

SILVERDALE'S WATER SUPPLY

1800 - 1940

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1993

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BURNSALL, GASKELL CLOSE

SILVERDALE, CARNFORTH

LANCS LANCASHIRE.

(01524) 701258.

THE HISTORY OF SILVERDALE'S WATER-SUPPLY 1800-1940

Dissertation presented for the Diploma in Local History  
University of Lancaster

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September 1993

The work contained in this dissertation is submitted solely  
for the University of Lancaster Diploma in Local History

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## ACKNOWLEDGEMENTS

The preparation of this dissertation has been a very enjoyable experience, largely because of the interest and help I have received from so many people. As expected, personnel at the Lancashire Record Office and the Cumbria Record Office have been extremely helpful, and also the staff at Lancaster Public Library. Lancaster City Council staff kindly gave me access to records in their care at Lancaster Town Hall and Morecambe Town Hall. As a newcomer to the area I have particularly appreciated the help given by local people, including John Bolton, Arthur Green and Richard Harward. John Walker supplied much useful information concerning the Waterslack area, and Colin Patrick helped me to understand the geology and hydrogeology of the local limestones. I have also had help from North West Water.

My supervisor, Dr Colin Pooley, has guided and encouraged me throughout the research, and his comments on the shape and structure of the dissertation have been particularly helpful. Finally, Diploma course staff have always been ready to advise and assist, and fellow-students have made many useful comments.

## 1. INTRODUCTION

Silverdale had no mains water-supply until 1938. Before that date its inhabitants and farm animals were dependent on wells and springs, and on rainwater collected from roofs.

The neighbouring village of Arnside had a mains water-supply by 1908, and Carnforth had its own waterworks by 1879. So why was a piped supply so late in arriving in Silverdale? Was it simply the high cost of installing the pipes, especially in a village noted for its rocky subsoil? Or was the existing system of water-supply satisfactory? If the latter, why was a piped supply eventually installed, and who was pressing for this change? These are some of the questions examined in this dissertation. It is also proposed to examine the thesis that rural areas lagged far behind urban areas in the provision of piped water.

Silverdale lies in an undulating area of mixed woodland and pasture adjoining Morecambe Bay (Fig.1 and Photo 1). The present village has a population of about 1600, but in 1911 the population of the township (which at that time did not include Lindeth, the southern part of the village) was only 713. The Yealands, 4 km to the east, at that time had a population of 497, and the nearest town, Carnforth, 6 km to the southeast had a population of over 3000.<sup>1</sup>

Natural water-supplies in Silverdale are very much affected by the presence of limestone rock, which lies close to the surface in the higher parts of the village. It frequently breaks through the thin soil in cliffs and areas of exposed rock or pavement. In contrast with this rocky, dry area there are wet lowlying areas to the south (Leighton Moss - Photo 2) and to the east (Silverdale Moss, Haweswater

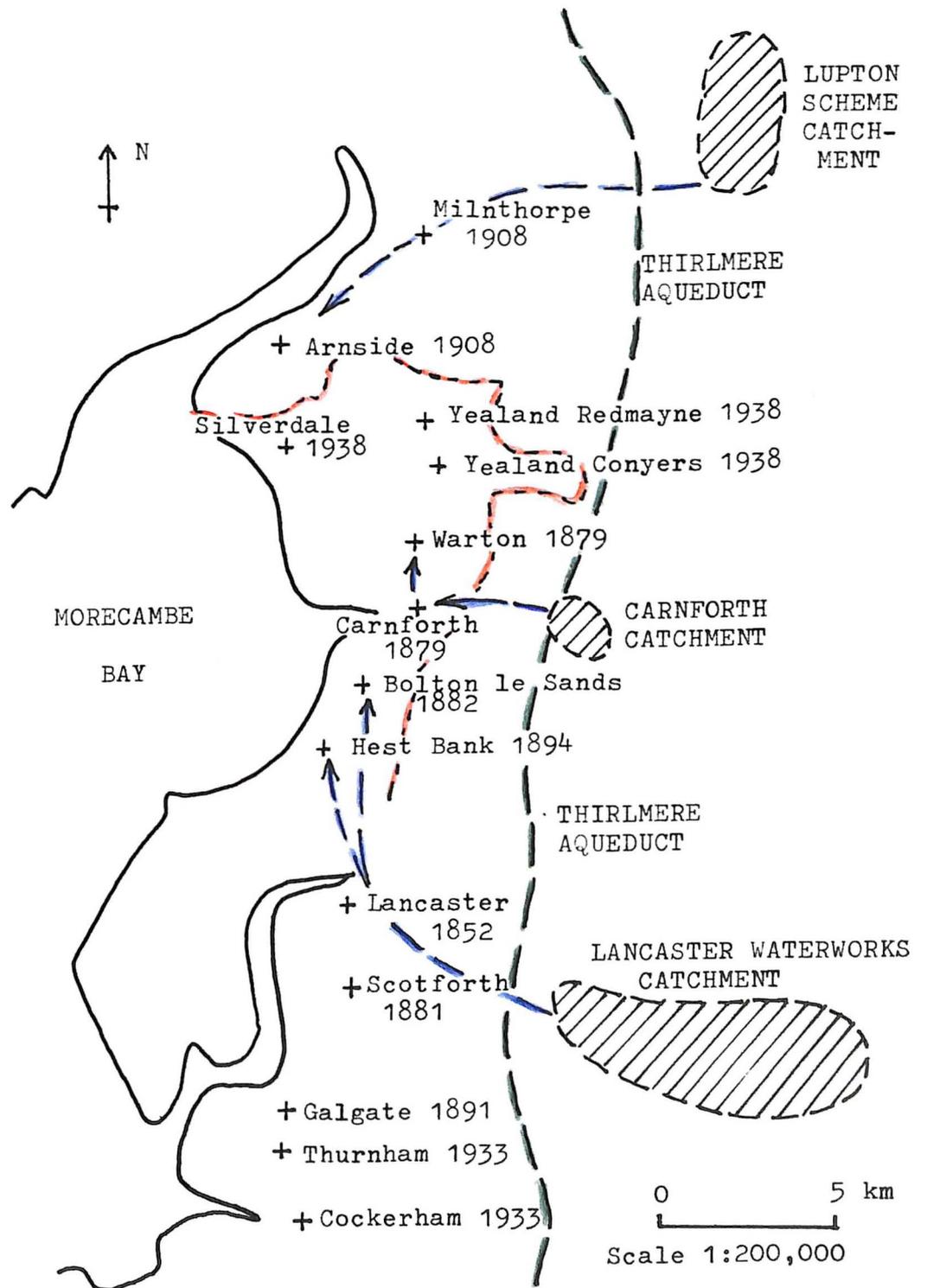


Fig.1 Sketch-map showing the main settlements mentioned in the text, with the dates when they received piped water-supplies.

-  Northern boundary of Lancaster Rural District
-  Pipeline links (diagrammatic)
-  The Thirlmere aqueduct



Photo 1. Undulating ground formed by limestone in the central area of Silverdale. The view north from King William's Hill.



Photo 2. Leighton Moss - one of the permanently wet mosses on the edge of the village. The view from Slackwood Lane.

Moss). Villagers living near these lowlying "mosses" have always had access to a reliable source of water for their farmstock, and for general use, but those living on the higher ground have been reliant on wells and springs, and on rainwater collected from roofs. It was the need to make these water-supplies more hygienic, and available in the quantities consistent with twentieth-century standards of living, that led the local authorities and some of the inhabitants to press for the provision of a piped supply.

Before looking at Silverdale's gradual progression to a piped supply the dissertation considers the development of water-supplies throughout England and Wales, to set the particular situation in a more general context. This is the subject of Chapter 2, while Chapter 3 reviews sources of information and methods of analysis. Analysis of the development of Silverdale's water-supply begins in Chapter 4, with an examination of the balance between local water-supplies and local demand in the days before piped water arrived in the village. Chapter 5 examines the village's wells and watering-places, and the efforts to maintain these in good working order until piped water arrived. Chapter 6 assesses William Dodd's attempts to arrange for piped water, which were decisively rejected at a meeting of ratepayers in 1907. Chapter 7 explains why a piped supply finally came to the village in 1938, and conclusions are presented in Chapter 8. Detailed information is presented in appendices.

