

# THE PUBLIC WATER SUPPLY OF IPSWICH BEFORE THE MUNICIPAL CORPORATIONS ACT OF 1835<sup>1</sup>

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## INTRODUCTION

A PLENTIFUL SUPPLY of pure drinking water has always been one of the essential prerequisites for civilized and healthy urban life. This was clearly understood even in antiquity, when the dry summers of the Mediterranean climate led to the widespread development of hydraulic engineering. Water was brought into Greek cities by ground-level aqueducts at least as early as the 6th century B.C.: in Athens clay pipes were used, while on Samos water was channelled through the acropolis in a rock-hewn tunnel. In the 4th century B.C. the refounded city of Priene in Ionia was supplied from springs a mile and a quarter distant through a terracotta pipe 10in in diameter, which led to a distribution tank inside the walls. Water was brought to Pergamum in the 2nd century B.C. from a spring fifteen and a half miles north of the city, through a pipeline following the contours, leading to a basin from which it flowed under pressure through iron pipes to the top of the citadel. This system is believed to have helped inspire Rome's first major aqueduct, the Aqua Marcia constructed in 144 B.C. (Hornblower and Spawforth 1998, 54–56).

In the Roman period the growing popularity of water-intensive services such as public baths led to the promotion of elaborate works of hydraulic engineering throughout the empire, attested today by such impressive surviving structures as the Pont du Gard on the aqueduct at Nîmes and the bridge at Segovia. But with the decline of urban life in western Europe after the fall of Rome the technology was largely discarded, to be revived in the Middle Ages by the religious orders. By the 12th century, monastic houses had developed efficient systems to provide pure water for their communities (Steane 1993, 104).

Probably the outstanding – certainly the best-known – such system in medieval England was that installed in the Cathedral Priory of Christ Church, Canterbury by Prior Wibert in the mid-12th century. From springs rising to the north-east of the Cathedral, pipes were laid to a circular conduit house, and thence to the city wall, across the moat by a bridge, and so into the Cathedral precincts. On its way the water passed through five settling tanks. The pipeline terminated in a two-storey water-tower (still surviving in partially rebuilt form) with a central pillar through which water was conveyed to a basin in the upper room.<sup>2</sup> An almost contemporary pipeline supplying Lichfield Cathedral close was constructed under Bishop Walter Durdent, formerly Prior of Canterbury where he had been Wibert's superior. It was abandoned only in 1969 – and then only because of the cost both of maintenance and of legal actions against farmers who frequently damaged the lead pipe when deep ploughing – after some 800 years of almost continuous use (Gould 1976, 73–75).

## MONASTIC WATER SUPPLIES IN IPSWICH

In Ipswich, too, the medieval religious houses made more or less elaborate arrangements for their water supply. The Augustinian Priory of St Peter and St Paul, founded in the late 12th century, adjoined St Peter's churchyard in what is now College Street (Fig. 7, M). It obtained its supply from a spring in Stoke on the far side of the river Orwell (which later

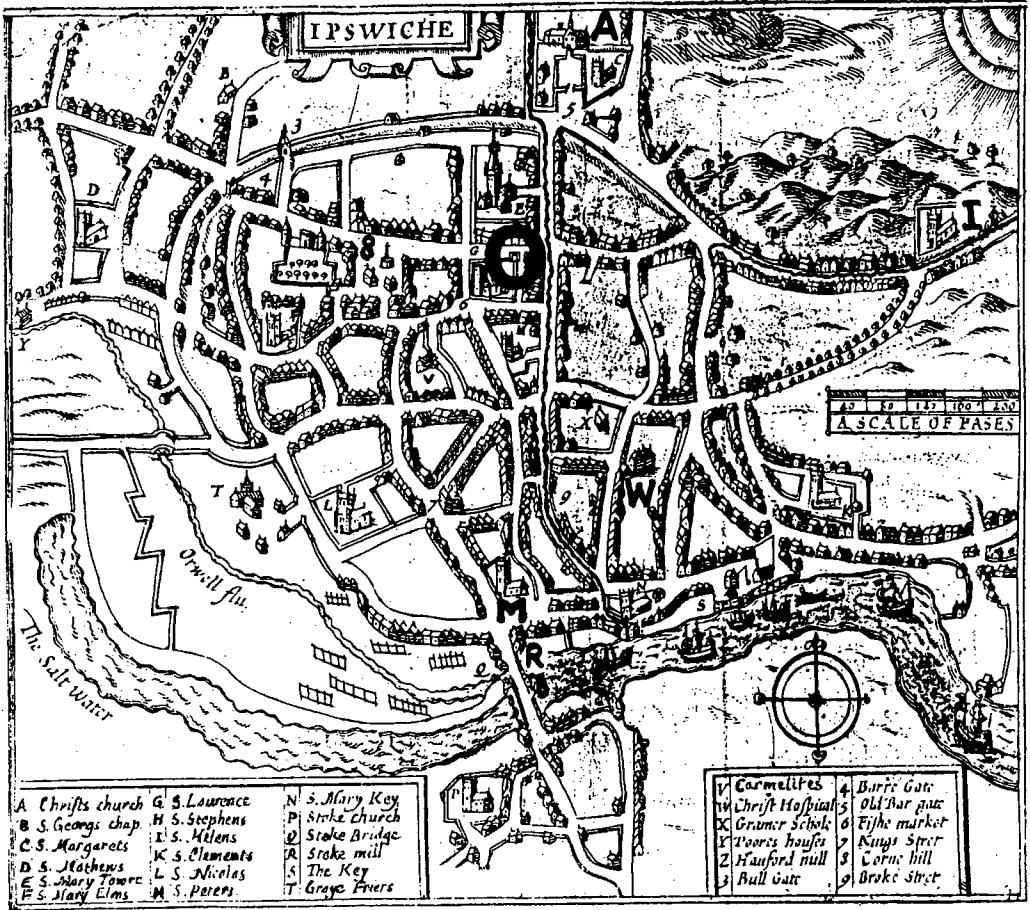


FIG. 7 – Ipswich, from Speed's 1611 map of Suffolk, showing: (A) Christchurch Mansion on the site of Holy Trinity Priory; (M) the site of the Priory of St Peter and St Paul; (R) Stoke Mill; (W) Christ's Hospital, formerly the Dominican Priory (Blackfriars); (circled) the Common Conduit and Conduit House projecting into Tavern Street; (8) the Cornhill; the stream flowing down Dairy Lane immediately west of Christchurch, then southward down Northgate and Brook Streets to the Quay; and (top right) the Cauldwell Brook flowing down Great Wash Lane (St Helen's Street) past St Helen's Church (I) and turning south into the Wash (Orwell Street) to the river.

became the property of the Stoke Waterworks Company, supplying St Peter's parish). The pipes were apparently laid across the river bed and under the mill pond of Stoke Mill (Fig. 7, R). When in 1491 Ipswich Corporation obtained from the lord of the manor of Stoke Hall (or Weylands) a 500-year lease of Stoke Mill and the adjoining pastures of 'le Hopper' and 'le Harpe', access was specifically reserved to the Prior and convent 'for repairing the aqueduct pipes had there or thereafter to be had under the same manner and form in which the same Prior and convent for the time being . . . have or ought to have by reason of two concessions from this manor'.<sup>3</sup>

Recent excavations against the west side of Bridge Street prior to the construction of the second Stoke Bridge and new road layout uncovered a 15-metre length of lead pipe running north–south (parallel with the street). The pipe was jointed, having been made in

sections up to 4.5m long. The finds from its trench suggested a late-medieval (14th- or 15th-century) date.<sup>4</sup> The location, direction and date of the pipe suggest at least the possibility that it formed part of the Priory's water supply.

Numerous references in the Ipswich Borough Archive in the 16th and 17th centuries show that the town's Dominican Friary (Blackfriars), founded by King Henry III in 1263, was likewise supplied by a pipeline, the source of which was probably the springs near Cauldwell Hall later to be utilized by the Corporation for general consumption. Excavations carried out by the County Archaeological Service on the Blackfriars site (Fig. 7, W) east of Foundation Street uncovered a remnant of a feature in the cloister garth which may have been the fountain or conduit into which the pipeline discharged, together with some residual evidence to suggest that water was piped into the south range of the cloister (Mr T. Loader, *pers. comm.*).

In 1569 the Corporation acquired the Friary site and buildings to set up a workhouse to complement the work of the nearby Tooley Foundation almshouses in relieving the poor; the institution was formally incorporated as Christ's Hospital by Elizabeth I's Letters Patent of 1572 (Allen 2000, 464). To provide for the spiritual welfare of the inmates, the borough Assembly in 1577 resolved that the conduit at the Hospital should be removed from one courtyard to another, so that 'a conveyent pulpett' could be erected in its place.<sup>5</sup> Excavation has revealed a post-Dissolution pipe-trench cutting across the nave of the Friary church; a hollow tube of clay at the point of passage through the south nave wall apparently retained the profile of a wooden pipe (Mr T. Loader, *pers. comm.*). This may possibly relate to the relocation of the conduit in 1577.

There is no evidence that the friars permitted the abstraction of water from their pipeline for private lay domestic use, though in the century or so after the Dissolution the number of references in the borough Assembly Books to the illicit tapping of the Christ's Hospital supply suggests that this was a time-honoured offence. The borough authorities did however issue licences for private pipes or 'quills' from the Hospital main, a practice which was well-established by 1614, when the Hospital Governors were authorized to cut off the quill supplying Henry Humfrye's premises unless he appeared to request its renewal for 2s. 6d. *per annum* at the next Great Court 'according to his former agreement'.<sup>6</sup> The previous year the Assembly had resolved that the cost of £2 3s. 4d. incurred in laying a lead pipe from the Hospital to the house occupied by Samuel Ward, Town Preacher, should be borne by the town.<sup>7</sup>

There is no documentary evidence for the source from which Holy Trinity Priory, another house of Augustinian canons, founded *c.* 1177, derived its water supply. The Priory stood on the site now occupied by Christchurch Mansion (Fig. 7, A), outside the North Gate of the medieval town, in its own extensive grounds. Much of the area of the present Christchurch Park abounds with copious springs; indeed the almost total neglect of the drainage in recent years has reduced some low-lying parts to bog. The Priory doubtless took its water from sources on its own property, very probably almost on its own doorstep. Until at least the last decade of the 19th century a 'water house' or conduit head stood behind the Mansion, abutting on the boundary wall adjoining the present-day Bolton Lane, a few yards south of the old toll bar for the Westerfield and Tuddenham Roads near the Woolpack Inn (Fig. 8). It consisted of a single-roomed structure, windowless and open to the roof. In the centre was a rectangular stone tank in which rose a spring of fresh water, the overflow of which ran down Bolton Lane (Corder 1893, 25). Without archaeological excavation of the site we cannot say whether the building antedated the Dissolution but, if constructed by the later owners of the Christchurch estate, the probability must be that, so conveniently situated near the Priory, it was on the same site as the monastic source of supply.

