Public Health and Water Supply in Bridgwater, Somerset

by Tony Woolrich

8) The Bridgwater Waterworks 1900-1939

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Urban and Rural

THE predominant theme for the next thirty-nine years was a constant battle to match inadequate supply with greater demand and the increasingly close cooperation between Bridgwater Urban and Rural Councils to achieve this. The two services remained separate, with two water committees and staff, notwithstanding that from 1934 they operated a joint supply from Ashford and maintained joint financial accounts for it. The majority of the surviving records are split; the minutes and other records of the Water Committee of the Bridgwater Rural District Council are not complete, and so it is impossible to give a comprehensive chronological history of their activities.

Before continuing the description of the themes begun in the previous chapter, it is important to describe the legal framework under which the water supply and sewerage operated, since this had a considerable impact on their development during the twentieth century.

The Medical Officer of Health's reports for the first thirty years of the century commented frequently on the inadequacy of the water supplies and sewerage but the responsibility rested with the Local Sanitary Authorities and the County Council had little or no powers.

By 1910 several public water supplies in the Somerset rural districts served a number of combined parishes and gradually extended their mains into fresh parishes. Typical instances were the Bridgwater Rural District Council Supply, the South Marsh Supply (Axbridge) and three public supplies in the Langport district. This gradual expansion depended entirely on the accident of geography, and the willingness of particular parishes to take part, but this situation changed radically with the passing of the Local Government Act, 1929, which affected the water supply question in three directions.

1) The de-rating clauses which affected agricultural properties markedly reduced the rateable resources in many parishes, particularly in rural areas, frequently making provision of a piped supply impracticable without financial assistance from other sources.
2) Section 74 removed the limits of borrowing powers of local authorities.
3) Section 57 permitted County Councils to contribute towards the expenses of the provision of a water supply or of a sewerage system.

The Medical Officer of Health wrote in 1929:-

There is plenty of pure water in Somerset ample for every need and the fact that so many areas are inadequately supplied is largely, in my opinion, due to this question being considered in too narrow and parochial a manner. Each small town or parish has been considered merely with its own needs and, with some exceptions, detailed consideration has rarely been given to comprehensive schemes for large areas. The Council hitherto has had very little power or obligation to persuade or constrain local sanitary authorities to provide water for their component parts. The ability to give grants under Section 57 (1) and the more definite association of County Councils with water and sewerage schemes under Section 57 (3) should go a long way towards insuring this broader consideration.

In March, 1930, the County Council decided the general principles with regard to the conditions upon which they were prepared to entertain applications from District Councils under Section 57. These were:-
1) That each application would be in respect of a scheme already approved by the District Council.
2) That the District Council should previously determine what proportion of expenditure it was proposed to charge as special expenses on the parish or parishes concerned.
3) That each application will be considered on its merits, but that the amount of the County Council's contribution shall not, as a rule exceed 25% of the approved expenditure, and in no case shall the County Council's contribution exceed the sum contributed by the District Council under section 56 of the said Act. The operation of section 57 tended to make the provision of water supplies much less parochial and far more comprehensive in scope.

The drought of 1933 served as a great stimulus to make people "water minded", and extreme shortage of water converted many districts to the view that an abundant supply was an essential necessity. The other important factor was section 57 of the Local Government Act, 1929, and in particular the way it had been enacted within the county. The enactments as to de-rating accentuated the difficulties of purely rural areas and made their resources so small that they were unable to pay for necessary services.

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Section 56 enabled a District Council to assist parochial schemes financially and Section 57 enabled a County Council to come to the assistance of such areas by making a contribution towards the cost of water supplies by suitable grants.

In June, 1933, the County Council decided that the systematic provision of comprehensive district schemes was a more economical way of providing rural areas with water. Their policy then became one of urging each rural authority to consider the preparation of a general district water scheme so that the water supply conditions of each parish were considered and so far as possible met, preferably, by large combined schemes. With this went the fixing of a uniform scale of charges to consumers throughout their district and treating the nett deficiency in the working scheme as expenditure for general purposes and not as special expenses. For approved district schemes on these lines, as contrasted with parochial schemes the County Council was prepared to contribute an annual sum not exceeding one third of the nett deficiency of the undertaking

In 1927 discussions were started between the two Councils about preparing a joint scheme to supply the more remote villages and country areas.