During the course of this work the dearth of information on rural water-supply history has become very obvious. It is a neglected topic, deserving much further study to bring it into better balance with the many studies of town water-supply and so give a more

accurate picture of historical changes nationwide.

Note

1. 1911 Census Report.

## 2. THE CONTEXT: WATER-SUPPLY FOR TOWN AND COUNTRY

The growing wealth of Britain during the late 18th and early 19th centuries led eventually to a higher standard of living for most of the population. One of the most basic improvements in living conditions was the provision of sewerage systems and a piped water-supply. But this need was not met in any systematic or organised way. Instead it was neglected until it reached crisis proportions and threatened the health of a large proportion of the population.<sup>1,2</sup>

It can be argued that the rapidly-growing industrial towns of Britain were a new phenomenon, not just for this country but for the world; that industrial Britain paid a price for pioneering the industrial development of the world. But it is difficult to avoid the conclusion that in fact the organising abilities and local government machinery were so weak that problems of sanitation and water-supply remained uncared for until the situation became patently no longer tolerable in a society that considered itself to be civilised and advanced.<sup>3</sup>

Early in the nineteenth century the Census Commissioners had noted that after three decades of steady decline from 1780 to 1810 the death-rate had started to rise again.<sup>4</sup> There could be no doubt about which parts of Britain were responsible for most of this increased death-rate. The new manufacturing towns may have been the wonder of the world, but the living conditions for the poor in those towns were among the worst in the world. Often-quoted statistical evidence highlighted the gross discrepancy between expectation of life in towns and rural areas. Edwin Chadwick in his Report on the Sanitary Condition of the Labouring Population of Great Britain<sup>5</sup> compared the life expectancy of the overcrowded manufacturing population of Manchester with that of the rural population of Rutland. He presented the following comparative table which was

compiled from information collected by Mr J.R.Wood for the  
Statistical Society of Manchester:

Table 1: Average ages of death amongst the different classes of  
people in Manchester and Rutlandshire.<sup>6</sup>

	Average Age of Death (Years)	
	In Manchester	In Rutlandshire
Professional persons and gentry, and their families . . . . .	38	52
Tradesmen and their families (in Rutlandshire farmers and graziers are included with shopkeepers) . .	20	41
Mechanics, labourers and their families . . . . .	17	38

The figures that Chadwick produced for life expectancy in Liverpool  
were even more striking:

Table 2: Age at death in Liverpool, 1840, arranged by classes.<sup>7</sup>

Number of deaths	Average age of deceased	
137	Gentry and professional persons . .	35 years
1738	Tradesmen and their families . . .	22 years
5597	Labourers, mechanics and servants .	15 years

Towns were perceived as the major problem, as in fact they were in  
terms of numbers of deprived people. But there was perhaps a  
tendency to oversimplify the contrast by representing the new  
industrial towns as something strange and abnormal, even alien, while  
the country areas represented stability and normality. Clearly  
the towns were in urgent need of help, but perhaps comparisons such  
as those set out in Tables 1 and 2 above tended to set up the country  
areas as a healthy norm which the towns should strive to reach. In  
fact the country areas had plenty of problems of their own, but  
concentration of effort on the towns tended to lead to some neglect  
of the rural areas. There were also financial reasons for neglect  
of sparsely populated country areas, and by the end of the nineteenth  
century the large towns had improved their sewerage and water-supply  
systems to a standard far above most of the country areas.

Chadwick's Report on the Sanitary Condition of the Labouring Population of Gt. Britain,<sup>2</sup> which was published in 1842, brought widespread publicity to the appalling living conditions of many of the poor in Britain, not only in the towns but also in rural areas. It was clear that the most pressing need was for improved systems of sewage disposal. And here Chadwick had a very practical suggestion. He saw how inefficient was the process of disposal of solid waste, and advocated the installation of underground networks of circular cross-section smooth-glazed earthenware pipes, down which the waste could be flushed with water. The great attraction of this system was the low cost, estimated by Chadwick as one-twentieth of the cost of solid waste disposal.<sup>8</sup> However, the efficient flushing of the solid waste depended on a good supply of water, and so the installation of the new sewerage system happily brought with it the need for supplies of water on a scale very much larger than had been usual.

In the first half of the nineteenth century most of the water supplied to large towns was provided by private companies. By mid-century about half the large towns in Britain were supplied in this way.<sup>9</sup> But these private companies were generally not prepared to venture into the much larger-scale water undertakings that were required to service the new sanitation methods, and borough councils started to take on the work themselves. They were assisted in this by central government legislation in the shape of the Waterworks Clauses Act 1847, which set out a suitable form of legislation for the towns to adopt.<sup>10</sup> By 1901 ninety per cent of the largest towns had municipal waterworks, and four-fifths of consumers were supplied by local authorities.<sup>11</sup>

While water-supplies to the towns were greatly improved, and there were corresponding improvements in health, the rural areas were

comparatively neglected. The Public Health Act 1878 specifically mentioned water-supplies to rural areas, but its provisions in this direction were not very effective. Gradually the economics of water-supply were becoming clearer. While it was feasible to supply a large town with piped water at a very low cost per head, in rural areas the capital cost of laying pipes to connect a scattered population put an intolerable burden on the local rates. When the government reviewed the provision of water to rural areas in 1914 it was found that only 37 per cent of the total of nearly 13,000 rural parishes had piped supplies.<sup>12</sup>

For all water-supply authorities the importance of buying good water-collecting grounds had become apparent. In the north of England the Pennines provided the obvious catchment areas. Large parts of the uplands were bought by municipal waterworks companies, and reservoirs and pipelines constructed. Very soon the larger towns realised that local catchment areas would not be adequate to provide their future needs, and catchments much further afield began to be considered. Manchester, for example, realised that demand for water would soon outstrip the supplies they were obtaining from the Etherow valley. A breed of confident water engineers such as J.F. la Trobe Bateman were convinced that long aqueducts were perfectly feasible, and so Manchester began to look to the Lake District, one hundred miles away, as a source of supply.<sup>13</sup> An atmosphere of competition for catchments began to develop. Liverpool was searching for a major catchment area, and the Royal Commission of 1869 heard the case argued for supplying London with water from the north of England.<sup>14</sup>

There was no overall planning of the allocation of water catchment areas, though water-supply schemes had to obtain Parliamentary approval. There were also technical problems in working out

accurate figures for the yield from catchments, since there was not a sufficiently long run of rainfall data available at that time.<sup>15</sup> Consequently the water-supply authorities tended to err on the safe side and take larger catchments than they required for their immediate needs, arguing that it would always be possible to sell any surplus water at a profit to those smaller authorities who could not afford to raise money for large capital expenditure.<sup>16</sup> In some places the larger authority could be exploiting a catchment area that lay within the boundaries of the smaller authority. And many a parish dependent on well or stream for its own water-supply saw large aqueducts driven through their fields to carry huge volumes of potable water to places perhaps 50 or 60 miles distant.

The 1869 Royal Commission commented that "...no town should be allowed to appropriate a source of supply which naturally and geographically belongs to a town or district nearer such a source, unless under special circumstances..." They also suggested that "...when a town or district is supplied by a line or conduit from a distance, provision ought to be made for the supply of all places along such a line."<sup>17</sup> They were anxious that Parliament should use its influence to modify any schemes submitted to them so as to make them applicable over as wide an area as possible.

