mill Street, no less than two jointers, plumber and turncock all of which are charged overtime. I must know about this and although the men are paid the money someone else will probably have to hand back the difference between what it should have cost and what it has cost the Company.

William Vawdry.

P.S If you think it ought to take a day for four men to repair a three inch main I dont.

Mr Morcom,

I am very sorry to hear of J. Brough, when once a man gives way to drink I have no faith in him and as you report this as the second occasion that he has come to work drunk, it will be better to put on another man at once in his place and tell him he leaves the Company's employ at the end of the week.

You can keep him to do any special work for the week, but do not trust him on any account with the boilers, Ryley had better remain at Huntingdon for a time.

W. Vawdry.

A letter to the now extinct weekly periodical "John Bull" in 1912 quoted;

J.F.O. Walsall tells us about "another octopus dividend snatching concern" as he calls the South Staffordshire Water Works Company. "A man has just been thrown on the scrap heap after nearly 30 years faithful service, and, according to information, there are other veterans to follow. This man was discharged without a stain on his character simply because they are cutting down expenses." We really do not see why this unfortunate Company should not be blamed for not keeping up a larger staff than it requires, but at the same time we think they should have already made provision for pensions to their old servants. If the Insurance Act were not a very bad joke, the veterans of the industry would have no cause to regret their dismissal. As it is, men drive engines for 24 hours at a stretch at the week end, 7 a.m. Sunday till 7 a.m. Monday, at scandalously sweated wages.

A humorous moment.

There was some humorous moments, Herbert Jennings wrote from the Marquis of Anglesey's office at Burton on Trent in October 1891;

Sir, re Outwoods Reservoir, I am informed that rabbits have been seen to disappear down the air pipes leading into the above and it is supposed they have fallen into the tank. I feel sure that you wish to find out the truth of this. I notice that in several parts of the town the water from your mains is very muddy.

H.Haselden sent a copy of the letter to the Chairman, Frank James and in one of his rare humorous moments, added the following note;

I send you the letter about the rabbits merely because of the curiosity of it. The irresistibly comic idea of the poor rabbits taking headers down our air pipes and finding themselves in the wrong hole.!

Presentations.

Foremen, later called Managers at the Depots, were well respected and popular figures. On the occasion of the marriage of William Norman Jnr., Foreman at Tipton, he gave a supper for the workmen at the Hope and Barleycorn Inn at Dudley Port, Tipton on 13th February 1885. Mr Norman was called out to an emergency during the proceedings, but was later presented with a silver teapot and a breakfast cruet set, presents from the workmen.

Presentations to fellow employees, on anniversaries of length of service, were initiated as far back as January 1902.

The employees and friends of W. Kirkman, assembled at the Junction Inn, Walsall for the purpose of celebrating his 25 years Company service as, firstly Turncock and lately Manager at Walsall Depot. A dinner was provided followed by the presentation of a marble timepiece, by Assistant Engineer John Bird, as a mark of esteem by the workers, who amidst laughter referred to the many hours spent together at the locations of burst mains.

In reply, William Kirkman said this was a proud moment in his life and he was extremely gratified to receive their good wishes and congratulations. Whilst he had been Turncock he had endeavoured to do his duty to both master and man and as long as he was spared to fill that position, it would be his aim to do so.

Holidays and wages.

Worker's wages were augmented by the one shilling commission paid for obtaining orders for new services. Another perk was the half a crown reward for reporting cases of water stealing. Men were apprehensive about reporting culprits fearing possible reprisals being taken against them by acquaintances of the offenders. Some violence did occur. The Sanitary Authorities on occasions issued orders against owners of property to have a water supply laid on. Acting under an order the Company's men proceeded to the premises of W.Beckley in High Street, Brockmoor, Brierley Hill, in February 1883, for the purpose of laying a service pipe. They were prevented by threats of violence and were forced to leave the site.

One hundred and two workers were on the payroll in 1889 including; draughtsmen, clerks, collectors, inspectors, foremen, engine workers, stokers, plumbers, jointers, paviors, carpenters, turncocks and reservoir attendants. Up until this time, holidays had been limited to one day a year, taken on August Bank Holiday Monday but from this year all men on the permanent staff were granted additional holidays for Christmas Day, Easter Day and Whit Monday.