## THE COMMON CONDUIT

Religious houses, disciplined and well organized, often generously endowed and sometimes fortunate in possessing springs on their own estates or sites, were thus well able to provide adequately for their own needs. But with the revival of urban life and the increasing population of towns in the Middle Ages, streams and wells within town walls often became inadequate or were built over and lost, so that supplies for the inhabitants at large had to be sought from further afield (Mitchell and Leys 1963, 269). As early as 1236 Henry III granted the citizens of London liberty to convey water from Tyburn into the City through lead pipes. Work on the Great Conduit in West Cheap (Cheapside), a lead cistern, castellated with stone and supplied from springs in Paddington, was begun in 1285 (Wheatley 1956, 17).

Ipswich was exceptionally fortunate in being well supplied from plentiful springs in the surrounding hills, said in the mid-19th century to number about fifty (White 1844, 50). The town stands in a chalk basin, overlaid in various places by beds of clay, crag, sand and gravel (Glyde 1850, 28), which filter the water, rendering it 'nearly quite free from deposit . . . colourless, inodorous, and with agreeable taste' (Austin 1848, 23). Indeed, so pure was this water that in the first half of the 18th century Thomas Cobbold had it carried down river to his Harwich brewery in specially-constructed vessels, before transferring his entire business to the Holywells estate in Ipswich, close to the springs, in 1746 (Jacobson 1973, 5-6).

Streams from the various springs ran freely through the streets of the town. The Cauldwell Brook, rising from springs near Cauldwell Hall to the east, flowed down (and gave its name to) Spring Road, and then along St Helen's Street (formerly Great Wash Lane) to the end of Carr Street (Fig. 7). Joined here by another stream, St Margaret's Wash, which ran down Bolton Lane (formerly Thingstead Way) from the Holy Trinity water house described above, it then flowed down Upper and Lower Orwell Street ('The Wash') to the river. The overflow from the ponds in Christchurch Park (Fig. 8) ran down Dairy Lane (the lower end of the modern Fonnereau Road), and then by way of the 'Broc' or Brook Street (now Northgate and Upper and Lower Brook Streets) to the Common Quay (Fig. 7).

The Brook Street watercourse was a mixed blessing to householders. In 1567-68 a suit was heard in the court of Star Chamber between Ipswich Corporation and Edmund Withypoll, successor in title to the Priors of Holy Trinity as owner of the Christchurch estate, concerning various alleged infringements of the town's liberties. One of the many matters of complaint was Withypoll's periodic draining of his ponds. One of the Corporation's witnesses, John Ropkyn of St Margaret's parish, barber, aged fifty-five, deposed on 19 May 1568 that the previous month the water was let out with such force that it

did runne thorowe Broke strette and . . . louse the pavynge and by meanes therof did carry a great quantetie of filthe and mier unto the haven or channell and the channell therewith much annoyed and the course of water whiche came thorough the streete aforesaid came with suche force that no man for the space of thre or iiij<sup>or</sup> howers could passe in the same streete, and this deponent in the Priors tyme never knewe any suche Rage of water come that waye.<sup>8</sup>

On the other hand, in later years less combative owners of the estate were prepared, in emergencies, to let out the ponds to assist in firefighting.<sup>9</sup>

But while Ipswich's water was exceptionally pure at its source, by the time it had passed through the filthy streets of the medieval town its fitness for domestic consumption would have been questionable, to say the least. It was probably this consideration, rather than any

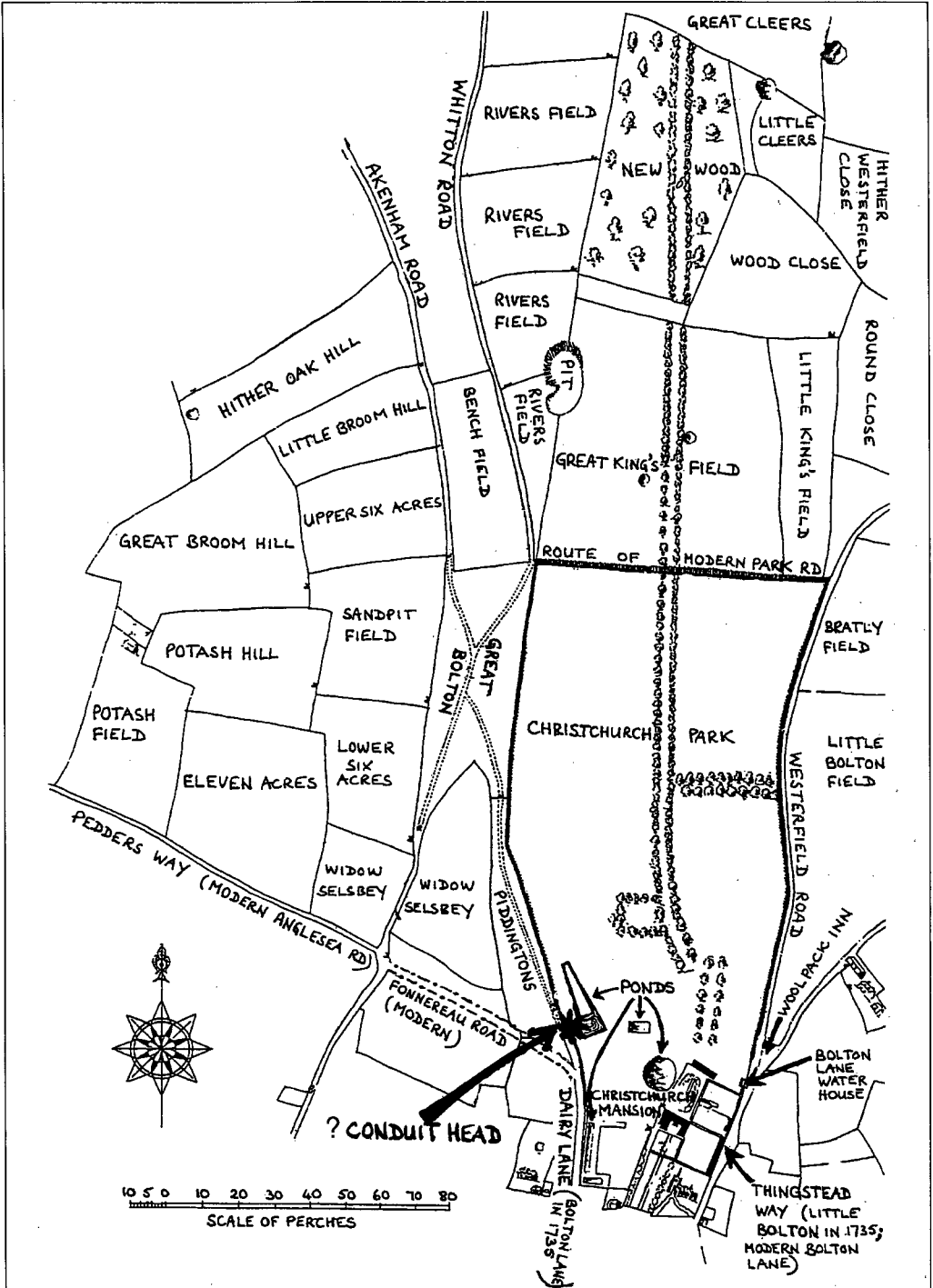


FIG. 8 – Part of John Kirby's 1735 map of the Christchurch Estate, redrawn by John Shewell Corder in 1893 from the original now in Christchurch Mansion and adapted for this article; showing the conjectural site of the conduit head deduced from the Star Chamber case papers (marked by an asterisk between Piddingtons Field and the long (Wilderness) pond), the ponds and the Bolton Lane water house.

shortage of supply, that induced the authorities to follow London's example in providing a 'common conduit' for the townspeople. There is no record of its construction, or of the laying of the pipeline that supplied it, but it was certainly in existence by 1395, for it is mentioned as an abuttal in the earliest surviving grant of common soil for St Lawrence parish, dated 2 November that year. The land in question lay

iuxta Cimiterium Sancti Laurencij . . . ex parte aquiloni et regiam viam que ducit de foro piscium . . . vsque brokestrete ex parte australi cuius unum capud abbuttat super quendam vanellam ducentem de predicto foro vsque a *le condewyte* [author's italics] versus orientem et alid capud abbuttat super unam schopam quondam Johannis Lew versus occidentem.<sup>10</sup>

The conduit stood on the corner of Tavern Street and St Lawrence Street (Fig.7), its position commemorated today by a plaque of (unaccountably) the arms of the Cinque Ports on the wall of no. 44 Tavern Street, which stands on the site of an earlier property known as the Conduit House. Its citing as a landmark in 1395 suggests that it was by then a well-established feature.

There is no early or detailed description of the Common Conduit. Such structures could be very elaborate. That at West Cheap in London, as we have seen, was crenellated in stone. The late 12th-century conduit or fountain in New Palace Yard, Westminster, on the site of the later Great Conduit which stood from 1443 until the later 17th century, consisted of a shallow Purbeck marble basin of twelve fluted lobes, the outside richly carved with foliage. It was raised above an encircling trough, the whole surrounded by a waist-high balustrade of fifteen moulded panels. Water entering from a central inlet in the basin escaped through vents in the lobes into the trough, and thence through four plug-holes into the interior of the base. The vents probably bore decorative masks, and possibly also taps. The quality of the sculpture suggests that the fountain was an important architectural feature of the palace (Davison 1975, 399 and Pl. LXXXIII; Horsman and Davison 1989, 291–95 and Fig. 7).

We can say that the Ipswich Common Conduit, like that in West Cheap, consisted of a lead cistern, enclosed or supported by a stone structure. It was refurbished, and perhaps altered, on numerous occasions throughout its existence. For instance, a lease of the adjoining Conduit House in August 1582 reserved to the town authorities 'liberty to enlarge the conduit out of the room of that house, if they shall see cause' (Richardson 1884, 332). A new bottom for the cistern was cast from 538 lb of lead in March 1609,<sup>11</sup> while more than three quarters of a ton of old lead was re-cast for a new cistern in 1636–37, at a cost of £13 4s. 5d.<sup>12</sup> In November 1793, in order to do away with the encroachment where the Conduit House projected into Tavern Street, the Assembly resolved 'that the Cestern at the Conduit be removed backwards and there continued'.<sup>13</sup>

Captain Francis Grose the antiquary, visiting Ipswich in 1777, described the Common Conduit ('the Cock or publick Fountain') as being stone-built, with the arms of the town carved on it, 'and not the King's Arms as is somewhere said'.<sup>14</sup> The account of its repainting in 1686–87 shows that the Conduit in fact bore two coats of arms;<sup>15</sup> it is therefore possible that Grose saw only one, and that one of the other faces did indeed bear the royal arms. There is of course no way of proving that either coat was an original feature.