One of the first long-distance water-supply schemes to be considered by Parliament following the 1869 Royal Commission Report was the Thirlmere aqueduct linking Manchester with the Lake District.<sup>18</sup> Manchester Corporation set its sights on Thirlmere in 1876 but met with a growing tide of opposition to its plan to alter the lake that had so many associations with Wordsworth and other Lakeland poets. There was immediate opposition to the scheme from local landowners at Thirlmere and along the route of the aqueduct, and they were soon

joined by many who saw the proposed alterations to Thirlmere as a serious threat to an area of exceptional beauty. Well-known national figures such as Ruskin and Carlyle became involved in the struggle, and in Parliament W.E. Forster insisted that the scheme be considered by a special committee of the House of Commons because it was a matter of general public concern.<sup>19</sup>

Thrown onto the defensive, Manchester Corporation sought to devise ways of making the scheme more acceptable, by landscaping and other modifications. Parliamentary approval came, after some delays, in 1879. In the conciliatory mood set by the struggle Manchester Corporation agreed with the 1869 Royal Commission view that, if requested, it should supply water to areas through which the aqueduct passed. Silverdale was one of the villages that later benefited from this arrangement. The Thirlmere aqueduct began to supply Manchester in 1893, but such was the demand for bulk supplies for places along the route that by 1916 the Corporation were looking for a further source of water in the Lake District.<sup>20</sup> In 1918-19 the Corporation tried to repeal that part of the 1879 Act which allowed local authorities to request bulk supplies from the aqueduct, but this was rejected by Parliament.<sup>21</sup>

Tapping water from aqueducts was therefore an alternative option for supplying rural areas with piped water, but so long as each parish was expected to finance its own water provision the capital costs were well beyond the means of many small communities. In a letter to The Times in 1933 "Tantulus" points out that in his village in Yorkshire the cost of providing piped water would add 15 per cent a year to the rates of cottagers. In addition residents would have to pay for the installation of a bathroom, and for connection to the mains supply. Additional charges were proposed for any livestock (5 shillings a year for each horse and 4 shillings for each cow).<sup>22</sup>

The plight of the rural areas was highlighted by the droughts of 1921 and, particularly, 1933-34. Urban areas generally coped well in these droughts, suffering only reduced reservoir levels. But while the towns congratulated themselves on the far-sightedness of their investment in water-supply schemes, in the country areas roofwater tanks were drained dry and wells and streams reduced to a trickle. In September 1933 The Times published a letter recording stories of hardship from all over the country.<sup>23</sup> In East Yorkshire households were paying one shilling a cartload for water to wash clothes, and others were saving water from their washing to pass on to a neighbour. Dairy farmers in Cornwall were denied Grade A milk licences because they had no water for cooling. In Berkshire villagers were paying threepence a bucket for water (topped by a story from another correspondent of one shilling a bucket paid in the Taunton area in the 1911 drought).<sup>24</sup>

The contrast between town and country must have appeared particularly noticeable to the increasing numbers of town dwellers who now visited rural areas. The position was put starkly by Sir J.Q.Lamb, Member of Parliament for Stone, when he asked in the House of Commons "Is it not a fact that large quantities of water have already gone into the cities leaving the countryside absolutely destitute?"<sup>25</sup>

There were still many who argued that adequate arrangements could be made in rural areas without piped water. Mr C.A.Radice suggested that roofwater supplies could be perfectly satisfactory.<sup>26</sup> Others showed how small artificial catchments made from corrugated iron could provide a village supply.<sup>27</sup> And it was even suggested that if piped water were to be supplied to rural communities and the regular routine of carrying water from the well obviated, there would not be the same personal incentive to exercise care in the use of water.<sup>28</sup>

It was also fair to point out that if instructions to Rural District Councils had been carried out correctly, no house constructed after 1878 should have been given approval unless it had adequate water-supply arrangements.<sup>29</sup>

But the mood in Parliament was that financial assistance should be given to rural communities to help them to catch up with the standard of water provision long enjoyed by the towns. A first step was taken in the Local Government Act of 1929, which allowed the wealthier parishes in a Rural District to subsidise piped water-supplies for the poorer parishes in the same District. The severe drought of 1933-34 finally brought the decision to introduce an element of central government subsidy for water-supply. The government made one million pounds available in England and Wales to assist with the capital costs of water-supply schemes. No central government money would be forthcoming unless the Rural District Council and the County Council also made a contribution. The Rural Water Supplies Act was not a political issue and it was speedily put through Parliament, receiving the Royal Assent in July 1934.

It was now possible for a large number of rural communities to surmount the barrier of high capital cost, and very many proceeded to obtain their piped water, in time to cope with the drought of 1940-41. Among these was Silverdale. Further legislation in the 1940s led to greater planning of water resources, and the establishment of locally important pipeline links to cope with local shortages.

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29. The Times Newspaper, 18 September 1933, p.8, col.6.

### 3. SOURCES AND METHODS

The earliest documentary evidence concerning Silverdale's water-supply appears to be the Enclosure Award of 1817, which gives details of the enclosure of almost all the common land that remained in the township at that time. Special provision had to be made to maintain access to several of the public water sources, and details of these were included in the text and plan of the Enclosure Award.

How Silverdale supplied itself with water in the centuries preceding 1800 has to be a matter of some well-informed speculation. We have a good idea of the settlement pattern, and that was presumably controlled partly by access to water. We also have some knowledge of the geology of the water sources and can decide which water-supplies have always been accessible, and which required the construction of wells.

The Silverdale Enclosure Award placed responsibility for maintenance of specified wells and watering-places with the township officials. No township records concerned with water-supply have been found for the first decades of the nineteenth century, but in 1838 a select vestry of "substantial householders" of Silverdale was set up, and their minute-book survives at the Lancashire Record Office. A few entries are concerned with water-supply.

In 1872 the Lancaster Rural Sanitary Authority was set up, with responsibility for the health of the villages around Lancaster, including Silverdale. In 1891 the Silverdale Ratepayers meeting asked the Rural Sanitary Authority to take charge of the township wells and pumps, but the day-to-day maintenance remained with the Ratepayers. Following local government reform a Silverdale Parish Meeting was called, and this set up the Silverdale Parish Council in

1894. The Parish Council took over from the Ratepayers meeting, and their minute books contain numerous references to the maintenance of the wells and watering-places and the provision of access to them. A complete set of Parish Council minute books is available at the Lancashire Record Office, as well as the minutes of the Annual Parish Meetings.

By a quirk of ancient township boundary allocation the southern third of what is now regarded as Silverdale was formerly administered (as Lindeth) by the Warton with Lindeth Parish Council. Consequently a second set of parish records had to be examined to provide coverage of this part of the village. Warton with Lindeth Parish Council Minute Books and Warton Parish Meeting Minute Books are available at the Lancashire Record Office, but they are much less detailed than the corresponding Silverdale documents.

Many of the matters raised in the Parish Council minute books are also referred to in the minute books of the Lancaster Rural Sanitary Authority. A set of these covering the complete lifetime of the Sanitary Authority (1872 to 1896) is preserved at Lancashire Record Office. There are also Clerk's Letter Books for the Authority for the period 1881 to 1895, and these contain a few relevant details.

Local government reforms of the last decade of the nineteenth century led to the establishment of the Lancaster Rural District Council, which took over the functions of the Rural Sanitary Authority for health matters. The Rural District Council Minute Books are held by Lancaster City Council and have been examined at Lancaster Town Hall. Some of the Rural District Council Clerk's Letter Books can be seen at the Lancashire Record Office and they contain occasional references to water-supply.

The greatest value of the documents of the Rural Sanitary Authority and the Rural District Council is in tracing the development of water-supply to the area as a whole. Silverdale is not often mentioned, as there were preoccupations with other areas. Minute books are always susceptible to heavy editing, and this is particularly true of the Rural District Council minutes in the late 1890s and early 1900s, when the Council were criticised for failing to support their officers, and not keeping a full record of proceedings.<sup>1</sup> Silverdale's attempt to join in the Lupton water-supply scheme has been traced also in the minutes of the South Westmorland Rural District Council, held at the Cumbria Record Office at Kendal.

The bulk of the information in this dissertation has been collected from the minute books and letter books listed above, amounting to some 15,000 pages in all.

Reports of the Medical Officer of Health to the Lancaster Sanitary Authority and the Lancaster Rural District Council proved difficult to locate, but those for the period 1890 to 1919 were examined in the council offices at Morecambe Town Hall.

Lancaster Public Library Reference Department has proved a valuable source of information. References in their newspaper index have led to some very relevant items from the Lancaster Guardian. Items in their manuscript collection include contract documents for the pipeline to Silverdale, and water-meter records for supplies from the Thirlmere aqueduct.

Colin Patrick, of Lancaster University, has helped with some of the geological aspects of Silverdale's water-supply. Mr John Walker supplied much useful information concerning Waterslack Farm, and Mr John Bolton has helped with informative comments on the general

historical background of the village. Some details of the use of wells and the running of roofwater systems have been supplied by the ever-helpful inhabitants of the village.

Background information on the history of water-supply nationally has been found in a great variety of published sources, which are listed in the bibliography. Nearly all are heavily biased to the story of urban supplies rather than rural supplies. The Times newspaper has proved a useful source in providing details of the drought crises which precipitated government action in the 1930s.

All the sources are listed in the Bibliography (Chapter 9).