An Act of Parliament was obtained and received the Royal Assent on 16 June 1932. This comprised provision of:
1) A reservoir with a capacity of 12,000,000 gallons
2) Additional filter beds
3) New pumping plant
4) Additional purification plant
5) A large rising main to connect with the system of the RDC.

By an agreement scheduled to the Act, 1932, the Bridgwater Corporation supplied water in bulk to the Rural District Council as required, up to a limit of 200,000 gallons in any part of 24 consecutive hours. The water was derived from streams impounded at Ashford reservoir (opened in 1934) and pumped to the Rural District Council service reservoir through a 7" rising main. The Willoughby supply was augmented from this source and supplied most of the parishes in the District; the new parishes supplied were Ashcott, Catcott, Chilton Polden, Edington, Enmore, Greinton, Moorlinch, Otterhampton, Shapwick and Stawell. The RDC were aiming to build service reservoirs in the Quantock and Polden Hills and on Puriton Hill.

The loan was for £35,168 exclusive of subsequent extensions, and the Local Government Enquiry was held in October 1933.

Technical - The Rural District supply and mains

A scheme was started in 1900 by the Rural District Council for serving North Petherton, Bridgwater Without, Chedzoy, Bawdrip, Puriton and Huntspill. The water rights over the Willoughby Estate at Broomfield were acquired in that year on a 99 year lease, renewable from time to time, the rent of £100 per annum being paid for them. The sale of these water rights to the Bridgwater Rural District Council caused problems for the Highbridge Urban District Council which had also been in negotiation with Mr Bowerman, the owner of the Willougby Estate. Several of the councillors accused Bowerman of sharp practice and causing them unneccesary expense. Later, Highbridge obtained its water from sources at Cheddar and Axbridge.

The Willoughby works were constructed in 1903 and opened in 1904 for supplying the parishes of Bawdrip, Chedzoy, Huntspill, North Petherton, and Puriton only. These parishes were sometimes referred to as the Parent Parishes. The estimated population to be supplied was 5,100 and the length of main laid extended to 40 miles. The supply was an abundant one and average daily quantity of water available was about 273,000 gallons. The capital cost of the undertaking in the first place for the original six contributory parishes was £26,962, and for the other parishes or portions of parishes subsequently admitted to the scheme £8207. The working expenses and general cost of maintenance were from £600-£800 per annum in 1928.

The Council's mains network was subsequently enlarged, as follows:
In 1907 a scheme was laid before the Local Government Board for supplying Cossington and other parts of North Petherton Parish. Extensions for supplying Cossington and part of Bawdrip and West Newton in progress during 1908.

During 1911 the extension was made into North Petherton, and a scheme was laid before the Local Government Board for the extension of this supply to the parish of Woolavington and portions of the parishes of Bridgwater Without, North Petherton,

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Chilton Trinity, Westonzoyland and Puriton.
By 1914 the area supplied had a population of 8,429 (1911 Census) and comprised all the following parishes: Bawdrip, Chedzoy, Cossington, Huntspill, Middlezoy, North Petherton, Othery, Pawlett, Puriton, St Michaelchurch, Woolavington, and parts of the parishes of Bridgwater Without, Chilton Trinity and Westonzoyland. During 1917 a scheme was prepared and accepted for Lyng. A further extension of the mains was made for part of the parish of North Petherton (Outwood Lane) and the whole of the parish of Lyng in 1920.

By 1923 the Willoughby Estate had reached its peak of development, and the Council's engineer reported that no further water could be expected from shallow sources. The supply was then augmented during the summer months from a borehole sunk to a depth of about 400' into the upper and middle Devonian strata, which was completed in 1924. A small pump was provided to convey the water into the reservoir. The total yield in winter from the supply was upwards of 1,000,000 gallons per day but it dropped markedly in the summer.