Many men were employed on a daily basis and were laid off on bad weather days and the days prior to holidays. A shorter working week arrived in 1890 and by 1892 men were allowed to finish work at one p.m. on Saturdays, instead of two p.m. Hours of labour of enginemen and stokers included a twenty four hour shift every alternative weekend until this was abolished in 1915.

Wages at this period were still low, the following letter to the William Vawdry, was sent in March 1893;

Fradley. Nr. Lichfield.

Dear Sir,

I have today received the offer of my old situation in Pachuca, Mexico, therefore I write to ask you if 30 shillings is to be the permanent pay, if it is, I shall be much obliged to you if you will let me know, as I shall accept the offer and go out again. I have now to give my mother 5 shillings a week which leaves me only 25 shillings. I can make no provision for a rainy day out of this for my wife or myself. I am to work under you and feel grateful to you for what you have done for me and our family but for the responsibility, the pay is too low. I shall feel obliged to you if you can let me know as I must send word back by Tuesday morning next. I would not trouble you now in Eastertime but for a speedy reply to Mexico.

I am your obedient servant,
W.J.I. Morcom.

Laboratory staff.

J.W. Cotterill was employed as an Analyst in 1899, reigning supreme and isolated in the upper regions of Paradise Street, Birmingham, until his retirement as Chief Chemist in 1922. It was then the duty of the office boy to do the necessary washing up in the Laboratory.

In 1926 the Laboratory was moved to Lichfield. The reason for the move is now veiled in obscurity. Some of the staff stated that the building of the then new filtration plant at Sandfields, necessitated the Chemist being resident to add to the benefits of scientific control, others stated that the Engineers met in secret conclave and said:-

We are the chosen few,
All others must be damned,
There is no room in Heaven for you,
We can't have Heaven crammed.

The Chemists were promptly banished to Lichfield.

Today the Laboratory is housed within the Green Lane, Walsall Complex, its staff using the most advanced technological equipment available for analysing water samples to ensure the proper quality standards are maintained. Examination of samples may be chemical, bacteriological, or both, plus a smaller proportion of biological examinations. In addition, the Laboratory gives advice on water treatment to the Company's stations and specialist advice to industrial users.

Holidays in 1914 and union membership

Holidays were extended from three days to seven days at this time. Two hundred and twelve workmen were employed by the Company in June 1914. The average wage at that time was £1. 7s.0d a week, the weekly wage bill being £288.

Employees had joined a Union as far back as 1915. A letter was submitted to the Company in April of that year from Mr. H. Simpson, Secretary of the Gas, Municipal and General Workers Society enclosing a demand from the men in the Tipton District for an increase in their wages of three shillings a week.

There was no Union representation for Staff employees at this time. Their advances in salaries were dependant on Civil Service Awards and petitions made to the Board of Directors. Union representation for members of staff was not taken up until 1972 when a branch of the National Association of Local Government Officers was formed.

By 1919 the total workforce had risen to 280, when the weekly wage bill had swollen to £936 giving an average wage of £3.6s.6d. This wage was to increase by 6s.6d. a week in the following year.

During the Great War years, 1914 - 1918, the Company made up the difference, between the Army pay and allowances to dependants, and the full weeks pay based on the pre war rates of pay, for all Company men serving in H.M.Services. A shortage of manpower resulted in men working considerable overtime, men were also recruited from other parts of the country.

Mr William Parker,
The Bungalow,
3, Victoria Street,
Darwen.
Lancashire.

Dear Sir,

Maple Brook - Position as Foreman.

someone
your

In reply to your letter of yesterday's date, I am glad to hear you accept the position. Take a North Western Railway ticket to Lichfield (Trent Valley) Station; you had better bring your bicycle with you and I will arrange for to meet you, if you will give me the time of arrival at the railway station. It would be better for you to come alone and take lodgings for a few days, then wife and children can join you while your furniture is being removed.

Yours truly,
H. Ashton Hill.

In 1921, 326 appeared on the payroll and the same year there was a reduction in wages under the Joint Industrial Council Regulations of one and a half pence an hour.