#### Note

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#### 4. SUPPLY AND DEMAND

##### Supply

Silverdale is generally considered to lack natural water resources, but in one sense it has an abundance of water. The annual rainfall is about 114 cm (45 in.),<sup>1</sup> which over the four square kilometre area of the village amounts to an annual input of about 4,100 million litres (900 million gallons), equivalent to about two weeks flow from Manchester's Haweswater Reservoir. There are practically no surface streams in the village, so nearly all of this rainfall must sink into the ground and flow down through the joints in the limestone rock below. The bulk of the flow in the rock-joints reaches the main water-table which stands a few metres above sea-level (Fig.2). But thin mudstone bands in the limestone prevent this downward flow in a few places, and so perched water-tables are formed. These can lead to the formation of surface springs such as Woodwell.<sup>2</sup> Other surface seepages may result from blockage of the fissured limestone by windblown silt or by boulder clay close to ground surface. But the volume of water emerging at the surface from perched water-tables is a tiny fraction of the total precipitation (probably of the order of 4.5 to 9 million litres a year, or 0.1 to 0.2% of the total precipitation)<sup>3</sup> Where groundwater is brought to the surface by perched water-tables it usually sinks again within a short distance of its emergence, though the flow from Woodwell travels 400 metres, and that from Burton Well 200 metres.

The water that passes down through the rock to the main water-table within the limestone issues from large springs on the low ground that surrounds Silverdale - on the shore of Morecambe Bay, and near Silverdale Moss, Haweswater Moss and Leighton Moss. There is

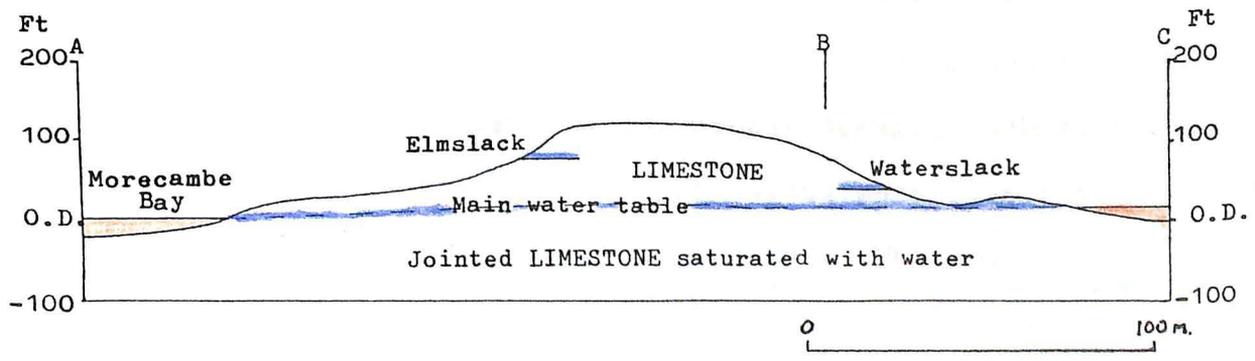
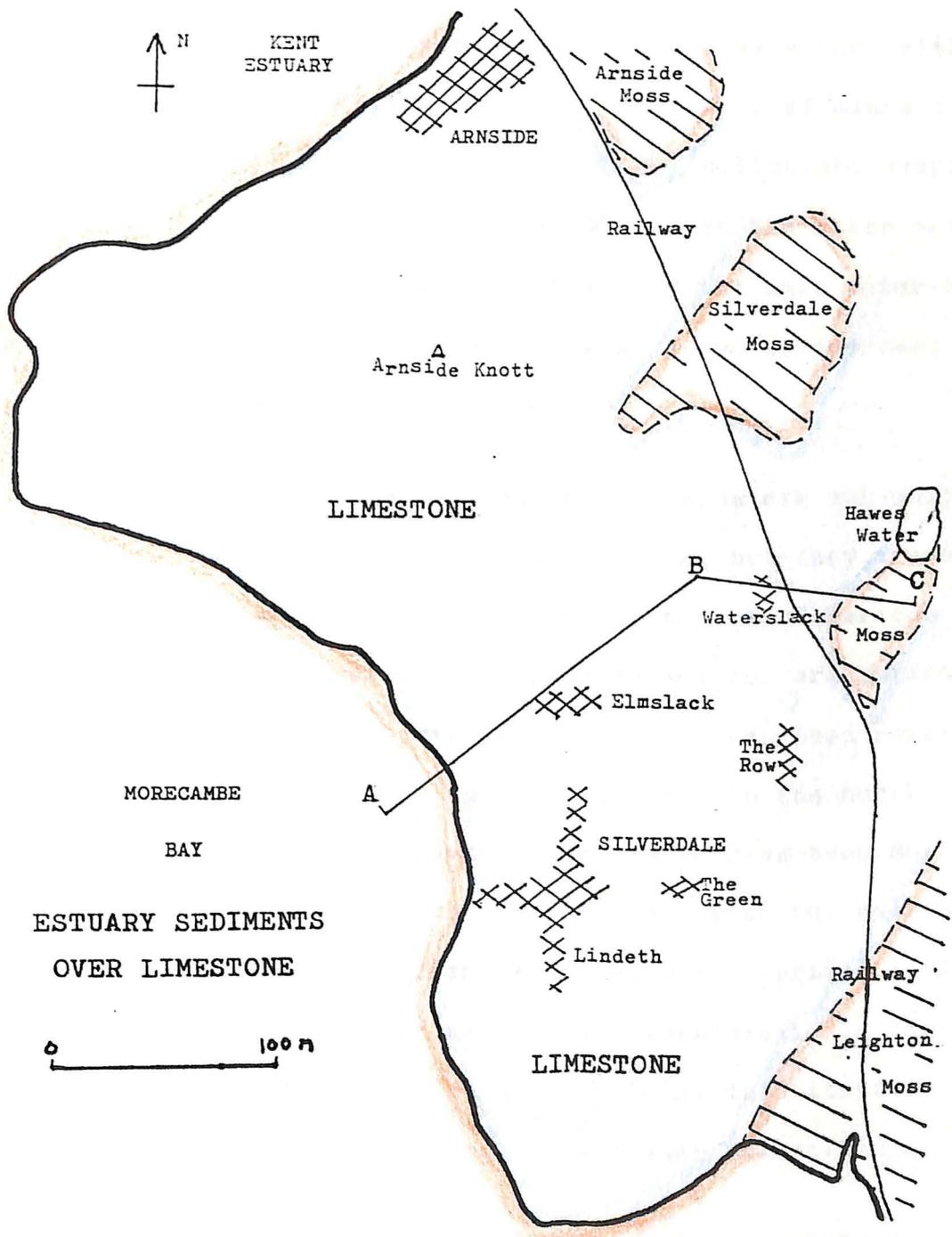


Fig.2 The Arnside-Silverdale area, showing the higher ground formed by limestone, and the mosses to the east and south of Silverdale. Section A-B-C is from The Cove through King William's Hill and to Haweswater Moss. Perched water-tables form springs at Elmslack and Waterslack.

consequently no shortage of water in these peripheral areas, although water from the main water-table is likely to be polluted since it underlies the whole village and will collect any pollutants seeping down through the limestone joints. Near the coast the water may be saline. Water flowing from sources supplied by the main water-table doesn't sink into the ground again but remains in water-courses, ponds and lakes around the edge of the village.