The Willoughby supply was again found to be inadequate in 1928, and in that year supplied 16 parishes or parts of parishes, with an estimated population of 9,100 and 90 miles of mains laid.
In his report the engineer quoted the daily consumption figures.
1907 48,000 gallons
1910 60,000 gallons
1916 100,000 gallons
1920 140,000 gallons
1924 160,000 gallons
1928 190,000 gallons

The engineer further reported that the normal daily requirements for the district then were 190,000 gallons. The daily yield of all the springs and borehole at Willoughby for the past 2 months [Sept-Oct 1928] had been 24,000 gallons short of this, and for many parishes water had been very short that summer. He concluded by recommending that the new Bridgwater Corporation Water Act be put into action.

In addition to the Willoughby supply, within the rural district were several smaller ones. The Rural District also owned the Nether Stowey supply, derived derived from springs in the Devonian strata at Bincombe in Over Stowey parish. The spring were tapped beneath round level and the water carried to a small covered service reservoir of 14.000 gallons capacity. The yield was over 100,000 gallons per day in winter, but much less in summer, and remained ample for the area supplied. This was a gravitation supply and served most of Nether Stowey village. The supply was opened in November 1900. As well as providing drinking water to the village, several fire hydrants were incorporated into the system as the mains were laid.

The Bridgwater Borough supplied the following parishes within the Rural District:

Cannington (1911 Census)	150	persons out of	1007
Bridgwater Without	715	"	1179
Wembdon	419	"	522
Durleigh	9	"	100

Bridgwater Borough Supply (qv) The parishes within the area of this supply under the Bridgwater Act (Water) 1877, were Bridgwater Without (part), Cannington, Chilton Trinity (Part), Durleigh, Charlynch, Spaxton and Wembdon. Of these, about two thirds - of Bridgwater Without, about 13 per cent of Cannington, and about three-fourths of Wembdon are supplied but not the other parishes.

There were also a few private piped supplies:

Thurloxton. The major part supplied from springs from the Ilfracombe Beds of the middle lias, formerly owned by Viscount Portman. There were two small reservoirs of capacity 1,500 and 2,000 gallons respectively.

Goathurst. The greater part was supplied from a private source on the Tynte Estate owned by Lord Wharton. The rest of the parish was supplied from wells.

The remainder of the District including those parts of the above-mentioned parishes not supplied from the piped supplies derived their water from private wells with a few small springs.

In 1930 the parishes served were Aisholt, Ashcott, Broomfield, Catcott, Charlynch, Durleigh (one or two houses from the Bridgwater Borough Supply), Chilton Polden (a very few houses from Willoughby supply), Edington, Enmore, Fiddington, Greinton, Moorlinch, Otterhampton, Over Stowey (a few

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houses from the Quantock Sanatorium supply), St Michaelchurch, Shapwick, Spaxton, Stawell, Stockland Bristol and Sutton Mallet.
The revision in the law which enabled the County Council to grant aid water projects was taken up by the various local councils. In the Bridgwater Rural area the schemes which were helped were:

1935	Small extension in Chilton Polden	£250
1936	Otterhampton	£650
1937	Extensions to Otterhampton	£800
	Stockland Bristol	£1,400
	Fiddington and Keenthorne	£3,314
1938	Chilton Trinity	£1,021
1939	Over Stowey	£6,850
	Nether Stowey Hydrostat pumping unit	£210

Bridgwater Borough - Supply and Service

Population and housing Bridgwater's population grew from 1901:

1901	15,168
1911	17,981
1921	15,962
1931	17,139
1941	No census
1951	22,221
1961	23,700

Year	1891	1917	1924
Area acre	721	961	961
Number of inhabited houses	2,840	3,568	3,829
Population	12,383	16,802	16,430
Average number of persons per house	4.36	4.71	4.29
Birth rate/1000	43.1	14.3	18.91
Death rate/1000	17.03	13.9	12.50
Rateable value	£41,791	£67.769	£56.932
Amount of rates/£	3s 5d	5s 2d	11s 10d
Total Loan indebtedness	£39,791	£41,769	£56,932
Amount produced	£150	£250	£265