In common with most of the larger industries of the country, the water industry had its own Joint Industrial Council, one of its objects of which was the fixing and control of wages. The Council was composed of members of the employers side and representatives of the workmen.

An elaborate scheme for manual worker's wage fixing was formulated by the Council in July 1921 which since its inception was altered and adjusted to meet new conditions as they arose from time to time. The original scheme provided that the hourly rate of pay was increased or decreased by one half penny an hour for every six full points by which the average cost of living for three months, rises above or falls below 146 per cent over the pre war cost of living. These revisions were based on the index figures of the cost of living as published in the Ministry of Labour Gazette and revisions were made each three months, variations being based on the previous three months index figures.

This scheme operated until February 1933 when a new basis of adjustment was adopted to meet the altered conditions. This new scheme fixed the rates of pay, then in operation, as being on the basis of a cost of living figure of 46 per cent over the pre war cost of living. The real effect of this new scheme was to stabilise wages whilst the average cost of living figure remained between 37 and 49 inclusive. If the figure dropped to 36 the rates were reduced by one half penny and if it rose to 50, rates were one farthing per hour higher.

The revisions under this later scheme were made half yearly as against quarterly under the original scheme. In addition to the control of wages the Joint Industrial Council decided on conditions such as holidays and overtime and other things affecting the welfare of the workforce

Average rate of pay in 1931, for manual workers was 1s.2d. per hour, the Area Superintendent received £6.10s. 0d. a week salary and an Inspector £4.2s 6d.

Hours of work and holiday entitlement from 1937.

During the late 1930s and the Second World War years the normal working week was 47 hours, 7.30 am. to 5.00 pm., Mondays to Fridays, one hour lunch and 7.30 to noon Saturdays. Holiday entitlement was 12 days with pay including recognised Bank Holidays. Employment was subject to 7 days notice either side. During incapacity for work in consequence of sickness, having completed ten years service, sick pay was paid for the first three weeks of the illness followed by half the amount for the following three weeks but the Company was sympathetic in most cases in extending the payments.

I.D. cards issued.

Identity cards with photograph and properly certified endorsements were issued to employees, not engaged on enclosed premises, for the first time in 1940, although pass cards for permission to walk along the railway track were issued many years previously.

Conditions of service served on watermen.

Included in the Waterman's condition of service were these two clauses:-

You must deal promptly with all instructions given to you by your Superintendent or his representative and with all messages given to you or left at your house by members of the public and others, eg., Police, National Fire Service, etc. When it is necessary for you to deal with Company matters after ordinary working hours as defined in Clause 1, you must do so without demur, and overtime will be paid in such cases. You must always leave word at your house as to where you can be found in case of emergency, and when called, you must give prompt attention to the necessary duty.

You must always observe the conditions of clause 4 of the Conspiracy Act 1875 an abstract of which is posted up at the Company's Depots and Pumping Stations, this read;

38 & 39 Victoria, Chapter 86, Section 4.

For amending the Law relating to Conspiracy, and to the Protection of Property, and for other purposes. 13th August 1875.

Breach of contract by persons employed in supply of gas or water

4 Where a person employed by a municipal authority or by any company or contractor upon whom is imposed by Act of Parliament the duty, or who have otherwise assumed the duty of supplying any city, borough, town, or place, or any part thereof, with gas or water, wilfully and maliciously breaks a contract of service with that authority or company or contractor, knowing or having reasonable cause to believe that the probable consequences of his so doing, either alone or in combination with others, will be to deprive the inhabitants of that city, borough, town, place, or part, wholly or to a great extent of their supply of gas or water, he shall on conviction thereof by a court of summary jurisdiction or on indictment as herein after mentioned, be liable either to pay a penalty not exceeding twenty pounds or to be imprisoned for a term not exceeding three months, with or without hard labour.

Every such municipal authority, company, or contractor as is mentioned in this section shall cause to be posted up, at the gasworks or waterworks, as the case may be, belonging to such authority or company or contractor, a printed copy of this section in some conspicuous place where the same may be conveniently read by the persons employed, and as often as such copy becomes defaced, obliterated or destroyed, shall cause you to be renewed with all reasonable despatch.