By contrast the issues from the perched water-tables are not only very much smaller than those from the main water-table, but they are also likely to be much reduced or even to dry up in prolonged periods of dry weather. Most of the perched water-table sources are surface issues, but in some places the perched water-table has been reached by digging shallow wells, such as that at Elmslack in the north of the village. Perhaps the places where such wells have been dug once had surface springs at a time in the distant past when the rainfall was much greater than now. Or changes to natural materials filling rock fissures may have caused a lowering of water-level. In these circumstances wells may have originated when local inhabitants excavated into the rock to keep access to a falling water-table.<sup>4</sup>

Storage of spring water has always been an important feature of water management in the village. Woodwell produces a winter flow of about 5 litres (nearly one gallon) a minute, or over 6400 litres (1400 gallons) per day.<sup>5</sup> To provide for sudden demand, such as the arrival of a herd of cows, watertight basins were constructed close to the well, and one of these still survives (Photo 4). The two basins at Woodwell shown on the 1845 Ordnance Survey six-inch to the mile map have a surface area estimated very roughly at 145 sq.m.<sup>6</sup> If filled 60 cm. deep these would hold 87,000 litres (about 19,000 gallons). A set of three large covered storage tanks collecting a

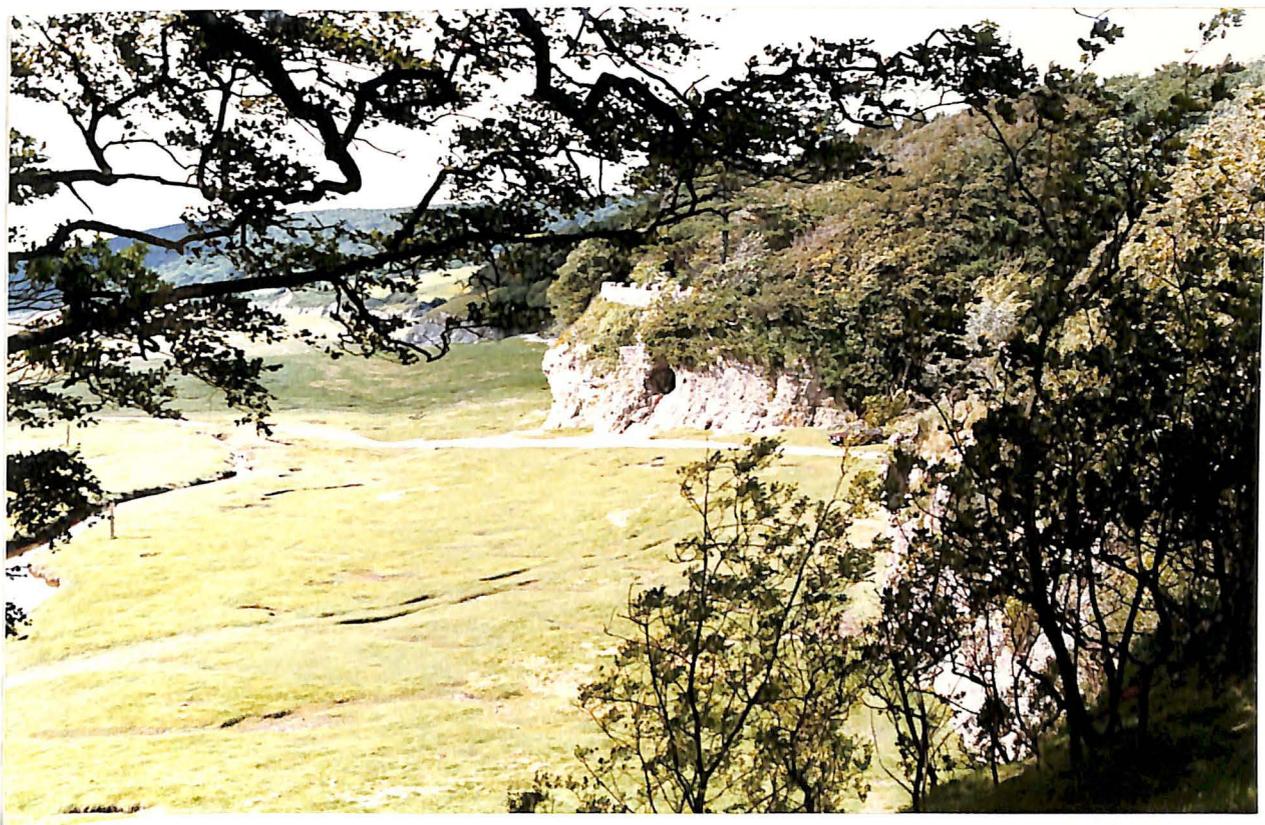


Photo 3. Limestone cliffs at The Cove, Silverdale. Grass-covered estuarine deposits of Morecambe Bay in the foreground.



Photo 4. The remaining water-storage basin at Woodwell.

private water-supply for Woodlands, a house on the north edge of the village, have a capacity of approximately 230,000 litres (50,000 gallons)<sup>7</sup> (Photos 5 and 6).

Since the natural ground is such a poor interceptor of rainfall in Silverdale the collection of rainwater from roofs has been of enormous importance. There is no source of roofing stone in the village or the immediate area, so it seems likely that straw, flax or reed thatch would be the usual roof-covering before the nineteenth century. Collection of rainwater from a thatched roof would be difficult, though it is possible that wooden gutters could be fitted.<sup>8</sup> A report prepared in 1902 on health within the Lancaster Rural District notes disapprovingly that some rainwater was being collected from "dilapidated thatch roofs." The locations are not recorded.<sup>9</sup> Slates were probably first used on a few of the larger houses, such as Cove House in Silverdale, but it was probably not until the railway arrived in mid-century that slates became generally available at a reasonable cost. When gutters had been added to a slate roof, and storage tanks constructed, the water-supply arrangements for individual houses in the village were transformed. For many the resulting system was cheap and reasonably reliable, and they saw no need for piped water, even in the twentieth century.

A typical late-Victorian or Edwardian semi-detached house such as those at the north end of Lindeth Road has a roof measuring about 9 by 9 metres, and with average rainfall should yield well over 80,000 litres per year (about 17,000 gallons).<sup>10</sup> Before a newly-built house could be occupied it had to obtain a "Water Certificate" from the Rural Sanitary Authority (and later from the Rural District Council). This stipulated the size of water-storage tank that must be provided. A house fitted with a bath and a water closet had to



Photos 5 and 6. The large tanks that used to store spring-water (collected from the adjacent hillside), to provide a supply for Woodlands, Silverdale. View from the west (above) and from the east (below).

have a covered tank with a capacity of at least 13,000 litres (3,000 gallons). A tank of this size could in theory be filled from empty by 2 cm (0.8 inch) of rain falling on a 9 by 9 metre roof.<sup>11</sup> (Photo 7).

Farm buildings provided much larger roof areas for collecting rainwater. At Waterslack Farm there was an estimated roof area of over 300 sq.m. for the farmhouse and outbuildings in the early years of this century. This could have yielded about 350,000 litres (77,000 gallons) of water each year.<sup>12</sup> Four stone-built cement-rendered tanks gave a storage capacity of about 45,000 to 50,000 litres (10,000 to 12,000 gallons).<sup>13</sup> A well-constructed roof-water system could be expensive to install. A report of 1902 refers to tanks at two farms at Yealand costing over £150. The same report notes that at other farms any sort of container is used to collect water, including "...tubs, pans, barrels, old boilers...".<sup>14</sup> (Photo 8).

Dew-ponds are frequently used in limestone areas to provide water for farmstock (they are common in Derbyshire and on the Chalk Downs), but I have found no record of their use in Silverdale. This may be due to the lack of a good waterproof clay locally to provide a lining, or it may be a reflection of the fact that abundant supplies of water were available around the periphery of the village.

### Demand

From the perspective of the last decade of the twentieth century it is easy to get a totally misleading idea of the level of demand for water in a rural community at the beginning of the nineteenth century. Not only was the population of Silverdale at that time only about one-tenth of its present size, but the average domestic consumption of



Photo 7. Gutter on the gable-end of a house in Cove Road. The gutter is still in its original position, designed to carry water from the front roof to a storage tank at the back of the house.



Photo 8. Waterslack Farm. The base of a dismantled roofwater storage tank, later adapted as a farm building, and now a sitting-out area. The trough to the right was filled from the tank, to water farm stock.

water was very low - perhaps one-tenth of the present consumption per head. Balchin has estimated that consumption of water in 1830 was about 18 litres (4 gallons) per head each day.<sup>15</sup> The population of Silverdale township was only 171 in 1801 (Fig.3), and we can estimate that the number of houses was about 40 (by comparing the census figures for 1841, when a population of 252 lived in 53 houses).<sup>16</sup> If Lindeth is added then the total would rise to an estimated 200 or so inhabitants in 50 houses. This population would need perhaps only 3600 litres (800 gallons) a day for domestic use.

Provision for watering livestock is more difficult to estimate. Cows and horses need about 10 gallons of water a day, but sheep can usually obtain sufficient moisture for their needs from the moisture in grass, occasionally dampened by rain or dew.<sup>17</sup> Sheep need some additional water when lambing. We do not know how many cows and horses there were in Silverdale in 1801, but it is unlikely that they outnumbered the human population, so that the total water needs of the village could probably be met by less than 9,000 litres (2,000 gallons) each day.