From the 16th century, if not before, the Conduit had at least two cocks: the spout of one of them was soldered in 1590 or 1591, 'for that it was lost from the bottom of the Cesterne';<sup>16</sup> and two new crane-neck cocks were provided in 1686 or 1687.<sup>17</sup> In 1602 the Assembly gave licence for the water from the waste pipe to be diverted through St Lawrence's churchyard into the fish market (the present-day Buttermarket) and thence down St Stephen's Lane, 'for the makeinge of the strete swete'.<sup>18</sup>

The Common Conduit was fed by a pipeline of lead from springs on the Holy Trinity (Christchurch) estate. The springs were collected through 'grips' – small furrows or ditches, in effect primitive field-drains – into a brick-built conduit head, which by the late 16th century was provided with three 'sesperalles' (suspirals or settling-tanks: *O.E.D.*).<sup>19</sup> Frequent payments by the Town Treasurer for repairs in the 16th and 17th centuries indicate that the pipe was laid down Dairy Lane (the southern part of Fonnereau Road) and Northgate Street to the corner by the 'Great White Horse', where there was a further settling-tank, from which the pipe turned west along Tavern Street to the Conduit.<sup>20</sup>

The pipeline appears to have been very shallowly buried, for it was subject to frequent damage, both from frost and livestock. At one point during the winter of 1620–21 John Palmer the plumber and his man spent two and a half days repairing it, 'beinge broken after the Froste in more then 30 severall places', while the following winter there were twenty breaks from the same cause. The materials used – canvas, tallow, rosin, pack-thread and faggots – indicate the temporary, makeshift nature of the repairs.<sup>21</sup> On a number of occasions fencing had to be erected in Dairy Lane to protect the pipeline, as in February 1610 when posts and rails were provided 'to keepe of horses from treadinge the pipes'.<sup>22</sup> There were frequent payments for keeping the pipe in Dairy Lane covered; rubble was laid to protect it in 1576–77,<sup>23</sup> but it was again laid bare in 1578–79.<sup>24</sup> Payments in 1589–90 'for piles to drive into the ground to kepe up the pipe of the Conduit in Deyry Lane out of the ditche', and in 1600–01 for scouring the ditch alongside it,<sup>25</sup> suggest that the most likely cause of the recurring problem was the force of the water in the stream overflowing from the Christchurch ponds and making its way down the lane towards Northgate Street.

The scouring and cleansing of the springs, grips, conduit head and settling-tanks was a regularly recurring task, essential to maintain both the quantity and quality of the water supply. Thankfully, however, the payment in 1616 or 1617 of 1s. 'to divers men to drawe out a dead horse out of the springe at the heade of the Common Conduytt'<sup>26</sup> appears to have recorded an isolated incident.

From the time that the surviving Town Treasurer's accounts commence, early in the reign of Elizabeth I, the maintenance of the Common Conduit and its supply system appears to have been financed out of the general revenues of the Corporation. However, in February 1482 the custody and profits of the Conduit had been farmed out to two persons 'for the upholding and repairing of the same' (Richardson 1884, 145), and it is possible that this arrangement represented the usual practice in medieval Ipswich.

But where was the conduit head itself, into which the springs were gathered before being led into the pipeline? Sir James Thornhill, visiting Ipswich in May 1711, states merely that the Common Conduit was supplied 'from a Water house near Mr Martin's Park'.<sup>27</sup> (Leicester Martin was at this time owner of Christchurch in right of his wife Anne Devereux, daughter of the 6th Viscount Hereford.) In December 1563, work was carried out 'at the Conduytt Hedd in the Dayrye Lane',<sup>28</sup> which is more specific. In September 1567 the simmering discontent between the fiery Edmund Withypoll, owner of the Christchurch estate, and Ipswich Corporation erupted into violence over Withypoll's attempt to prevent the Corporation from exercising its claim to police the annual Holy Rood Fair, held partly on Christchurch land. An armed scuffle which broke out near the water house in Thingstead Way (modern Bolton Lane) provoked a suit and countersuit in Star Chamber in 1567 and 1568 (Allen 2000, 14–17), briefly touched upon above. Among the numerous infringements of its liberties alleged by the Corporation (including, as already described, the flooding of the streets when the Christchurch ponds were drained) was the charge that Withypoll had enclosed the conduit head. The case papers in the suits are instructive.

Article five of the schedule of 'injuries and wronges' allegedly committed by Withypoll accused him of having narrowed one end of a common lane leading from the north side

of the town towards Claydon with a ditch and hedge, and hung a gate at either end, 'and by that means inclosed a Common Cunditt hed in the same lane aperteyninge to the Towne'. A note added in a different hand records an agreement that 'the gate that standeth next to Dayrye lane' is to be removed and re-sited beyond the conduit head.<sup>29</sup>

John Kirby's 1735 map of the Christchurch estate (Fig. 8), while unfortunately it does not mark the position of the conduit head, shows that Dairy Lane, just beyond the point at which the 19th-century upper part of Fonnereau Road sweeps west towards Pedders Way (Anglesea Road), formed a junction with a track leading across Great Bolton Field to join the southern end of the road leading to Akenham and Claydon (now Dale Hall Lane). The Star Chamber case papers suggest that the conduit head stood to the side of this track (the southern part of which follows the route of the present Bridleway dividing the Upper from the Lower Arboretum in Christchurch Park), beyond its junction with Dairy Lane, at the point conjecturally shown by the Asterisk in Fig. 8. This interpretation accords with the 1927 edition of the 25in Ordnance Survey map, which shows (Fig. 9) a small pond marked 'Waterhead (Ipswich Corporation Waterworks)' immediately west of the large Wilderness Pond. This stone-rimmed pool, stagnant, fenced off and overgrown with trees, still lies just outside the gateway to the Arboretum, and may well occupy the site of the medieval conduit head.

It is probable that use of the water from the Dairy Lane pipeline was originally restricted to the Common Conduit, to supply which it was constructed. By the mid-17th century, however, if not before, individual householders were permitted to tap into the main. The earliest such licence recorded is in 1663, when Samuel Rennolds was allowed, on payment of a yearly rent of 16s. 8d., 'a quill or pipe of lead to convey water from the pipe of lead that lyeth by his house and lead to the old Cunditt of this towne . . . to his house'.<sup>30</sup> The grant of too many licences could on occasion overload the supply, as in February 1702 when the Great Court ordered that 'Mr John Rycroft shall have the water he hire of the Towne for noe longer then till next Lady Day, for that upon enquiry it is found that the said water belong to the Common Conduit and cannot be spared thence, And then the said water to be cutt off by the Chamberlynes'.<sup>31</sup> By the late 18th century the 'Dairy Lane Water' was supplying private houses in Northgate Street and 'from the White Horse to the Bear and Crown', showing that the main had by then been extended the length of Tavern Street into Westgate.<sup>32</sup>

The Common Conduit itself, as we have seen, was by 1793 considered an obstruction, and was repositioned. In endorsing this recommendation of the Assembly, the Great Court on 1 January 1794 nevertheless ordered that 'the Cestern be left in its present state',<sup>33</sup> suggesting both that it was dilapidated and that it had outlived its usefulness. This is borne out by the Court's further direction some three months later that 'the Main conveying the Dairy Lane water between the White Horse and the Conduit house being in a very ruinous state, is ordered to be taken up as useless'.<sup>34</sup> That the dilapidated Conduit was repositioned rather than demolished suggests a degree of antiquarian interest on the part of the Corporation.

#### THE 'TOWN WATER' OF 1614-15

In the 16th century the rise in population led to increased demand for water in towns and cities. By this time water engineering techniques were sufficiently advanced to permit the bringing of supplies from further afield than had previously been necessary. Perhaps the most impressive work of the century was the conduit constructed for Henry VIII in 1543 to supply Hampton Court Palace. The suppression of Merton Priory in 1538 enabled land in Upper Kingston in Surrey, on which ample fresh springs rose, to be freed for royal use.