If any municipal authority or company or contractor make default in complying with the provisions of this section in relation to such notice as aforesaid, they or he shall incur on summary conviction a penalty not exceeding five pounds for every day during which such default continues, and every person who unlawfully injures, defaces, or covers up any notice so posted up as aforesaid in pursuance of this Act, shall be liable on summary conviction to a penalty not exceeding forty shillings.

An original framed copy of this abstract can be seen at the Company's Museum at Brindley Bank.

Telephones were installed in the watermen's houses and a condition of service was that he must receive messages and instructions over it and take the appropriate action, keeping a record with dates and times of all messages, both incoming and outgoing.

Rates of pay in the 1940s.

All grades rates of pay at this period were one penny an hour above the minimum rates for the industry. During 1942, labourers, stokers, waste inspectors and engine and boiler cleaners were paid 1s.6d. per hour, jointers and watermen 1s.8d., lead pipe jointers 1s.9d. and engine tenters 1s.7d

Wages for the plumbers, mainlayers and turncocks in 1943 were an average of £4.6s.0d for the 47 hours. Due to the shortage of labour, many were working up to 70 hours each week, overtime rates of time and a half for Saturday afternoon and double time Sunday were being paid.

The 40 hour week came into being in 1960, Saturday morning working, except for emergencies became a task of the past. Today the normal working week has been further reduced to 38 hours, with an holiday entitlement of 25 days.

By 1952, Company employees numbered 946. In 1963 the number had increased to 1,063, the highest number in the Company's history. From this time the numbers have decreased to 667 in 1987 and 590 in 1989.

Long service employees.

Joseph Porter, son of John Porter the Resident Engineer, who started work as a clerk in 1862 and rose to the position of Collector of the Dudley, Kingswinford and Cradley District, retired in 1913 becoming the first Company employee to complete 50 years service.

When H. Grepe resigned his appointment of District Superintendent of the Cannock District in May 1923, he had established a record of service, 52 years, in the Company's employ. At the time he was 69 years of age and had been Superintendent for 45 years. This was equalled twenty six years later when George Downing, Turncock for Kingswinford completed 52 years service and retired in 1949, on the grounds of ill health aged 70 years. .

G.R. Warren, Storekeeper at Wood Green, retired in October 1950 after 51 years service, aged 65 years but unfortunately he died three months later.

Howard Shelton, Head Office, retired after completing fifty years in 1947. H. Stamps of the Meter Department completed 50 years service as did Geoffrey Guy, Chief Clerk at Tipton who commenced November 1925 and retired on July 28th 1975. George E. Hick, ganger at Burton, completed 50 years service in 1947, aged 67 years. J. Plant completed 50 years service in 1936 as did E. Round in 1951 and Bert Spink, an employee at Wood Green . F.W. Brownjohn retired in November 1968 after 50 years service. He started as an office boy at Walsall in September 1918.

The longest serving female employee was Miss Margaret Brawn, who commenced working for the Company on 24th of September 1917 and retired 7th April 1966, after 49 years.

Other long serving female employees were Mrs. J. Hale, a cleaner at Tipton Depot, who retired owing to ill health, after 46 years with the Company, Mrs. R.M. Jones the cleaner at Cannock with 46 years, Miss C.J. Lowry, former Receptionist at Head Office, retired in May 1962 after 41 years and Miss Claire Parry, who retired in 1973, after completing 40 years service.

Other employees who just missed the fifty years included; Howard Beardsmore, retired 1962 with forty nine and a half years service, W.H. Baker, who joined the Company from West Cannock Colliery Company in November 1881 and retired as Foreman at Ashwood Pumping Station in December 1930, 49 years service, Fred Sawyer, 49 years service, F.S. Ward, who retired in 1966, after almost 50 years, J.S. Tucker, mains and service jointer at Tipton, retired 1923 after 48 years service, aged 72 years, R. Chamberlain, 48 years service, E. Jones, Area Superintendant Tipton, retired 1976 after 48 years, F. Grepe, inspector at Tipton, retired 1923 after 47 years service, aged 65 years and O. Round retired in 1964 after 48 years service. W.H. Smith, clerk in the Service Laying Dept., retired in 1947, after 47 years, aged 61 years. I. Guest, Tipton, retired in 1939 after 47 years service.