This amount of water could easily be supplied by the wells and springs in the village. The peripheral issues from the main water-table produce much more than this and are not susceptible to drought. The smaller issues and wells fed by perched water-tables in the higher part of the village would be able to sustain this level of supply on their own in winter, but would be much reduced in flow during any prolonged periods of dry weather. Woodwell alone has a winter flow estimated by the writer at about 6,500 litres a day (1400 gallons), nearly sufficient to provide the needs of the whole village in 1801. The importance and reliability of this particular well is indicated by the provision of adjoining basins where stock could be watered.

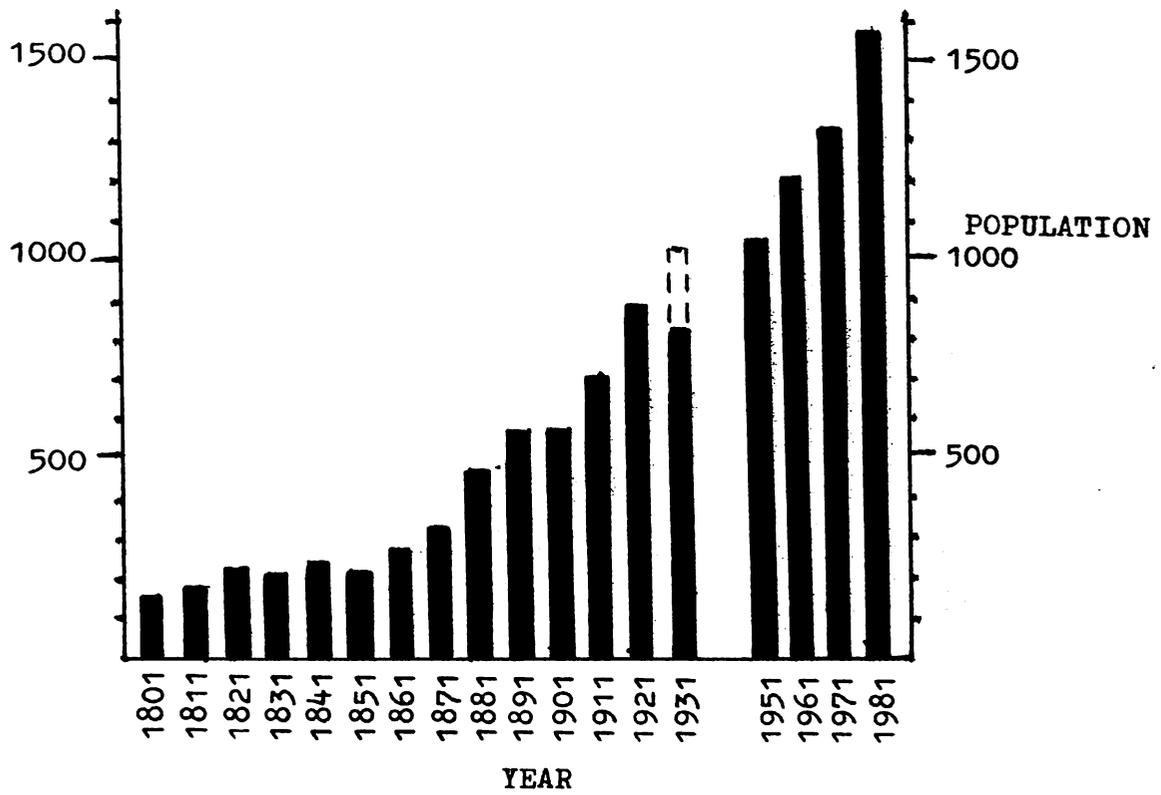


Fig.3. The population of Silverdale from 1801 to 1981 (data from Census Returns). From 1951 to 1981 Lindeth is included in the total. The broken line at the top of the 1931 column shows the total for that year including Lindeth.

It is even reputed to have been used to water cattle that had been driven across Morecambe Bay.

While it is true that there was abundant water available at all times of year around the periphery of the village, most people needed to settle close to the limited amounts of cultivable land, and these tended to be in the higher parts of the village. Settlement in these higher parts made the inhabitants dependent on the smaller, less reliable perched water-table springs and wells. Examination of the Silverdale Tithe Map of 1846,<sup>18</sup> or the Ordnance Survey six-inch to the mile map of 1845,<sup>19</sup> shows that at that time most of the villagers who lived in the higher parts of the village occupied cottages that were clustered around sources of public water-supply from the perched water-tables (Fig.4). This is particularly evident with the small communities at Elmslack (close to Elmslack Well), The Row (close to Bank Well and Dogslack Well), and The Green (close to Stankelt Well and Burton Well). It seems probable that this inner group of perched water-table wells were perfectly adequate for the mid-1840s population, which was still only about 250 in Silverdale Township, and probably less than 300 even when Lindeth was added.(Fig.3).<sup>20</sup> In droughts the inhabitants would have to rely on peripheral springs, and stock may have been driven to the parish watering-places. Many farms and houses that were distant from the public wells had private wells on their land.<sup>21</sup>

Between 1801 and 1901 the population of Silverdale increased by 340%.<sup>22</sup> (Fig.3). A part of this increase occurred in the first two decades of the century, but most occurred after the arrival of the railway in mid-century. For four decades after the railway was built the population rose, culminating in a 40% rise in population between 1871 and 1881 and a 20% rise between 1881 and 1891.<sup>23</sup> Some of this

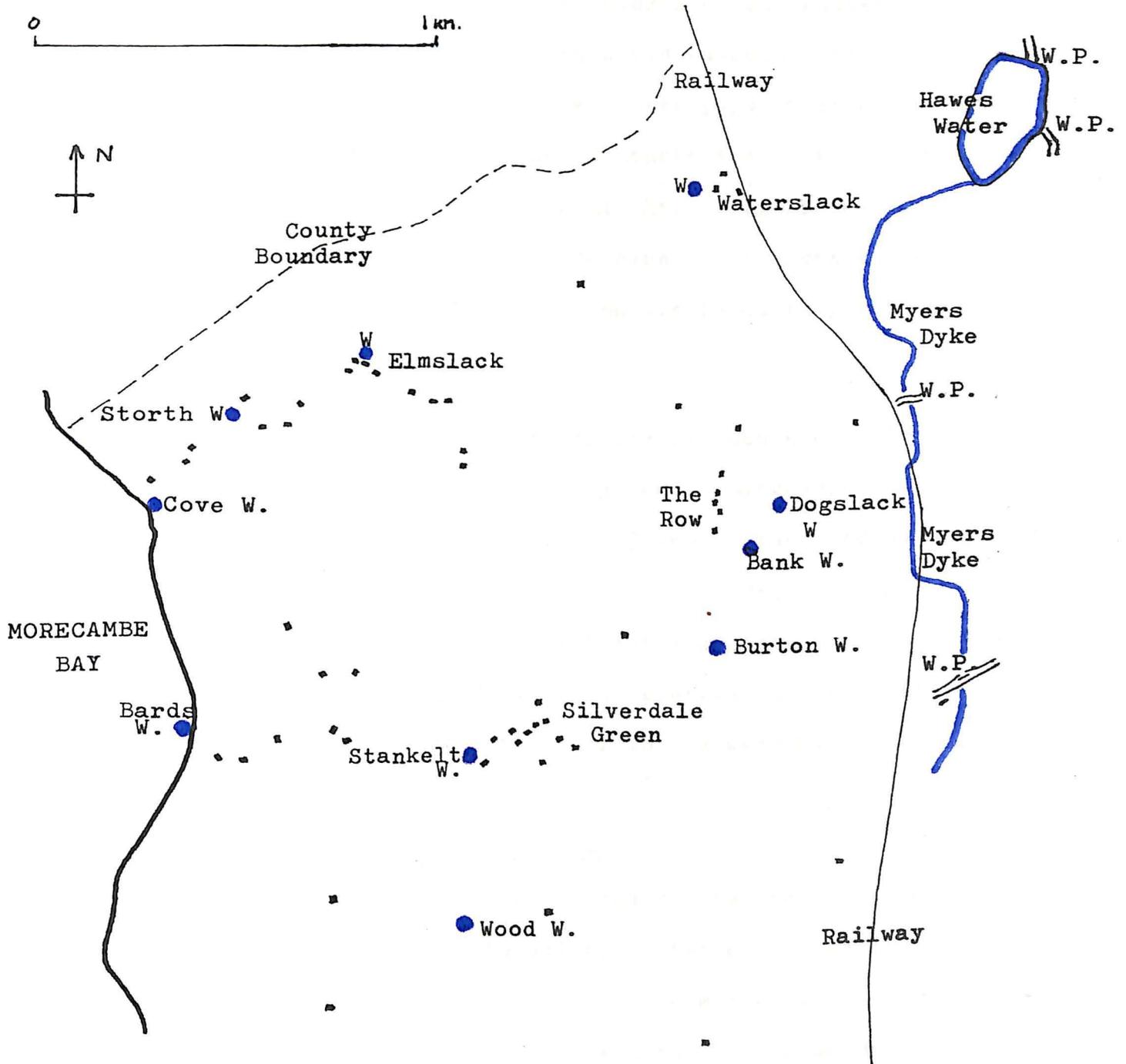


Fig.4. Silverdale houses and farms shown on the 1845 six-inch to the mile Ordnance Survey map, together with public wells (W) and watering-places (W.P.).