In the early years of the century Bridgwater's builders continued to erect new dwellings - Ashleigh Avenue and Coronation Road in 1905, and houses along Durleigh Road and Wembdon roads, but in 1917 it became clear to the Council that there was a housing shortage in the Borough, and that a great number of properties were in an insanitary condition. The Addison Act of 1918 provided Government subsidised housing for the working classes at nominal cost to the Council, and the Borough Surveyor was instructed to prepare a report on building 100 houses in various sites in the Borough. Despite many meetings the Corporation was only able to put forward one proposal, which was promptly rejected by the Ministry of Housing since the cost of each dwelling approached £1,200. The problem then was compounded by there being no spare dwellings within the Borough to rehouse people displaced when insanitary houses which required demolition. The surveyor also prepared a plan for the refurbishment of a number of defective houses in the Albert Street area, which were occupied by poorly paid casually employed day labourers. This scheme would have included an extension to each dwelling upgrading the sanitary and cooking facilities on the ground floor and added another bedroom upstairs, and would have been let for 4/- per week, but the scheme likewise foundered.

Other councils within the County, such as Yeovil and Weston Super Mare did not suffer problems and were able to get on with building council houses from the early 1920's. The County Medical Officer wrote criticising the Bridgwater Coorporation for being so laggard in dealing with the problem and urging them to get down to doing something about it. The Wheatley Act of 1923 greatly eased the trouble, and under it the Council built 735 houses by 1934, at a rental varying between 7/3 to 10/6 per week inclusive of rates. In addition 51 houses had been built by 1934 at rentals of between 3/10 and 5/3 per week to house people displaced during a series of slum clearances in 1933. These properties were built in the Newtown area on the northern fringe of the town. These building developments of course required additional water-mains and drainage, and the services were extended piece-meal to cater for it.

Water Supply

The Medical Officer had little to say about the Bridgwater Borough supply: The daily average quantity of water supplied in 1914 was about 430,000 gallons, at the rate of 23 to 25 gallons per head per day. Contamination occurred along the route to Ashford, and the whole matter was under the consideration of the Town Council. The filtration was only quick-sand filtration to remove suspended particles, and not proper bacteriological sand filtration. 1921 was an exceptionally dry summer. In 1924 at Ashford a chlorinating plant was installed and was reported to be working satisfactorily. The two dry years of 1933 and 1934 had, however, put a great strain upon their resources and in many areas

restrictions of supply had to be enforced.
Considerable additions were made to the supply for Bridgwater in 1938.
The water turbine-driven auxiliary pumps, used when only one steam engine was at work, accounted for about 50,000 gallons in 24 hours. A population of about 18,000 was served. Each steam engine and pump was capable of delivering 375,000 gallons per day. In the early 1920's the heavy cost of coal, together with the handling and hauling from Combwich to Ashford and the increasing maintenance bill for the engines forced the Water Committee to look into the question of more economical working.

The consumption of water varied for all purposes every year:-

Year	Total Consn	Average Consn galls, per head	Cost of Coal £	Tons used
1921/21	191,163,000	29.08	1,700	575
1921/22	162,030,000	25.74	1,270	499
1922/23	149,522,000	22.82	718	351
1923/24	174,790,000	26.18	880	428
1924/25	172,990,000	26.40	643	316

A report from the Borough Surveyor suggested converting the steam engines into hydraulic engines, or alternatively the installation of oil engines and pumps. Later Messrs T & C Hawksley were consulted on the advisability of a gravity supply or adopting some other power than steam. Seeing the break-away level of the springs in the Coombes on the eastern face of the Quantocks was between 500 and 600 over ordnance datum whilst the top water of the service reservoir at Wembdon only 160 feet over datum, a gravitation scheme seemed feasible.

Messrs Hawksley advised that the cost of constructing an impounding reservoir at that site would be far too costly and impose too heavy a rate-burden for later generations. They recommended that better economy might be gained in installing an oil engine and pump, and eventually the tender of Messrs Crossley's for a cold-starting crude oil engine and a Rees Roturbo pump was accepted, and the work was completed in March 1925, together with a bypass at the Wembdon reservoir to deliver water directly into it. Presumably the stand pipe was demolished at the same time. The comparative costs for pumping by steam or oil engines was startling, since they showed a reduction of around 80% in favour of the oil engine compared with the steam plant.