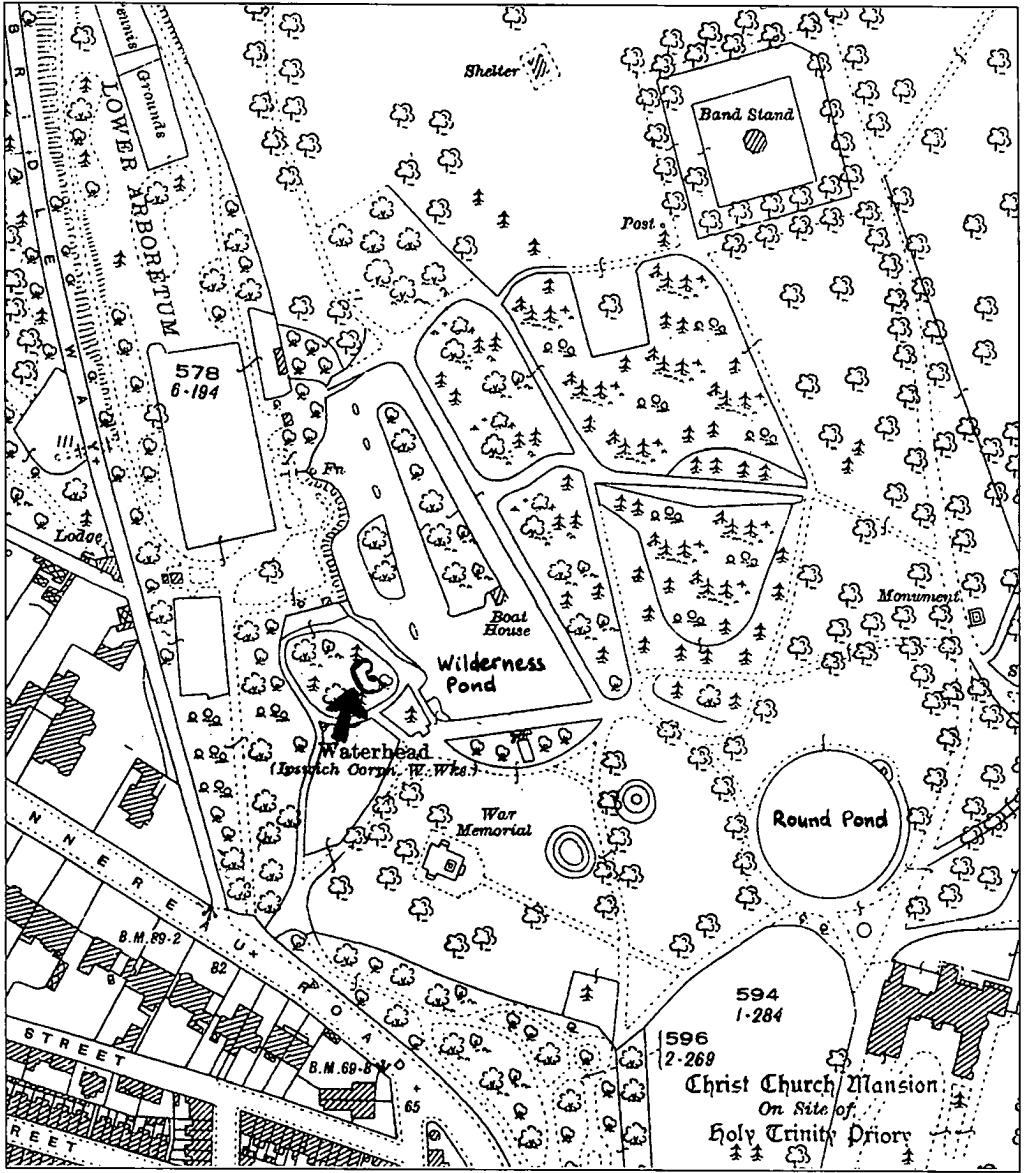


FIG. 9 - Detail from the 25in Ordnance Survey map, 1927, showing the lower end of Christchurch Park, with the Corporation Waterhead (arrowed) which probably occupies the site of the medieval conduit head.

There were three springheads, at each of which a brick conduit head was built. These sources were linked to the Palace by three miles of lead piping, which at one point crossed the bed of the Thames, the submerged section being strengthened with iron. At intervals along the route were tampkins – small brick buildings fitted with stopcocks and expansion tanks, which enabled sections of pipe to be isolated for leaks to be identified and repaired. The conduit's use of high pressure was an important innovation: its fall of 129ft produced sufficient pressure in the three-inch-diameter pipe to deliver running water at second-floor level (Thurley 1993, 164–66). Unlike the shallowly-buried pipeline of the medieval Ipswich Common Conduit, the Hampton Court main was laid at about 6ft below the present ground level, well clear of deep cultivation and the effects of frost. The problem of laying the Thames crossing was presumably overcome by soldering up the sections of pipe on a pontoon bridge and lowering the complete length to the river bed (Lindus Forge 1959, 12–13).

Shrewsbury obtained a new supply of water from outside the town in 1570. A new scheme to supply Norwich was completed in 1584 by two London contractors, who brought water to a cistern in the city centre, from which pipes were laid to the market, where taps were fitted for the use of the tenants; water from both mains and cistern was piped into private houses for an agreed annual charge. At about the same time, as a result of private benefaction, water was piped into the centre of Oxford to two cisterns at Carfax, one for the town and the other for the colleges. At the end of the century water was brought from the river Dee to Chester, to a tower erected on the city wall, from which it was distributed through pipes to the houses of those prepared to pay for the service (Thomas 1933, 61–62).

Not surprisingly, the most ambitious scheme was undertaken to supply the capital. In 1609 Sir Hugh Myddelton secured a contract from the Corporation of London to bring water from springs in Hertfordshire. Many problems of tunnelling and drainage were encountered along the thirty-eight mile route, and the work was not completed until 1613 (Mitchell and Leys 1963, 269–70).

By then Ipswich's leading citizens had been familiar for nearly thirty years with the advantages enjoyed by their counterparts in Norwich, in having water piped directly to their homes. Moreover, the Town Clerk and senior members of the Corporation frequently travelled to London on legal and other official business, and the magnificent engineering feat of the City's waterworks opened on 29 September 1613 was doubtless the subject of much discussion in the town. In less than a year it had been decided to bring a supply of piped water to a cistern on the Cornhill in the town centre (Fig. 7, 8), and to make it available to private householders.

The initial decision was not formally recorded, but the route of the proposed pipeline had already been surveyed before 19 July 1614, when the Assembly resolved that a Mr Least should be paid 6s. 8d. for this work, and at the same meeting it was agreed that three Assembly members should confer with householders along the route as to 'what fyne they will geve towards the bringinge of ronnyng water in pipes before there severall houses, whether they will have a quill into there houses And what yerelie rent besides they will geve towards the kepinge of the meyne pype in Reparacions'.<sup>35</sup> A further survey was evidently required, for early in August a small working party headed by the Bailiffs was authorized to 'take the heythe of the springe hed' and establish whether or not the plan was feasible.<sup>36</sup>

At the same time arrangements were made for financing both the original undertaking and an extension of the pipeline from the Cornhill cistern to St Peter's Church. On 19 September the Assembly 'agreed that the towne shuld bere the adventure of x<sup>m</sup> Foder of leade from Hull to Ipswich which is intended to be employed in pypes for bringinge of Ronnyng water into this towne'<sup>37</sup> (a fother was 19½ cwt (*O.E.D.*); the quantity involved was thus 9¼ tons). Meanwhile it was arranged that £200 should be borrowed for a year from

three leading townsmen, Tobias Blossé, William Bloyse and Richard Marten, against the security of the Portmen's Meadow.<sup>38</sup> Bloyse and Marten, with three others, were appointed overseers, empowered to negotiate with the workmen. Bloyse seems to have had overall responsibility, for in August 1615 he received £50 from the Town Treasurer 'in parte of the mony that he hath leyd out and bestowed', and in the following November it was his account that was audited by the majority of the Assembly. The money left owing to him was to be repaid 'of the First monie that shalbe taken of suche as shall take in water out of the . . . pype'.<sup>39</sup>

The new pipeline was to be supplied from springs near Cauldwell Hall, not far from the source of the Cauldwell Brook. Topography and the street pattern ensured that the route of the pipeline could hardly have been simpler. From the Cauldwell springs, about 60ft above the level of the town centre (Clarke 1830, 316), the pipe was laid almost in a straight line, following the course of the Cauldwell Brook down Spring Road and St Helen's Street (Great Wash Lane) to the junction with Upper Orwell Street (The Wash) at Major's Corner, then along Carr Street and Tavern Street to the Cornhill, a distance of a little over a mile.

A 100-year lease of 'the hedd and cesterne and water comynge into the said head latelie erected in a piece of voide soyle of Sir Edmond Withipoll at the upper end of washe lane' was successfully negotiated in 1615 and approved by the Great Court on 18 September;<sup>40</sup> Sir Edmond (1573–1619) was evidently more favourably disposed than his grandfather had been towards the Corporation. Already in June experiments had been carried out to test the pressure in the main, and a committee was set up in August to determine the most convenient position for the Cornhill cistern, for which clinker (a very hard brick made in Holland) was imported from 'beyond the seas'.<sup>41</sup>

In November the town's legal counsel conducted negotiations with prospective lessees of individual 'quills' or pipes on the terms of their agreements, and it was resolved that the first group of householders (limited to forty in number) should pay a £5 fine (or connexion charge) and a minimum annual rent of 5s. This 'special offer' was of limited duration, for on 22 December the Great Court ordered that those not agreeing to enter the scheme within thirty days 'shall not have any water out of the said pype but by a newe composition'. The take-up seems nevertheless to have been slow, for on 26 March 1616 the period was extended for a further forty days.<sup>42</sup>

The first, and main, section of the system, to the Cornhill cistern, was operational by the end of 1615, for on the following 5 January a committee of seven headed by Bloyse was authorized to 'take order for the conveyenge of the water from the Cesterne at the Cornehill to the corner of St Peter's churchyard', the cost of the work to be met by the town. It was later agreed that the section that lay through the parish of St Nicholas should be paid for by the Chamberlains out of the fines for water-leases purchased by householders along the route of the extension. The first 'Surveyors of the newe waterwork', John Herne and Edmund Deye, were appointed in December 1616, to be responsible for repairs (financed out of the water rents) and to ensure that lessees observed strictly the covenants in their agreements.<sup>43</sup>

The decision of the committee appointed to decide on the best site for the Cornhill cistern is not recorded in the Assembly Book. The preambles to the early water leases state that it was 'neere unto the Moote hall', while most passing references in the Town Treasurer's accounts merely refer to it as being 'at the Cornhill'. Yet none of the various 18th-century depictions of the Cornhill area shows any free-standing structure that could possibly represent the cistern, even though it must have been elevated in order to provide a sufficient head of water to supply the St Peter's area of the town.

The first clue does not appear in the borough records until the mid-18th century. In October 1754 the Great Court ordered that the cistern should be re-lined with lead, since it was 'so farr out of repair that the Foundation of the Town Hall is likely to be very much



Fig. 10 – Ipswich's old Town Hall, engraved by J. Newton and published in 1785. Immediately to the left of the external staircase a wooden lean-to structure obstructs the view of the cistern for the 1615 water supply.

damaged by the water constantly running out' of it. This implies the cistern's very close proximity to the Hall, a view reinforced by an Assembly resolution of 12 October 1796 that new back stairs should be constructed in the Hall, so that the old external stairs on the Cornhill could be demolished, 'and that afterwards new ones be made where the cistern stands'. The question is finally resolved in 1812, when the old façade of the Town Hall was taken down in order to build a more modern frontage. Parts of the building were found to be dangerous, and Benjamin Batley Catt, who had contracted for the work, reported to the Assembly in July that the problem had been caused mainly by 'the water which almost unavoidably escapes from *the Cistern under the Committee Room* [author's italics] which in such a place must sap the foundation and injure the building', so that the Treasury and Committee Room were in need of complete rebuilding. He recommended that the cistern be replaced by 'a vat fixed in the room under the Council Chamber formerly used as a guard room'.<sup>44</sup>

In 1835 Catt was roundly criticised by the Commissioners on the Municipal Corporations, and by implication accused of defrauding the borough on a grand scale (*R.C.M.C.* 1835, 2326–27), but the account of the water damage already evident in 1754 suggests that his report on the state of the Hall in 1812 was not altogether false. We cannot say for certain that the cistern had stood within the Town Hall since 1615, but its decayed state in 1754 suggests that it had been there for some considerable time, and the likelihood is that it had been *in situ* since the original construction of the waterworks.