increase was due to in-migration of middle-class residents, who were building substantial houses. There would therefore be a greatly increased demand for water from the larger population as well as from an increased consumption per head of population. It is very doubtful whether this population increase could have been sustained had the railway not also brought with it the benefit of cheap slates and cast-iron guttering which made it possible to develop very efficient supplies of roofwater.

By the end of the nineteenth century the residents of Silverdale had invested very heavily in roofwater systems. Large-scale Ordnance Survey plans published in 1893 and 1913 show "tanks" adjoining houses and farms all over the village.<sup>24,25</sup> Many a newly-arrived resident in Silverdale in the late twentieth century is astonished to discover these large, redundant cement-rendered structures beneath their kitchen floorboards, or in the garden.

#### The balance between supply and demand

Although Silverdale, in 1900, had responded to the increased water needs of its population by installing roofwater collecting systems, these had two serious deficiencies. The distribution of the supply was uneven, and the system was very susceptible to drought.

While it can be shown that the theoretical roof-collecting potential of the village was very high at this date (perhaps some 55,000 litres per day, or 12,000 gallons),<sup>26</sup> this supply was very unevenly distributed between households owing to differences in roof sizes. Figures for demand are difficult to determine, since much consumption depends on ease of access to supplies. For example, a flushing water closet or a water-heating system add greatly to demand.<sup>27</sup> In other words, demand is related to the standard of living. However, we do

know that during negotiations for piped water in 1907-8 a supply of 135,000 litres a day (30,000 gallons) was under consideration, and this no doubt allowed for some increase in future consumption.<sup>28</sup> The figure of 135,000 litres a day is more than double the volume being supplied at that time by roofwater. The same negotiations suggested that a supply of 102 litres (22.5 gallons) per head per day was adequate.<sup>29</sup> This amount would require a roof-collecting area of 33 sq.m. per head of population. The average household consisted of four persons at this time,<sup>30</sup> so for a typical family a total roof area of 132 sq.m. would be needed. Many cottages in Silverdale had only 36 sq.m. of roof. The data are more fully explored in Appendix B.

The most obvious deficiency of the roofwater system is its dependence on regular rainfall. Local authority approved tanks seem to have been designed to hold about 30 days water-supply. But in periods of wet weather water would run to waste, and in droughts many of the population had to carry water from the village wells<sup>31</sup> or cart water from the local Haweswater Lake.<sup>32</sup> It was particularly at times of drought that England's rural areas felt that they were far behind the towns in standard of living.

### Notes

1. Water Resources Board. Morecambe Bay Barrage, Desk Study. July 1966. Alexander Gibb and Partners.
2. Some of this information is from Colin Patrick, University of Lancaster.
3. My own estimate, based on flow measured at Woodwell in February 1993.
4. My own speculation.
5. My own measurement of the flow, in February 1993.
6. O.S. Map 6", Lancs. sheet 18.
7. Based on my own measurements.
8. Suggested by Marion McClintock, University of Lancaster.

9. F.St.G.Mivart. Report to the Local Government Board on the General Sanitary Circumstances and Administration of the Lancaster Rural District. H.M.S.O. (1902), p.5. Copy in the Mourholme Society Archive.
10. My own calculation - see Appendix B, p.79.
11. See calculations in Appendix B.
12. My own estimate.
13. The tanks were located for me by Mr John Walker, and I have measured them and made this estimate of their capacity.
14. F.St.G.Mivart. Report to the Local Government Board on the General Sanitary Circumstances and Administration of the Lancaster Rural District. H.M.S.O. (1902), p.6.
15. W.G.V.Balchin. 'A Water Use Survey', Geographical Journal, 124 (1958), p.476.
16. 1841 Census Report.
17. Information from Richard Harward of Bank House Farm, Silverdale.
18. The Silverdale Tithe Award Map.
19. O.S.Map 6", Lancs. sheet 18 (1845 edition).
20. 1841 and 1851 Census Reports.
21. Bank House Farm had a well close to the farm buildings, for example. Many examples of private wells can be seen on O.S.plans.
22. Census Reports.
23. Census Reports.
24. O.S.Plan 25", Lancs. sheet 18/10 (1893 edition).
25. O.S.Plan 25", Lancs. sheet 18/10 (1913 edition).
26. My own estimate - see Appendix B.
27. Keith Smith. Water Supply in Britain: a Study in Applied Hydrology and Resource Geography, MacMillan (1972), p.138.
28. Lancashire Record Office PR 5031/1/1 p.28 (Silverdale Annual Parish Meeting Minutes for 10 December 1910).
29. Lancashire Record Office RDLA 2/4 p.73 (Rural District Council Clerk's letterbook: letter to A.Milne, Clerk to Guardians, Kendal, 2nd March 1908).
30. 1901 Census Report.
31. Information from Mr Horton of Lindeth, and Mrs Letcher of Gaskell Close, Silverdale. Mrs Letcher recalls that filling containers at Woodwell was a very time-consuming process, since the only

reliably pure water was that running from the overhanging limestone. At times of drought there were many people filling containers at this source. The water in the tanks below the well was not considered clean enough to use. (Photo 9.)

32. Information from Mr John Walker. Water had to be carted from Haweswater for the stock at Waterslack Farm.



Photo 9. Woodwell. Water trickles from the overhanging rock, and it is this source that many villagers relied on when periods of drought emptied their roofwater tanks. Water collecting in the small basin below the rock was not considered pure enough to use for drinking-water. The large basin a few metres from the rock face was used for watering stock (see Photo 4).

## 5. WELLS AND WATERING-PLACES

The wells and watering-places of Silverdale have always attracted a lot of attention, partly no doubt because of their picturesque situations. This chapter deals mainly with the public wells, and describes how they were maintained until the arrival of piped water made them superfluous as a source of water for the village. The earliest documentary information on the wells and watering-places is contained in the Enclosure Awards of 1817.<sup>1,2</sup>

### The Enclosure Awards

The decision to enclose further areas of common land in the Townships of Silverdale and of Warton with Lindeth threatened access to many of the customary wells and watering-places of the village. Consequently the Commissioners were careful to specify those public wells and watering-places where access should continue to be assured, for watering livestock as well as providing drinking-water for many of the inhabitants. The list of wells is set out "... as and for a public watering place or places for the cattle of or belonging to the Owners or Occupiers of Messuages, Land or Tenements within the said Township and for such Owners and Occupiers themselves to take water at or fetch water from..."<sup>3</sup> Just as important as specifying the wells and watering-places was the need to ensure public access. At many of the wells this meant the provision of special access tracks or paths.

Since the Enclosure Awards contain the first reliable listing of most of Silverdale's public water-sources they are set out in Table 3, overleaf. Of the water-sources mentioned in the Silverdale Award most needed special access tracks after enclosure. Only Cove Well, Bank Well

and the watering-places on Myers Dyke were unaffected. As for the wells mentioned in the Warton with Lindeth Award, Wood Well required a special access road. The locations of the wells are shown on Fig.4.