The steam engine averaged over the past two years:-

Amount of water raised [gallons per year]	153,230,000
Consumption per head per day	26.29 gallons
Consumption of coal	372 tons
Cost of coal	£762
Cost of coal to raise 1000 gallons	1.26d

For the oil engine, 6 months to October 1925:

Amount of water raised, gallons	63,880,000
Consumption of fuel oil, gallons	2,243
Consumption of lubricating oil, gallons	60
Cost of fuel oil	£53 16 4
Cost of lubricating oil	£10 17 6
Cost of pumping per 1000 gallons	0.24d

In 1927 additional pumping plant in the form of horizontal semi-diesel engines coupled to triple-throw ram pumps, was installed at Ashford to meet the increased demand. Also in 1927 negotiations began between the Corporation and the Bridgwater Rural District Council about a joint scheme by which the remoter rural villages could be supplied, and Messrs Sandford Fawcett & Partners were called in to advise them.

This involved building the Ashford reservoir, with additional filter beds and new pumping plant. A rising main was to be constructed to link the two mains networks. The Ashford reservoir would impound that water from the Spaxton Streams, which hitherto had not been used. The Corporation were to be under an obligation to provide the RDC with 200,000 gallons daily, though the capacity of the new works could comfortably exceed this. The cost of the new works including the separate pumping plant and the rising main which was to be paid for by the RDC was estimated to be approximately £40,000. The combined daily flow of the Currypool and Spaxton streams was 2,500,000 gallons in summer and 6,000,000 gallons in winter. The maximum daily consumption in the Corporation’s area of supply was 700,000 gallons, to which must be added 250,000 gallons daily compensation water and 200,000 gallons per day for the RDC, making a total daily consumption of 1,150,000. Even during the summer months, and apart from the reservoir which held the equivalent of twelve days supply, the quantity of water available was more than double the maximum consumption then.

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Construction of the New Works at Ashford, 1932-1934

Construction of the new works started in 1932 and was carried out by direct labour under the joint supervision of the technical staffs of the Urban and Rural Councils. The Rural District Council was responsible for the works taking the supply as far as the Borough's authority extended, and the Urban District Council was responsible for the works at Ashford. About 100 men were employed by the Borough and a similar number by the Rural District. With the exception of a handful of specialists all the workmen were drawn from the ranks of the unemployed in the neighbourhood, and they received high praise from the Borough Engineer, Mr R. D. Watson for the effort they all put in. The weather during 1933 was exceptionally good and contributed materially to the speed with which the work was undertaken. They worked from 7.30 a.m. to 4.30 p.m. with half an hour's break for lunch, and were paid 35/- per week. Much of the work was heavy manual labour, in some places excavating through rock and heavy soil for a considerable depth. Initially the workmen had been transported to work by motor bus, but subsequently they all cycled to work and received a cycle allowance.

The work extending the supply involved the construction of various intakes on the Currypool stream, and the construction of a half-mile long concrete aqueduct joining the Currypol stream, above Currypool Farm to the Spaxton stream above Currypool mill. The combined flow then followed the natural course of the Spaxton stream to Ashford.

At Ashford a 12,000,000 gallon reservoir was constructed. It was formed by an earth dam with puddle-clay core lying parallel to Charlinch lane, and with return walls at right angles to the lane. Further capacity was obtained by excavating the topsoil within. At the upper end of the reservoir provision was made for dealing with sediment, and a bye-wash was constructed around the southern side of the reservoir so that flood water could bypass the reservoir completely. A valve tower with screens was built at the dam from which the water was conveyed to the slow sand filters.

Wholesale alterations were made to Hawksley's original plant at Ashford. The sedimentation tank was converted to form two additional filter beds, and a further one was constructed, making six in all, so doubling the previous capacity. The chlorination plant was duplicated, and second pure water well was constructed; the new pumping plant drew its water from this well.

Two independent sets of pumping plant were installed. That of the Urban District comprised a three-cylinder 32 h.p. Ruston oil engine driving a multi-stage centrifugal pump, delivering 45,000 gallons per hour to the Wembdon Road reservoir through the existing pumping mains. The Rural District's plant comprised a twin set of 4-cylinder 52 h.p. Ruston oil engines driving multi-stage centrifugal pumps each delivering 16,800 gallons per hour to the new reservoir in the Willoughby valley, and for this purpose a 7 ", main, nearly 4 miles long was laid. The sections from Ashford to Barford Park was carried out by the Corporation and the remainder by the Rural District Council.