The old Town Hall (often referred to as the Moot Hall but more properly the Guild Hall), as seen from the Cornhill, consisted of two markedly contrasting buildings. The

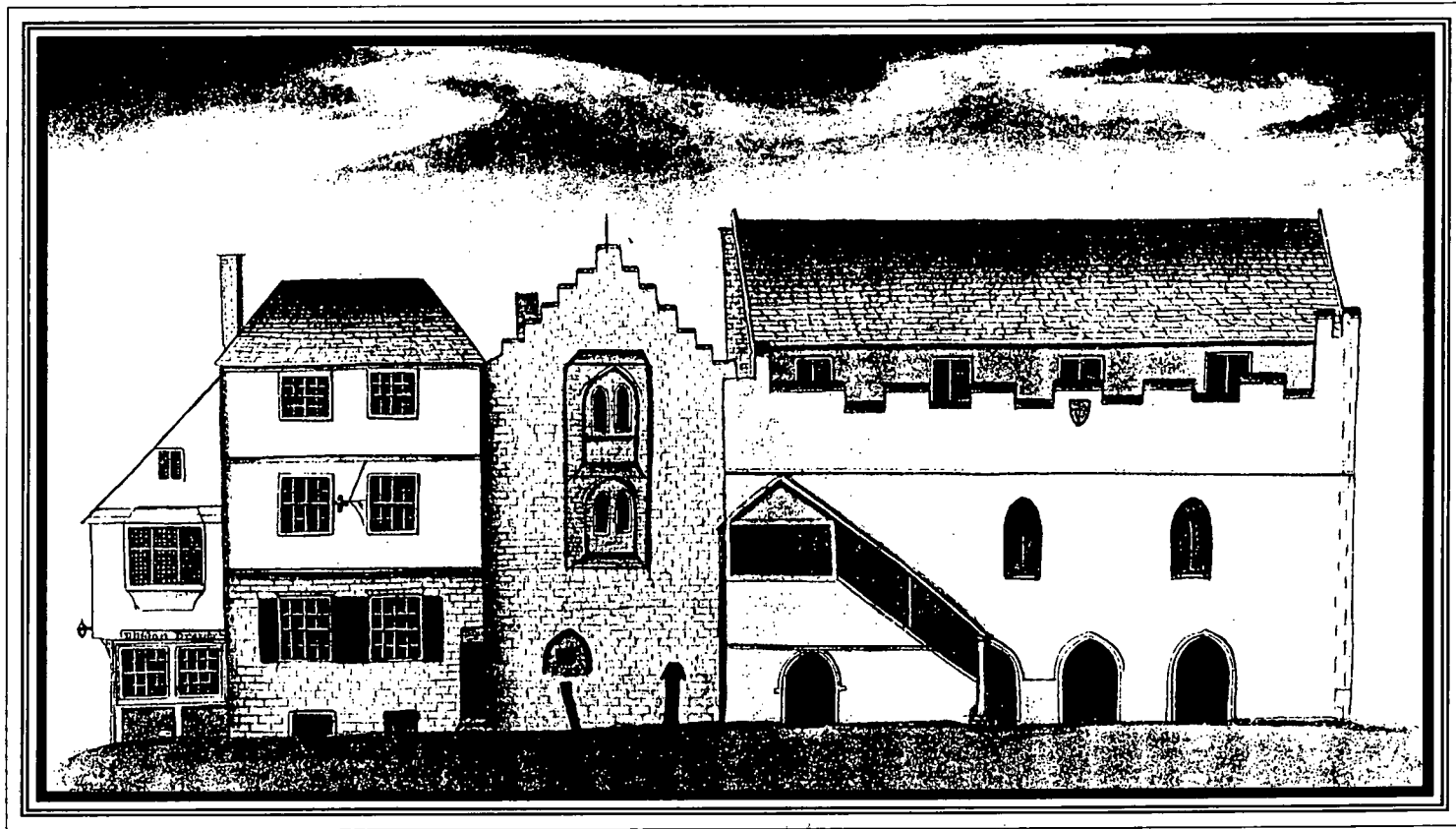


FIG. 11 – Ipswich Town Hall in 1799. The lean-to structure has been demolished, revealing the water cistern set in a Gothic arch with pipework below and (probably) a pump to the right (from an original ink and wash drawing by Benjamin Strutt, by courtesy of Dr J.M. Blatchly).

larger part, to the west (right), stone-built and plaster-faced, had originally been the medieval church of St Mildred, later converted into two storeys by the insertion of a floor. The ground floor was used for cellarage, and an Assembly hall above was reached by the external staircase already noted. To the east (left) was a brick-built extension of the mid-15th century, with crow-stepped gables. Its upper part served as a hall of pleas, council chamber, committee room and the treasury in which the Corporation funds, regalia and archives were stored (Glyde 1889, 72).

An engraving of the Cornhill face of the Hall published in 1785 (Fig. 10) shows the ground floor of the eastern extension obscured by a single-storey lean-to structure, little better than a shed, apparently built partly of timber. In a later print of 1810 (Fig. 12) this has been replaced by a more permanent-looking masonry structure, entered through a Gothic-arched doorway. But a drawing made in 1799 by Benjamin Strutt, a local schoolmaster, after the demolition of the lean-to but before its replacement (Fig. 11), reveals what must surely be the water cistern, set in a Gothic arch in the wall of the 15th-century building, with what appears to be pipework below and a pump to the right. The depiction of a woman with a bucket next to the re-enclosed cistern in the 1810 print may be intended to symbolize the water supply once more concealed to protect it from the weather.

What can be said of the sophistication, adequacy and efficiency of the 1615 system? Though anticipated in Norwich three decades earlier, the provision of piped water directly into the houses of subscribers was by no means the norm. Moreover, though the length of the Ipswich pipeline can scarcely be compared with the thirty-eight mile route of the contemporary London system, it was no mean feat of engineering. There appear to have been intermediate settling-tanks along the route, for in 1682 and 1683 various sums were paid for 'worke done att the Queens Head Cunditt housse' in St Mary le Tower parish. Moreover, like the Hampton Court conduit the system included tampkins for the isolation and repair of leaks; tampkins were repaired and renewed, for instance, in 1674 and 1675, and there are references to stop-cocks at Cox Lane, at the 'Salutation' inn in Carr Street and at the 'Black Boy'.<sup>45</sup>

Yet almost from the beginning demand tended to outstrip supply. As early as 1622 it was considered necessary to hire a consultant, and 'one havinge skill in waterworke latelie employed att Colchester' was sent for 'to take some course for the bringinge of more water to the hedd'.<sup>46</sup> In 1629 the Great Court set up a committee to view the waterworks and take order 'for the bringinge of more water' to the conduit head, and in 1641 major works involved the expenditure of £102 on the purchase of almost ten tons of lead from London.<sup>47</sup> Between 1656 and 1659 major improvements appear to have been made to the system. A committee appointed by the Assembly in July 1656 was ordered to 'take some speedie course for the better bringinge of the water'. Two years later, one of the committee members, Henry Gosnold, received £20 from the Chamberlains towards the works, and it was ordered that the proceeds of the sale of the 'Ship' inn should also be handed over to him. He was paid further sums of £20 'uppon the water accounte' in November 1658 and February 1659, and a final sum of £95 11s. in February 1660.<sup>48</sup> An additional lead cistern 5ft square and 3ft 2in deep was installed at the conduit head in November 1659, and new springs were brought in.<sup>49</sup> The need for these improvements arose from a fundamental drawback of the conduit principle – the absence of any storage reservoir other than the small-capacity cistern on the Cornhill. When the householders' taps were turned off at night or at other times of low demand, the water continued to flow from the conduit heads, and simply overflowed and ran to waste from the cistern at the lower end of the pipeline.

The Town Treasurer's accounts reveal that the system was in need of frequent repair. As early as March 1616, in the first few months of its operation, compensation had to be paid

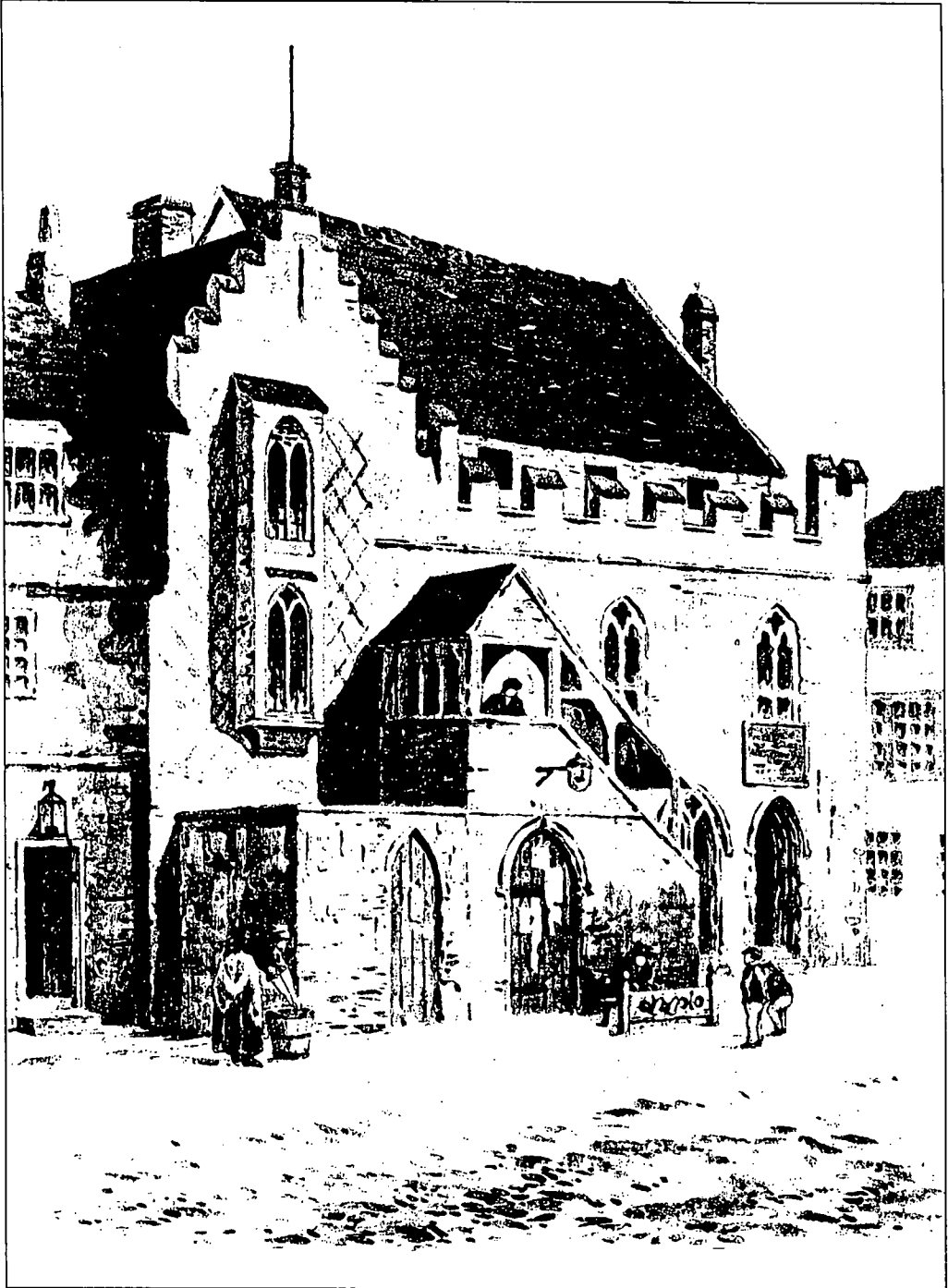


FIG. 12 – Ipswich Town Hall in 1810, the water cistern now concealed by a masonry structure, with access by a Gothic-arched doorway (from a drawing by George Frost, lithographed by T. Black and published by John Raw in 1812).