Employees with 40 years service or over, contains a list too long to record, although many of the early employees, included periods of broken service or time spent in the forces during the war years. Since 1960, there have been many recipients of gold watches, presented to employees, on reaching twenty five years service.

Family tradition of father, followed by son and a continued prevalence of family connection existed for many years and does to some extent at present. Whole families worked for the Company at the same time and included the Smiths, Porters, Duffields, Kirkhams, Morcoms, Garners, Normans, Reeds, Guests and Tappers, plus many more, some aggregating over 150 years of service by families.

Annual retired member's outings.

A retired members annual outing is held each year. The first of these was held in 1956 when 100 guests were taken to visit Blithfield Reservoir. This has been a successful venture. In 1980 seven coaches transported 330 retired members and their guests to Broughton Castle near Banbury, this being the twenty fifth Special Outing. In 1987 the venue for the event was Malvern, this year 1989 over four hundred retired employees which included their guests, visited Gloucester Docks.

Formation of the Staff Association.

In 1920, a suggestion was made that a Staff Association might be formed, the idea was enthusiastically received and following a staff meeting on the subject, representatives were appointed to ask for an interview with the Directors. H.K. Beale the Chairman agreed to meet the deputation. After the objects of the scheme had been discussed the Chairman gave his support, accepting the Presidency thus assuring the success of the Association. The main features of the Staff Association were the Annual Dinner, Outing and the Visit to Works.

A Special General Meeting of the Staff Association was held in October 1976, proposing a change in the rules and objects of the club. The first resolution altered the name of the club to the South Staffordshire Waterwork's Company Social Club. The distinctions between staff and employees was only a matter of how often one was paid, monthly or weekly. The Social Club was opened up to admit both staff at Head Office and district employees.

The Company's Superannuation Scheme.

John S. Bird retired in March 1925 after 47 years service. He was the first Chairman of the Staff Association Committee and a leading mover in bringing the superannuation fund into being.

The Directors decided in 1923, to make provisions, by means of a superannuation fund, for the members of staff who retire by reason of age or infirmity. Powers to subscribe to such a fund were obtained in the 1922 Act of Parliament and the Directors allocated a sum of £10,000 to form the nucleus of such a fund. Up until this time, a retiring allowance was given to employees, during the Board's pleasure, depending on number of years service.

A petition, signed by A.E. Douglas and the Chief Clerk on behalf of employees, had been submitted to the Directors in 1911, requesting the inauguration of a Superannuation Fund but the matter was postponed until the Government Act for Insurance and Sickness had assumed definite form. Six months later, the Chairman and Solicitor, in their reply stated that a Statutory Company had no power to establish a Superannuation Scheme without special authority and no special authority was contained within the Company's Acts. It was therefore necessary to apply to Parliament with the previous sanction of the Shareholders, if the Board decided to advise them, to undertake the serious obligations of such a scheme, for which as applied to a Company of this nature, they personally knew of no precedent.

The staff replied by asking for a clause to be inserted in the forthcoming Bill to be presented to Parliament. The matter was postponed for further discussion by the Board. An unfavourable reply to the petition, followed a Board meeting in October 1912. The Directors decided it was an inopportune time to bring the matter to the attention of the Shareholders or to insert a clause in the Parliamentary Bill. The scheme affected only the staff in the Secretary's and Engineers Department they being the only persons employed who could claim exemption from the provisions of the National Insurance Act 1911, if entitled to the benefits of an approved scheme. The deciding factor against the scheme was the Company's contribution, estimated at £1,200.

The numbers affected by the suggested scheme, included 96 men under 40 years of age, earning a total of £7,620 per annum, 43 between the age of 40 to 50 years, earning £5,334, 47 aged between 50 and 65 years earning £6,004 and 9 men aged between 66 years and 75 years earning a total of £1,312 per year. These workers included, Officials, Collectors, Clerks, Draughtsmen, Inspectors, Foremen, Engine Workers, Stokers, Turncocks, Meter Readers and Reservoir Attendants. Left out were Plumbers and Labourers. Contributions to the scheme were on a sliding scale, dependant on age, between 3 and 5 per cent, giving a total contribution of £742 per annum.