Duplicate booster pumps were installed at Wembdon reservoir to supply the high levels of Wembdon Hill and Durleigh Road. These were automatic electric pumps able to deliver to a head of 70 ft at a rate of 2,400 gallons per hour. A 4". main was laid from the reservoir to Durleigh along Skimmerton Lane, and a 3". main for Wembdon Hill. These mains were the first use in the west country of the Stanton-Wilson joint, which allowed the pipes to be laid around very tight bends.

The Ashford extensions were opened on 22 June 1934 by Sir Edward Hilton Young (1870-1960), when he was also granted the freedom of the Borough. Sir Edward was Minister of Health in Ramsay Macdonald's 'National Government', where his main task was dealing with slum clearance and rehousing. He also piloted through Parliament the first Town and Country Planning Act, 1932. He was ennobled as Baron Kennet in 1935.

The period 1934 to 1938 marked the second and largest distinctive advance in the history of the Bridgwater Waterworks, for during this time the capacity of the pumping machinery and purification plant was increased approximately four times to 4,000,000 gallons per day, and the storage facilities of over 200,000,000 gallons provided where

practically none had existed before. Ashford works were greatly extended, the old steam plant giving way to modem electric motors, diesel engines and centrifugal pumps; mechanical filters were installed together with the construction of an impounding reservoir of 12,000,000 gallons. During this time the Cellophane Works on Bristol Road began construction. The manufacturing processes involved using vast quantities of water, so a new modem station was built at Durleigh to serve the new 200,000,000 gallons impounding reservoir built there, and the high level areas were provided with booster pumps. The Ashford reservoir was fed mostly by spring water, whilst the Durleigh reservoir was fed mostly by run-off. The character and treatment of the two waters varied greatly even though the reservoirs were only about 6 miles apart; the water from Durleigh was to be used mainly for industrial purposes, whereas the Ashford reservoir was for domestic consumption.

Rural Drainage

In 1902 the Medical Officer reported that the drainage at Huntspill was dead level and difficult to remedy. At Woolavington it was bad and at Stawell and Catcott Burtle bad in places. These conditions remained the same for the next few years. Extensions of the sewers at Westonzoyland, Spaxton, Middlezoy, North Petherton and Lyng were undertaken in 1909. In 1912 at North Petherton the sewage disposal works were unsatisfactory; two detritus tanks and two 50ft percolating filters had been constructed and were said to be working well. The dry summer of 1934 caused the rivers to be very low and the effects of any pollution therefore accentuated. A great deal of attention was paid all the year, and particularly in the summer, to the possibilities of pollution. 1935 was noticeable for another very dry summer which materially affected the volume of water in the rivers and markedly aggravated any river pollution which took place. County Sanitary Inspector (W. Dewhurst) was appointed in May of that year and much time was devoted to river pollution problems. The summer of 1936 was rather wet, particularly in comparison with recent years. Mr Dewhurst had in hand a complete survey of all the rivers with records of all possible sources of contamination.

Various drainage improvements were undertaken in 1937: Catcott, £40; Cannington, £140 & £9,800. Mr Dewhurst was still working on the pollution survey and was also producing a map. More improvement schemes were undertaken in 1938: Catcott, £36; Cannington (additional cost), £1,700; Huntspill (East & West), £18,940; Nether Stowey, £4,500. The outbreak of the war in 1939 brought schemes at Cannington, Nether Stowey and Wembdon to a halt: they were suspended for the war's duration. However, some were completed: Catcott, 1939-40, £37; Chedzoy,1939, £112; Woolavington (Postponed), £240; North Petherton, 1939, £8,580.

Bridgwater Borough Drainage

The Medical Officer had little to say about the state of the drainage within Bridgwater Borough. Trouble recurred with the main sewer, in Northgate in 1904 - it required reconstruction. In 1925 he reported that the different urban areas in the County deal with their sewage in a number of ways. A number i.e. Bridgwater, Burnham, Clevedon, Highbridge, Minehead. Portishead, Watchet and Weston-super-Mare discharged their sewage into the sea. Others, e.g. Crewkeme, Street and Ilminster relied mainly on land treatment, the rest provided biological treatment plant with or without some land treatment.