for flooding in a cellar caused by water escaping from the main.<sup>50</sup> The preambles to the earliest water leases recite that the Corporation had 'layde erthen pottes and a great and meyne pipe of leade' from the conduit head;<sup>51</sup> and indeed earthenware pipes were still being imported from the Netherlands in the autumn of 1618.<sup>52</sup> But the earthen pipes seem not to have been equal to the task, for as early as July 1620 a small committee was appointed to consider 'the layinge of Elmes in the washlane so farre as they thinck fitt for the bringinge of the water from the heade . . . to the leaden pypes'; in October 1623 the overseers of 'the waterworke for the layinge of Elmes where the pottes were before' were ordered to bring in their accounts for audit. Meanwhile in 1622 the Assembly had ordered that the remaining stock of earthen pipes should be sold for the best price obtainable.<sup>53</sup> The improvements carried out between 1656 and 1659 included the replacement of wooden pipes ('trees') with lead 'from the Cunduitt head downward so far as the trees lie', but payments for the freight of elm pipes by ship between 1806 and 1808 show that new wooden pipes were still being laid at the beginning of the 19th century, and in St Helen's parish repairs were still being carried out to them as late as 1824.<sup>54</sup>

The supply was also much impaired (and a great deal of revenue presumably lost) by widespread illicit tapping into the mains – an offence from which not even the august owners of the Hampton Court conduit were immune (Lindus Forge 1959, 4). The problem was familiar even before the new system was operational; in 1615, for instance, water was being taken from the old Christ's Hospital main without licence, and Corporation officers were empowered to 'enter into all houses and groundes in and uppon which the Pype belonginge to the Hospitall lieth . . . and cutt of all quills and cocks fixed and annexed to the said pype and to stoppe uppe the same'.<sup>55</sup> Determined attempts were made at intervals to stamp out the abuse by appointing 'searchers of the waterworks'. Writs were taken out against offenders in 1629, while in July 1656 the Assembly ordered the surveyors 'to cutt of or beate together all such quills as are fastned to the mayne pipe and have noe grants from the towne'. But it was a never-ending battle, and in 1748 the Great Court instituted yet another enquiry into householders' titles to their supplies.<sup>56</sup>

The regulations drawn up in 1615 to govern the supply of piped water to subscribing households were stringent. The leases prescribe 'a Pipe or quill of leade out of the . . . meyne Pipe of the bignesse of an Inche And a Cock of the bignesse of a swanns quill and not above' to bring water into the house. Water was to be available only to the occupants of the house, for domestic consumption; it was neither to be given away to others nor used for purposes of trade. In addition to paying the annual rent, lessees were required to keep their quills and cocks in good repair, not allowing the water to run to waste. Until the later 17th century it was a condition of supply that lessees must keep any wells or pumps on their premises in working order, together with the pulleys, ropes, buckets and ironwork; while later in the century there are provisos against converting properties for such water-intensive uses as inns, alehouses and starch houses.<sup>57</sup> The presentment of several householders by the Headboroughs in 1587 for failing to maintain their wells 'for water to be drawn therout as before they have ben used, therby to be in redynes to quenche fyer . . . when any shall happen therabouts . . . (which God defende)<sup>58</sup> suggests that the emphasis in the water leases on the condition of the wells reflects concern about fire risk in the town as much as about the adequacy of the water supply for domestic use.

The duties of the first 'Surveyers of the newe water worke' appointed in 1616 included the periodic viewing of lessees' houses to certify that the covenants were being observed.<sup>59</sup> As with the attempt to prevent illicit tapping, however, this was an unending task. The Great Court books contain numerous orders for cutting off the quills of defaulters, while the Assembly's resolution of 20 February 1679 that the special committee appointed to view the waterworks 'doe their best to Rectifie all abuses about the water' seems to strike a note of resignation, an acknowledgement that the authorities were fighting a losing battle.<sup>60</sup>



## PRIVATE UNDERTAKINGS

In the provision of piped water, private enterprise did not lag far behind the Corporation. The earliest such concern, which was to become the company known as the St Clement's Waterworks, originated in an act of self-help by a group of eleven substantial house-owners in St Clement's parish, who in September 1618, less than three years after the opening of the 'Town Water', bought from Thomas Alderton a piece of land 12ft square near Bishop's Hill, on which to erect at their own expense a conduit head to collect the water of neighbouring springs,

and therewith to fitt and furnishe not onely themselves and there severall heires . . . which heerafter shalbe . . . owners of there nowe severall mancions . . . but alsoe all others within the same parishe and elsewhere within . . . Ipswich whoe will joyne in equall and prorcionable charge . . . or shall make composition, and agreement with them . . . heerafter for the same.

Twelve months later, on 11 September 1619, 'for and to the furtherance of soe good commendable and worthie a worke', they obtained from the Corporation, for a nominal 12d. annual rent, the grant of a small piece of common soil near the north corner of 'St Clement's High Street', on which to build a cistern. At the same time they were given liberty to dig up the highway to lay and repair 'trunckes of tymber, pypes of lead [and] vawtes of bricke', subject to their making good the damage to the street. Proprietorship of the waterworks long remained with the successors in title to the eleven original houses supplied; in December 1653 Lionel Edgar, the sole surviving original proprietor, granted a feoffment of the waterworks to the then owners of those properties<sup>61</sup>

As with the Corporation water leases, the Company grants were made on stringent terms, which included the restriction of the right to water to members of the lessee's own household on pain of a 12d. fine for each offence, and a similar penalty for wilfully allowing a cock to run to waste. Company surveyors had the right to inspect the premises for 'defaults and offences' four times a year, and from the transfer of ownership in 1653 failure to maintain at least one pump in working order was punishable by forfeiture of the piped supply.<sup>62</sup>

A second private company, the Quay (usually spelt 'Key') Waterworks, was set up within nine years of the St Clement's concern. In September 1627 twelve prominent burgesses bought from Samuel Cutler two pieces of land in St Helen's, near the Withypoll estate of Cauldwell Hall, on which they built two conduit heads to gather the water from springs rising on the south side of the Cauldwell Brook, for the supply of piped water both to their own houses and those of prospective subscribers. In July 1629 they obtained a 500-year grant from the Corporation, of liberty to dig up the common soil to lay and maintain the pipes along the specified route. This lay down the Great Wash Lane through Carr Street to the corner by the 'White Horse', then down Brook Street to St Mary at Quay Church, and thence to the Common Quay, where a cistern was to be placed. Branch pipes were also planned from the 'Greyhound' in Brook Street 'through the streete leading towards Sainct Lawrence Church' and into Tavern Street.<sup>63</sup> An agreement for re-laying part of the Quay main in 1803 shows that its terminus on the Common Quay was situated near the 'Bull' inn.<sup>64</sup>

In permitting the laying of the Quay main, the Corporation was nevertheless anxious to preserve its monopoly, safeguard its revenues and recoup, so far as possible, the expenditure on its own new waterworks. A condition of its grant was that the proprietors of the Quay company should not

suffer any water to be taken out of the said pipes . . . by any house or houses before or by which the mayne pipe . . . of the . . . Bailiffes, Burgesses and Commonaltie doe lye, or runne, or to any howses to which the said Bayliffes . . . have graunted any water out of the said mayne pipe . . . without the consent and licence of the said Bailiffes . . . first had and obeyned in wryting under the Common Seale of the . . . Towne.

In 1709, by which time further springs and conduit heads had been acquired, the Quay undertaking was purchased by Samuel Caley, an Ipswich grocer,<sup>65</sup> and was thereafter frequently known as 'Caley's Water'. Caley died in 1713, and his executors, given discretion in his will, eventually decided to sell. A survey ordered by the Great Court concluded that a purchase would be 'of great use and service' to the town, and the works were acquired for £150 in March 1718. A water lease issued later that year to William Clarke for his house in St Mary at Quay parish waived the customary connexion charge, 'in consideracion of the good services done . . . by the said William Clarke in his procuring . . . the said water of Mr Caly . . .'.<sup>66</sup> Only six years later, however, the Quay water rents were farmed to Samuel Hamblin towards repayment of a debt owed him by the Corporation.<sup>67</sup>

One further 17th-century work, though minor, deserves passing mention. On his death in 1669 Sir Manuel Sorrell, a wealthy Portman, merchant and shipowner of St Peter's parish, enjoined his heirs to permit the water from springs on his property 'to run and have passage in St Peters Streete . . . for the common good of the neighbourhood there, without . . . stopping, neglect or interrupcion', and to take measures for 'the preservation of the said water and the passage thereof'. This bequest resulted in the erection of a conduit or fountain in the street, the stone head of which, carved with a lion mask, is now preserved, much eroded, built into a wall adjoining the west side of Christchurch Mansion.<sup>68</sup>

#### THE SUPPLY ENDANGERED

Early in the 18th century the Corporation came close to forfeiting its right to the Cauldwell springs which supplied the 'Town Water' system of 1615. Sir Edmund Withypoll's 100-year lease of the spring-heads was due to expire in 1715 but, apparently because of a dispute between the Corporation and Leicester Martin and his wife Anne, successors to the Withypoll estates, over an abatement which the Borough claimed in lieu of Land Tax, the rent had allegedly gone unpaid for several years. In April 1714 the Martins commenced proceedings in Chancery against the Corporation for recovery of the rent arrears, and for good measure claimed the profits arising from the Corporation water leases to householders, intimating also that the terms of any new lease of the conduit-heads should reflect the increased value of the waterworks since 1615. The defendants counterclaimed that at least one of the heads in question was not in the Martins' ownership, and declared that the rent on the others, which they claimed to have paid until two years before, would have been withheld earlier had not their officers 'purely owing to . . . ignorance or mistake' until recently omitted to demand the abatement.<sup>69</sup>

The result of the proceedings is not recorded. Chancery actions were notoriously slow, and it may well be that the Corporation's purchase of the Quay Waterworks in 1718 was a form of insurance, reflecting continuing uncertainty over the outcome of a lawsuit still pending. What is certain is that the Corporation continued to enjoy the occupation of the conduit-heads until the 19th century.