In September 1922, John Bird, asked in a letter to the Board, for their consideration of a scheme at a future Board Meeting, whilst not committing themselves the Board asked for a suitable scheme be prepared for their consideration.

Actuaries considered the report in November 1922 and a draft scheme was drawn up, after discussion by the Board it was agreed;

1. That a Superannuation Scheme be established from 1st of July 1923.

2. First trustees of the fund be Hubert Kenrick Beale, John Archibald Kenrick and William Worthington Worthington.

3. That Ernest Charles Keay, John Archibald Kenrick and Joseph Edward Willcox be appointed the first members of the Committee of the Scheme to represent the Board.

4. That authority be given to affix the Company's Seal to the declaration of the trusts relating to the scheme.

One of the first recipients of superannuation was S. Rogers who retired in September 1924 after 46 years service.

In 1974 the Company's fund became a closed fund and members were given guarantees of its continued viability. All employees joining the Company after this year entered the Water Companies Scheme.

Legislation in 1978, required that at any time there should be sufficient funds to meet liabilities. Because of its closed nature this requirement could not be met unless the Company was prepared to inject into the scheme a capital sum of approximately five million pounds.

In view of the rapidly diminishing membership of the South Staffordshire Waterworks Superannuation Scheme by 1984, 301 employees compared with 416 in the W.C.A.P. Scheme, a costing exercise was carried out by consulting actuaries to compare the costs of continuing the independence of the Company's Fund or merging with the Water Companies Association Pension Fund. As a result the Company's fund was amalgamated into the Water Companies Superannuation Scheme in 1986. There was no detriment to benefits or increase in employee contribution rates after the merger took place.

The Widows and Orphans Fund, the Mutual Thrift Fund and the Benevolent Fund inaugurated in 1926.

The first named was managed by the same committee as that of the Superannuation Fund. Contributions were made on a graduated scale ranging from one and a quarter per cent to two per cent according to age and salary of the member, the Company contributing each quarter an equal amount as paid by the contributor. It enabled the members of staff to have assurance that their dependants were provided for, should they be unfortunate at death to leave a widow or children. A change in benefits of the Superannuation Fund discarded the need for such a scheme at a later date.

The Benevolent Fund was confined to members of the termed "outside staff" employees away from head office. Contributions to the fund were at a rate of 2d. a week, objects of the fund were to provide added financial assistance to members in times of sickness and distress.

A grant of 10 shillings a week for eight weeks during illness was made, plus distress grants up to £5, death benefits of £5 and assistance was given to members for hospital notes.

Launch of Company magazine.

A Quarterly magazine named The Review was launched in January 1933, the first issue, under the editorship of A.E. Bullivant. Printed on high quality paper, it included reports of a general nature, adverts, articles and photographs. A charge of one shilling a copy was made and the periodical was intended to bind the Board, Management and Staff closer together and used in keeping all informed in matters of interest to water undertakings generally and matters of a more domestic character, recording the numerous activities in the life of the Company. In 1947 the Executive Committee of the Staff Association Club suspended the publication of the original Review. The expenditure incurred in producing the previous four publications amounted to £131 whereas the income derived from its sale was only £53.

In 1947, Mr C.H.F. Gilbert tried to continue keeping the Company's staff informed in matters of common interest by the publication of a periodical newsletter which he named "Main Topics". Owing to the lack of contributions and financial support he was obliged to abandon his efforts after only two issues.

Numerous requests from the employees resulted in the Staff Association approaching the Board of Directors in 1950, to finance a free copy of a quarterly news letter to all employees of the Company. The first copy of "News Review" was published in February 1951 and it has been published in various forms up until today, as a free periodical, financed by the Board of Directors.

Sporting and social activities.

From the earliest days, the Company has encouraged its employees to participate in sporting and social activities of all kinds. Social activities such as Annual Dinners, Annual Outings, Visits to Works, Smoking Concerts, Whist Drives, a Musical Society, a Debating Society, Educational Lectures, Tobacco and Chocolate Clubs formed in 1926 and a Library inaugurated in 1934. In more recent years Social Clubs existed at Depots and Head Office. The Annual Bonfire Night, an Annual Knockout Quiz, Annual Outings continue and the Christmas Dinner and Dance successfully held at Sutton Coldfield Town Hall continue, together with Garden Club Outings.