But in 1828 the then owner of the Withypoll estates, the Revd Charles William Fonnereau, attempted to revive the issue, alleging that any lease that might have been renegotiated with the Martins must by now have lapsed, and demanding that the

Corporation forthwith either cease to use the conduit-heads or come to 'some fair and equitable' financial agreement with him for their use, otherwise 'the pipes leading therefrom will be severed and the supply of water stopped'. In response the Assembly resolved that the Corporation, considering its title 'unimpeachable', would defend any legal action to the utmost of its power. But at the same time they expressed the hope that Fonnereau would not carry out his threat to cut off the water, 'that being a measure which, while it would be attended with serious inconveniences to the tenants of the water, would, they submit, place him in no better situation with regard to his remedy'.<sup>70</sup> The matter is not referred to again in the record, and was presumably still unresolved at the demise of the old Corporation in 1835.

Once the early 18th-century crisis over the spring-heads was, for the time being at least, safely past, the Corporation resumed its somewhat cavalier attitude to matters of title. When in September 1759 Henry Betts, owner of land through which the 'Town Main' was laid alongside the Great Wash Lane, not unreasonably demanded a fine and annual rent for the continued passage of the water, the Great Court embarked on a short-lived trial of strength. Declaring Betts's demand 'unreasonable', the Court gave order 'to remove the pipe forthwith and lay the same in the King's Highway'. In their arrogance the authorities appear to have overlooked the considerable expense involved; less than two months later they were obliged, 'for the benefit and advantage . . . unto many of the inhabitants . . . of Ipswich', to accept a lease from Betts of a strip of land 6ft wide through his property. The terms included payment of £10 10s. composition for rent arrears and an annual rent of 10s. for the future. As a face-saving device Betts was, however, forced to agree to cut off the quill connecting the main to his own premises, and not to re-connect it without leave from the Corporation.<sup>71</sup>

#### LAST PHASE AND CONCLUSION

By the end of the 18th century the town was supplied with water by a network – perhaps more accurately described as a patchwork – of different systems. The Corporation itself controlled three: the old 'Dairy Lane Water' which had originated in the Middle Ages and served only the town centre, the 'Town Water' of 1615 and the 'Quay Water' acquired in 1718. There were also various private suppliers, of which the Stoke system (originally constructed for the Priory of St Peter and St Paul) and the St Clement's Waterworks were the earliest; additionally parts of the town were supplied from the Cobbolds' springs at Holywells, those of the Alexanders in St Matthew's parish, and others in the ownership of the Fonnereau and Orford families.<sup>72</sup>

Given the abundance of its surrounding springs, Ipswich should have been free of water shortage. But by the 19th century, because there was no reservoir of adequate size to store the water at night, an estimated one-third of the output of the conduit-heads was allowed to run to waste, so that houses in the higher parts of the expanding town were sometimes left without water for much of the day (Glyde 1850, 29).

Moreover, by the beginning of that century the 'Town', 'Quay' and 'Dairy Lane' water supplies had fallen victim to the endemic corruption and factional infighting that effectively paralysed the town's government in the last half-century of the old Corporation's existence (Grace 2000, xlii–xliv). The report of the Municipal Corporations Commission of 1834 was damning. *Inter alia*, it placed much of the blame for the inadequacy of the water supply on

the constant jobbing which is going on with the pipes. This jobbing will be found throughout the management of the Corporation property. The object is, to secure

votes at the elections, by finding constant employment for freemen; and with this view the pipes are frequently taken up, and the water is turned off without necessity, and only as an excuse to keep a certain number of voters in pay. One of the portmen states, that many of them may be seen idling about the streets, while they are receiving wages for this superfluous work (*R.C.M.C.* 1835, 2321–22).

Even when due allowance is made for the Commissioners' known political bias, their charge is fully borne out by the evidence of the Town Treasurer's, Chamberlains' and Water-Rent Collector's payment vouchers, with their record of constant tinkering with the system.

The problem was exacerbated by the Corporation's continued insistence that private suppliers should not compete in areas where it enjoyed a monopoly. As late as April 1833, little more than two years before the Corporation's demise, John Orford was only permitted to lay a main from springs opposite his house, Brooks Hall, through St Matthew's Street, Church Lane, Lady Lane, Globe Lane and Old Gaol Lane, extending to the 'Bell' corner on the Cornhill, subject to an undertaking 'not to lay any pipes for the conveyance of water or encroach upon the common soil of the town in any other of the streets . . .'.<sup>73</sup>

Nor should it be forgotten that, ever since 1615, the piped water supply had been available only to those householders who could afford to lease or rent it. As we have seen, the original scheme was at first limited to forty households; even by the 1680s only 139 (about 8 per cent) of the 1,640 households listed in the 1674 Hearth Tax returns were connected to the mains (Reed 1973, 69). Though the number of subscribers to the Corporation and private supplies increased steadily during the 18th century, many of the town's inhabitants were always dependent on their own or common wells, or on streams which, however pure at source, must have become disgustingly polluted in their course through the streets to the river.

In Tudor times such pollution was often wilful. In 1567 the Corporation had complained in the Star Chamber that Edmund Withypoll, in draining his ponds into the stream in Brook Street, had polluted the town with 'all the filth of his house', and in the protection of the watercourses against those of anti-social tendencies the authorities faced an unending struggle. In August 1587, for instance, the Headboroughs presented John Gardiner the younger and John Walker, who had 'anoyed' the Cauldwell Brook flowing through their premises 'with horse mucke and horse uryn ronnyng and falling into the same broke by reason that they have severall stables erected uppon or nere the said broke'.<sup>74</sup> Nor at this period was it unknown for domestic privies to be built above the watercourses.<sup>75</sup> The underlying problem, however, was the lack of proper surface drainage or sewage systems, so that by the 19th century 'the foul matters which now abound in the Town' were even affecting the foundations of the houses, keeping them 'in a state of unwholesome damp and discomfort, from flood and soakage of the soil' (Austin 1848, 8). As in so many other towns and cities, it was to be left to the Victorians to provide Ipswich with a modern, adequate and efficient water supply.

But despite all these shortcomings and the politically motivated abuses of the last years of the old Corporation, the town fathers of 17th-century Ipswich had constructed, expanded and improved, and their 18th-century successors had on the whole maintained, a water supply and distribution system which, by the standards of the day, was modern and sophisticated (Thomas 1933, 62), and in which any English provincial town could have taken pride. That its creators *were* consciously proud of their achievement is borne out by the preambles to the early water leases, in which they proclaimed at length the success of their engineering feat, undertaken 'for the generall good and benyfytt of the said towne and Inhabitants thereof'.<sup>76</sup> It was no idle boast: truth was on their side.

## ACKNOWLEDGEMENTS

I am very grateful to Dr John Blatchly for permission to reproduce Fig. 11 and for drawing my attention to Francis Grose's mention of the Common Conduit in his 'Journal of a Tour in Suffolk'; to Mr Robert Malster for kindly allowing me to read, before publication, part of his *History of Ipswich*; and to Mr Tom Loader of the County Archaeological Service for information on excavations in Bridge Street and on the Blackfriars site.

## NOTES

- 1 This paper originated in discoveries made while cataloguing the Ipswich Borough Archive for the 'Ipswich 800' project to celebrate the 800th anniversary of King John's charter of 1200 to the town (see Allen 2000). Unless otherwise stated, all MSS cited are in the Borough Archive in the Suffolk Record Office, Ipswich. Some borough Great Court and Assembly Books have a dual system of numeration; because the contemporary pagination is sometimes erratic, the modern foliation is cited in this article.
- 2 Lang-Sims 1979, 80–82. The plate on p. 80 shows the medieval plan of the distribution system, in a copy of the Utrecht Psalter made by Edwine, a monk of Christ Church, now in the library of Trinity College, Cambridge.
- 3 Undated 20th-century transcript of a 1541 terrier of Stoke Hall manor, in the local studies library, S.R.O.I., 333.3220942649, f. 3; I am indebted to Mr R. Malster for this reference. The location of the original terrier is unknown. On the spring or 'fountain' in Stoke which eventually became the property of the Stoke Waterworks Company, see Company deeds, S.R.O.I., DD 2/5/133–143. The borough Assembly Book for 1644–80 (C/4/3/1/6) contains (p. 237) details of a later pipe laid in the river bed: on 7 Nov. 1659 Thomas Wright, salter, was given liberty to lay 'pipes of timber and lead' from a pond in Austins Green to his house 'thorowgh the Channell, And what damage anie Shipp or vessell shall suffer therby the said Thomas to make good . . . '.
- 4 Mr Tom Loader of the Suffolk County Archaeological Service Field Team, *pers. comm.*, 25 Feb. 2000; a section of the pipe has been retained in storage.
- 5 Assembly Book, C/4/3/1/1, f. 145v., 17 Apr. 1577.
- 6 Assembly Book, C/4/3/1/4, f. 124v., 22 Feb. 1614.
- 7 *Ibid.*, f. 104v., 13 Jul. 1613.
- 8 Case papers, C/1/6/5/5, ff. 18–19. Ropkyn was a member of a wealthy family of tanners in St Margaret's parish: the altar tomb of his great-grandfather William (d. 1512), the brass indents now empty, still stands in the south chancel chapel of St Margaret's Church (Dr John Blatchly, *pers. comm.*).
- 9 Kirby 1764, 8. These means were employed as recently as January 1848, when the premises of the *Ipswich Express* in the Buttermarket caught fire, and an adequate supply of water for the fire engines was only obtained from a temporary dam across Brook Street, filled from the Christchurch ponds (*Ipswich Mercury*, 1 Feb. 1848; I am indebted to Mr R. Malster for this reference).
- 10 Grant of a void place of land, 27ft x 11ft, Tuesday after All Saints, 19 Ric. II, C/3/8/3/1.
- 11 Town Treasurer's accounts 1608–09, C/3/4/1/34.
- 12 Town Treasurer's accounts 1636–37, C/3/4/1/55.
- 13 Assembly Book, C/4/3/1/8, 5 Nov. 1793.
- 14 Grose, *Journal of a Tour in Suffolk*, B.L. Add. MS 21,550, 10 Sept. 1777; I am indebted to Dr John Blatchly for this reference.
- 15 Town Treasurer's accounts 1686–87, C/3/4/1/94.
- 16 Town Treasurer's accounts 1590–91, C/3/4/1/21.
- 17 Town Treasurer's accounts 1686–87, C/3/4/1/94.
- 18 Assembly Book, C/4/3/1/3, 16 Mar. 1602.
- 19 In 1613–14 two labourers were paid 2s. 8d. 'to gripp the grounde leading to the Conduytt head for the springs to come downe' (Town Treasurer's accounts, C/3/4/1/39); and in 1590–91 two men were paid for 'Digginge beyond the Conduit house in the field from the house to the three sesperalles and coveringe ageine with planckes Claye and strawe' (Town Treasurer's accounts, C/3/4/1/21).
- 20 In 1579–80, 6d. was paid for a plank to cover 'the sesperall at the Whyte Horse corner' (C/3/4/1/13); and in 1603–04 two workmen were paid 2s. for a day's work 'in digging and felling up of the Towne pype betweene the White Horsse and the Conduite' (C/3/4/1/31).
- 21 Town Treasurer's accounts 1620–21 and 1621–22, C/3/4/1/43, 44.
- 22 Town Treasurer's accounts 1609–10, C/3/4/1/35.
- 23 Town Treasurer's accounts for that year, C/3/4/1/10.