A South Staffordshire Waterworks Football Club was formed by the clerks in 1896, Secretary was Charles Pettitt and Frank James was invited to become President.

Football and cricket clubs from the Company played matches against Birmingham Water Company in 1898, a balance sheet shows that Directors, Engineers and Collectors contributed to the funds.

South Staffordshire Water Works Football Club
Balance Sheet Season 1898-9

	£ s d		£ s d
New football shirts	9. 0	By balance brought forward from season 1897-8	4.19. 2
Postcards, Stamps & stationary	10. 0		
Expenses in connection with smoking concert	15. 4	Subscriptions received as follows	
Expenses of cricket Matches	11. 3	William Evans, Esq.	1. 1 .0
		M. Lindner, Esq.	1. 1 .0
		H. Haseldon, Esq.	1. 1 .0
Entrance fee & deposit Tipton Medal Competition	5. 6	F.H.Lloyd Esq.	1. 0 .0
		H. Ashton Hill, Esq.	10. 6. 0
Advert in "Argus"	5 8		
Expense of Players	10. 9	from S.S.W.W. Tipton	
Referees expenses	7. 4	A.E. Douglas, Esq.	5. 0
		J. Porter, Esq.	5. 0
Goalkeepers gloves	4. 6	F.W. Davies, Esq.	5. 0
Three telegrams	1. 9		
Expenses; Ground etc in connection with match against B'ham Water Works	4. 0		
Sundries	8.11		
		Balance in hand	5.13.
	10. 7. 8		10. 7. 8

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Audited and found correct.

C.H. Turley
J.S. Bird Auditors.
28th September 1899.

Many sports clubs have been formed within the Company including, rugby, cricket, tennis, fishing and one other predominant sport, table tennis. Two table tennis trophies were competed for, the Fred J. Dixon Trophy for a singles handicap competition and the H. Kirk Trophy for a scratch competition.

On occasions during the 1930s a Company sports day was held but for unknown reasons this was subsequently discontinued. At one meeting the mile race was won by A. Clarke of Sutton Coldfield in 5 minutes 34 seconds and the long jump event by W. Webb of Sandfields who cleared 17 feet 8 inches. Not all the events were serious competitions, they included a slow bicycle race, musical chairs, a ladies paper race and a tug of war, the victors of which were Walsall Depot.

Ex-servicemens social events.

Following the First World War, two dinners were held, in 1932 and 1933, to honour the 1939-1945 Ex-Servicemen and Ex-Sevicewomen, a Dinner was held, at the invitation of the Company's Staff Association Club, in December 1947 at Head Office, Sheepcote Street, Birmingham.

One hundred and eight of the Company's employees, volunteered or enlisted in H.M. Forces during World War Two. Of these there were an unlucky thirteen who did not return. Major A.H.S. Walters unveiled a plaque containing the Roll of Honour, listing the following names;

Gilbert Bayley,	Head Office. (Accidentally killed.)
Robert Bayley,	Head Office. (Killed on active service.)
Edward Brunt,	Burton. (Missing, presumed killed.)
Lawrence W. Garfield,	Head Office (Killed in flying accident.)
George A. Garford,	Tipton. (Missing presumed drowned.)
Stanley B. Goddard,	Laboratory. (Killed in action.)
John.T. Gregg,	Hinksford. (Missing presumed killed.)
Wilfred.H. Hill,	Head Office. (Died as a result of enemy action.)
Peter F. Nixon.	Head Office. (Missing, presumed killed.)
Fredrick C. Ray,	Tipton. (Killed in action.)
Arthur F. Vaughan,	Head Office. (Killed in flying accident.)
George H. Ward,	Slade Heath. (Died on active service.)
Francis R. Wilkes,	Tipton. (Killed on active service.)

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Transport policies.

From the commencement of the Company's operations, canal boats, railways and horse drawn vehicles were very much in evidence for the carriage of coal, pipes and other materials. Workmen and staff travelled the district on foot, tram or train, railway season tickets were

provided for certain inspectors. Hand carts were provided for carriage of plumbers and mainlaying materials and equipment.