- 24 Town Treasurer's accounts, C/3/4/1/12.
- 25 Town Treasurer's accounts, C/3/4/1/20 and C/3/4/1/28 respectively.
- 26 Contemporary fair copies of Town Treasurer's accounts 1616–17, C/3/2/1/2, f. 238v.; the original accounts for this year have not survived.
- 27 Fremantle 1975, 4. In stating, however (note 3), that the 'water house' mentioned by Thornhill stood north-east of Christchurch Mansion on Bolton Lane, his editor has misinterpreted Corder's account of the Mansion (Corder 1893, 25); the Bolton Lane conduit house, already discussed above, was the Mansion's own supply.
- 28 Town Treasurer's accounts for year ending 13 Dec. 1563, C/3/4/1/3.
- 29 Star Chamber case papers, C/1/6/5/1, f. 1.
- 30 Great Court Book, C/2/2/2/2, f. 158v., 16 Jun. 1663.
- 31 Great Court Book, C/2/2/2/3, f. 170r., 12 Feb. 1702.
- 32 Chamberlains' water rental 1788–89, C/5/5/5/19, where Northgate Street is described as Upper Brook Street (the present Upper Brook Street being then known as Middle Brook Street).
- 33 Great Court Book, C/2/2/2/8, p. 155.
- 34 Ibid., p. 159, 9 Apr. 1794.
- 35 Assembly Book, C/4/3/1/4, ff. 134v., 135r.
- 36 Ibid., f. 136r., 4 Aug. 1614.
- 37 Ibid., f. 140v., 19 Sept. 1614.
- 38 Ibid., ff. 136v., 138r., 4, 8 Aug. 1614; Great Court Book, C/2/2/2/1, ff. 298r., v., 303r., 8 Aug., 8 Sept. 1614, 17 Aug. 1615. For the original mortgage and its counterpart, see C/3/9/2/1–2.
- 39 Assembly Book, C/4/3/1/4, f. 142v., 3 Oct. 1614; Great Court Book, C/2/2/2/1, ff. 303r., 304v., 305r., 17 Aug., 8 Nov. 1615.
- 40 Assembly Book, C/4/3/1/4, f. 164r.; Great Court Book, C/2/2/2/1, f. 304r.
- 41 Assembly Book, C/4/3/1/4, ff. 158r., 163r., 168r., 12 Jun., 17 Aug. and 2 Nov. 1615.
- 42 Assembly Book, C/4/3/1/4, f. 168v., 6 Nov. 1615; Great Court Book, C/2/2/2/1, ff. 304v., 305r., 305v., 8 Nov., 22 Dec. 1615 and 26 Mar. 1616.
- 43 Assembly Book, C/4/3/1/4, ff. 177v., 205v., 197r., 5 Jan. 1616, 11 Apr. 1617, 20 Dec. 1616.
- 44 Great Court Book, C/2/2/2/7, p. 44, 29 Oct. 1754; Assembly Book, C/4/3/1/8, unpaginated, 12 Oct. 1796 and 27 Jul. 1812.
- 45 Treasurer's accounts 1681–82, 1682–83, 1674–75 and 1689–90, C/3/4/1/91, 92, 88, 96.
- 46 Assembly Book, C/4/3/1/5, f. 36v., 17 Sept. 1622.
- 47 Great Court Book, C/2/2/2/1, f. 340v., 1 Sept. 1629; Treasurer's accounts 1640–41, C/3/4/1/58.
- 48 Assembly Book, C/4/3/1/6, pp. 84, 208, 216, 223, 239, 9 Jul. 1656, 15 Jul. 1658, 4 Nov. 1658, 28 Feb. 1659, 17 Feb. 1660.
- 49 Ibid., p. 236, 7 Nov. 1659; Great Court Book, C/2/2/2/2, f. 127r., 10 Nov. 1659.
- 50 Assembly Book, C/4/3/1/4, f. 185v., 26 Mar. 1616.
- 51 E.g., a lease of 23 Dec. 1615, C/5/5/2/1.
- 52 Assembly Book, C/4/3/1/4, f. 235r., 9 Oct. 1618.
- 53 Assembly Book, C/4/3/1/5, ff. 11v., 48r., 31v., 30 Jul. 1620, 7 Oct. 1623, 26 Apr. 1622.
- 54 Great Court Book, C/2/2/2/2, f. 103r., 20 Aug. 1657; vouchers of the Collector of Water Rents 1806–08, C/5/5/8/8; Treasurer's vouchers 1823–24, C/3/4/4/89. The wooden pipes still in place in the 19th century were probably part of the main of the Quay Waterworks acquired by the Corporation in 1718, more than sixty years after wood had given place to lead in the 'Town' water system of 1615.
- 55 Assembly Book, C/4/3/1/4, f. 157v., 12 Jun. 1615.
- 56 Assembly Book, C/4/3/1/5, f. 92v., 13 Apr. 1629; C/4/3/1/6, p. 184, 9 Jul. 1656; Great Court Book, C/2/2/2/6, f. 167r., 29 Nov. 1748.
- 57 Corporation water leases, C/5/5/2, *passim*.
- 58 Headboroughs' Verdict Book, C/2/8/4/2, 7 Aug. 1587.
- 59 Assembly Book, C/4/3/1/4, f. 197r., 20 Dec. 1616.
- 60 Assembly Book, C/4/3/1/6, p. 531, 20 Feb. 1679.
- 61 The original proprietors were Samuel Cutler, Lionel Edgar, Thomas Eldred, Benjamin Osmond, Nicholas Freman, Richard Wade, William Searles, John Barber, Robert Bull, Thomas Wright and William Crofford: St Clement's Waterworks deeds, S.R.O.I., DD 2/5/2, 3, 5, 11 Sept. 1619 and 10 Dec. 1653; copies of some deeds are entered at the front of the earliest Company minute book, DD 2/2/1.
- 62 Articles agreed by the founding proprietors, 29 Mar. 1620, annexed to water lease to Edmund Humfrey, 4 Apr. 1620 (DD 2/5/4); feoffment, 10 Dec. 1653 (DD 2/5/5).
- 63 The original proprietors were Tobias Blossie, Edward Mann, Thomas Cleere, John Reynolds, William Inglethorpe, John Carnaby, John Blomefield, Ralph Noore, John Catcher, Barnabas Burrough, John Warner and Edward Hedge: Quay Waterworks deeds, C/5/5/1/1, 11 Jul. 1629. That both the Company and Corporation pipes followed the route from Cauldwell Hall along Carr Street explains Clarke's statement (1830, 316) that mains ran along both sides of this street.

- 64 17 Jun. 1803; found among the payment vouchers of the Collector of Water Rents for 1802–03, C/5/5/8/4.
- 65 Memorandum dated 11 Jul. 1709 annexed to deed of 26 Oct. 1685, C/5/5/1/6.
- 66 Caley's will, S.R.O.I., IC/AA1/142/60, dated 5 Jan., proved 5 Feb. 1713; Great Court Book, C/2/2/2/5, ff. 80v., 82v., 89v., 18 and 28 Nov. 1717, 30 Jun. 1718; conveyance, 27 Mar. 1718, DD 2/5/128; water lease 26 Jun. 1718, C/5/5/2/52.
- 67 Great Court Book, C/2/2/2/6, f. 28r., 26 Jun. 1724.
- 68 Sorrell's will dated 3 Nov. 1665, proved 1 Jun. 1670, P.R.O., Prob. 11/333; Clarke 1830, 255.
- 69 Chancery case papers, Russell Collection of Fonnereau Estate papers, S.R.O.I., X1/8/2.4(2), 2.5.
- 70 Assembly Book, C/4/3/1/8 unpaginated: letters of 25 Mar. and 7 May 1828 from Fonnereau's solicitors, entered into the record on 9 Jul., and Assembly resolution of that date.
- 71 Great Court Book, C/2/2/2/7, pp. 149, 154, 8 Sept. and 31 Oct. 1759; lease from Betts to the Corporation, 26 Aug. 1760, DD 2/5/131.
- 72 Redstone 1948, 67; for the names of the streets supplied by the Corporation at this time, see the Chamberlains' water rental for 1788–89, C/5/5/5/19.
- 73 Great Court Book, C/2/2/2/9, f. 82r., 25 Apr. 1833.
- 74 Headboroughs' Verdict Book, C/2/8/4/2, f. 22v., 7 Aug. 1587.
- 75 Assembly Book, C/4/3/1/4, f. 89r., 31 Aug. 1612.
- 76 Water lease, 23 Dec. 1615, C/5/5/2/1.

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*Abbreviations*

- B.L. British Library.  
P.R.O. Public Record Office.  
R.C.M.C. *First Report of the Commissioners on the Municipal Corporations (England and Wales), Appendix, Part IV. Eastern and North Western Circuits, 1835*. London.  
S.R.O.I. Suffolk Record Office, Ipswich Branch.