A letter was sent to W. Norman from the Engineer asking him to explain the charge, in his disbursements, of one shilling a day tram fares for one of his workmen, travelling from Kingswinford to Dudley in 1903.

One of F. Dixon's first reports, on his appointment, referred to the Company's transport policy. In 1917 there was great difficulty in hiring, and an increasing cost of purchasing horses. Hiring rates for the horses, which were in short supply because of the war effort, forced the Company towards adopting mechanical traction. On the question of carriage of materials, Dixon's scheme, submitted to the Board, recommended the introduction of mechanical traction which he considered more economical and efficient than the horse drawn vehicles. As the majority of the coal slack contracts were let to colliery companies at an inclusive price, including haulage, at most stations it was cheaper to continue this method. Four stations could be dealt with without injury to existing conditions, where it would be cheaper to haul slack. He suggested the placing of immediate orders for the purchase of two, five ton steam wagons for use at Morse Gorse, Maple Brook. The fuel to these sites was carted by the Company from colliery wharf, and at Bourne Vale and Shenstone, the slack to these stations was carted from the railway station. The estimated amount of slack and ashes carted from the four stations was fourteen thousand tons per annum. The last load of coal hauled by a steam lorry, on the Company's area, was to Maple Brook on 30th of December 1933.

The engineers previously used the railway or hired pony and traps, Dixon recommended that a second hand car should be purchased for the use of the Directors and himself. In 1918 the first company car was purchased second hand, an A S & C Humber, registration number OB 6657, which was replaced in 1921 by a Price Equator Crossless Sunbeam car.

The first of the heavy vehicles were two Napier Steam wagons, at a cost of £340, which were purchased in 1919, closely followed by two Ford motor lorries.

By 1925 the transport fleet had grown to two steam lorries, seven motor lorries, two cars and a Triumph motor cycle OK 1979, and during the next six years the first of the light vans, a Morris joined the fleet.

Bicycles were used by watermen and waste inspectors. The first of these was issued in 1925 when a weekly allowance of 1s.6d. was allowed to users for maintenance.

The word " bicycle" was taboo to the early Engineers and when Ashton Hill received a request for this form of transport from a Turncock, he replied to the effect that no burst mains are found on a bicycle. A Raleigh cycle, at a cost of £6, was purchased in 1937 for the use of the Superintendent at Sandfields. Bicycles as a form of transport were withdrawn around the 1970s, the last new one having been issued in 1965.

Included in the transport fleet in 1932 were 13 cars, 10 lorries and 4 vans. Subsequently the numbers increased but the majority of vehicles virtually fell apart, or had mileage readings of 150,000 miles, prior to them being renewed.

A one ton Morris lorry stationed at Cannock, purchased in 1924 for £214, was in 1935 declared beyond repair, having covered 167,000 miles. It was replaced by a two ton vehicle at a cost of £240.

Vehicles listed as owned by the undertaking in 1953 numbered 78;

12 Austin A40 vans and pick ups, 12 Austin 2 ton and 5 ton lorries, 1 Jowett van, 15 Austin A40 saloons, 1 Austin Princess car, 4 Bradford vans, 2 Fordson tractors, 7 Austin 25 cwt. vans, 1 Humber car, 1 B.S.A. motor cycle, 8 Norton motor cycle combinations, 6 jeeps, 1 Austin 6 H.P.car, 2 Morris vans, 2 Morris lorries, 1 Ford Prefect car, 1 Morris car, 1 Ford 3 ton lorry. Today's transport fleet consists of 276 vehicles which include, 90 vans, 67 lorries, 9 heavy lorries and 74 cars mainly of the British Leyland design and manufacture. Although the Depots each have a transport section the main centre since 1978 has been at Bridgeman Street, Walsall.

The Company's workforce has changed considerably both in size and character since its beginnings. It would be an impossibility to list the large number of employees who have rendered invaluable service but they and their teamwork can be seen in the ultimate success of the Company. This tradition continues but the significant factor of the age is change, these include the customers perception and interest in the range of services provided, in methods of working and in the technology and equipment used to carry out the work. Watermen, plumbers, service layers, inspectors, clerks are still on the pay roll as in 1865 but the predominant theme is the increased use of advanced technology and automation, which will no doubt lead to a consequential reduction in manpower.