Table 3: Wells and Watering-places listed in the Enclosure Awards Listed in the Silverdale Enclosure Award of 1817<sup>4</sup>

Wells: Storth Well (with 33 perches of land)  
Waterslack Well (with 11 perches of land)  
Cove Well (with 8 perches of land)  
Dogslack Well (with 1 perch of land)  
Burton Well (with 6 perches of land)  
And a half of Bank Well (with 16 perches of land)

Watering-places:

Myers Dyke, near Redbridge  
Myers Dyke, on Yealand Road  
Hawes Water, 3 perches on the north side  
Hawes Water, 3 perches on the east side

Listed in the Warton with Lindeth Enclosure Award of 1817<sup>5</sup>

Wells: Wood Well (with one acre and fifteen perches)  
Bard Well (with 17 perches)  
And a half of the spring called Bank Well, containing 8 perches.

The Warton with Lindeth Award ordered and directed that "the said several public watering places so set out by us as aforesaid shall from time to time and for ever hereafter be well and sufficiently cleansed scoured and repaired by the surveyors of the Highways of the said Township of Warton with Lindeth." <sup>6</sup> The two responsibilities of keeping access to the wells for the public, and maintaining the wells in good condition remained a time-consuming duty for those charged with the work.

The list of wells and watering-places in the Enclosure Awards is not a full list of the wells and watering-places in the townships. In the first place the awards are only concerned with public water-sources.

And in the second place, the land dealt with in the Awards is only part of the Township area. Public wells such as those at Elmslack and Stankelt were outside the Enclosure Award area and are not mentioned.

The importance of the well-listing in the Award documents is attested by the large number of occasions on which the documents are referred to during later disputes over access.

Wells and watering-places the responsibility of the township 1817-1892

The Enclosure Awards had laid specific responsibilities on the township officials to maintain the public water-supply. No evidence has survived to tell us whether this responsibility was conscientiously discharged. It appears to have been other matters that prompted the public meeting of ratepayers on 11th July 1838 when it was resolved to establish a Select Vestry for Silverdale. Property had been left "for the use of the township", and it had to be established whether this could be auctioned.<sup>7</sup>

In 1853 there was evidently some dissatisfaction with the state of the wells in Silverdale since the Ratepayers Minute Book records that at a public meeting the following motion was passed: "...that the Surveyors be ordered to put the Pump at the Cove in Immediate repairs and also all the watering places in the Township."<sup>8</sup>

Further concern was roused in 1856 when it was realised how disruptive the construction of the proposed railway through Silverdale might be. At a public meeting on the 20th of June 1856 it was proposed that "...the Surveyors duly elected to serve for this year have the full power to exercise their abilities in preventing any Encroachment by the Railway Company or other parties in deteriorating any Roads, Watering places, Wells etc. belonging to the Township..."<sup>9</sup>

The immediate concerns resulting from railway construction are revealed in minutes of a meeting held on 3rd December 1856 when the Ratepayers proposed that the Railway Company should bring water from the spring at Waterslack in pipes under the railway to a stone trough on the public road 150 yards away.<sup>10</sup> By way of persuasion the Township was prepared to withdraw an indictment that was held against the Company if they should agree to the list of requests. The Furness Railway agreed to install the pipe and the trough, no doubt quite readily, since their tracks cut through the public right of way to the Waterslack Well, and if livestock were to continue to use this access to the well the railway company would have been obliged to provide a keeper to look after the level crossing gates.

How well the arrangements at Waterslack worked is not known, for the next we hear of it is in 1893 when there were complaints that the water intended for the roadside trough was being diverted for the use of local farms.<sup>11</sup> This dispute rumbled on through the 1890s and recurred in 1911 - significantly a drought year when the trough may have been needed for watering stock. No resolution of the dispute is recorded, and by the 1930s the pipe from the well was regarded by the tenant at Waterslack Farm as part of his normal water-supply arrangements.<sup>12</sup>

In 1872 the Lancaster Rural Sanitary Authority was set up to take care of health matters in a broad tract of land around Lancaster Borough, including Silverdale. The immediate concern of the Authority was with the more urban areas of its territory, such as Carnforth. With the help of their very diligent Inspector of Nuisances, Jeremiah Jowett, the trouble spots were identified and schemes for sewage disposal and water-supply were drawn up.<sup>13</sup> Silverdale is barely mentioned in the Authority's minute book until 1891, when the Silverdale Ratepayers

asked the Rural Sanitary Authority to take over responsibility for the township's wells and watering-places.<sup>14,15</sup> Mr Jowett was taken on a conducted tour of inspection of the wells in November 1892, and was evidently reasonably satisfied with their condition.<sup>16</sup> In January 1893 he asked the Sanitary Authority for £15 to put the Silverdale wells in good working order.<sup>17</sup>

The responsibility for day-today maintenance of the wells remained with the Ratepayers, and after local government re-organisation with the Parish Council from 1894. The Parish Council minute-books contain well over a hundred references to maintenance problems up to the time that the wells were superseded by piped water. Nearly all these references are concerned with repairs and cleaning, or with access. (See Appendix F.)

The wells varied considerably in construction. Some were simply small springs that flowed directly into concrete basins that facilitated water-collection (Storth Well, Waterslack Well). Others were true wells where the water did not appear naturally at ground level, and a pump had to be installed (Cove Well, Elmslack Well, Dogslack Well). At Burton Well the water issued naturally at ground level and was directed into a large cement-rendered, stone-built tank which was covered by a corrugated iron roof to keep out leaves. A door in the cover gave access to that a bucket could be lowered into the water, but later a pump was installed (Photos 10 and 11).<sup>18</sup>

The pumps required frequent repairs, and occasionally there were problems with pumps freezing. The pump at Dogslack Well was insulated against frost in 1929,<sup>19</sup> but when frost threatened to damage the pump at Burton Well in January 1914 the problem was dealt with by removing the pump during cold periods.<sup>20</sup> The latter is one of several



Photo 10. Burton Well in 1993. It is believed that it formerly had a cover like the one shown in Photo 11, below.



Photo 11. A covered water-tank in a field adjacent to Cove Lane, Silverdale. Possibly originally used for collecting water that drained off Cove Lane.

comments which imply that the wells were not used very regularly. When Elmslack pump was broken off level with the ground in November 1934 the Parish Council decided to store the parts for safe keeping since the well was little used.<sup>21</sup> When the pump at Burton Well was found to be broken in June 1937 it was resolved that the work "...be left over until some request is received for its repair."<sup>22</sup> And perhaps Bank Well was only used in periods of drought, because it was in the dry year of 1933 that complaints were made that it was overgrown and difficult to use for watering cattle.<sup>23</sup> Bank Well was not the only one that became overgrown. Storth Well had to be cleared of vegetation several times,<sup>24</sup> and the cover over Burton Well had to be repaired and leaves cleared from its surface.<sup>25</sup>

The references to less frequent use of the wells are consistent with the evidence that roofwater systems were well developed by the beginning of the twentieth century. It was when the rains failed that the roofwater storage tanks dried up and residents had recourse to the wells.<sup>26</sup> Some would buy water carted from Wood Well.<sup>27,28</sup> Public-spirited residents also helped. In September 1919 Mr Sharp was thanked for providing water for the village from the Bleasdale House supply.<sup>29</sup>

There are a few references in the Parish Council minutes to deliberate damage to the wells. Burton Well seems to have been particularly vulnerable, perhaps because of its remote location. In October 1928 it was found that a bar fastening one of the galvanised sheets had been forcibly removed "and the sheet cast into the water."<sup>30</sup> And in February 1933 it was reported that "some mischievous person had badly damaged the pump at Burton Well and put it out of action."<sup>31</sup>

Disputes over access to the wells and watering-places occupied a good deal of Parish Council time. The Enclosure Award was frequently quoted as authority of rights of access, but not always successfully. The dispute at Waterslack has already been mentioned, but other long-running disputes occurred over access to Haweswater and to Dogslack Well.

The Parish Council accidentally precipitated the Haweswater dispute in 1896 when, as part of its policy of encouraging holiday visitors, it signposted the track to Haweswater from the Milnthorpe road as a public footpath. This swiftly brought a letter from the Dallam Tower Estate office complaining that the track was not a public road or footpath but was merely an access to the watering-place.<sup>32</sup> The Parish Council refused to take down the sign.<sup>33</sup> This dispute re-surfaced in 1916 when Haweswater had passed into the ownership of the Challon Hall Estate. The footpath sign at the end of the track to the lake had been broken, and as this was the second time, the incident was reported to the police.<sup>34</sup>

The Parish Council lurched into a fresh confrontation in the 1920s when it was distributing seats around the village and decided to put one on the shore of Haweswater.<sup>35</sup> Challon Hall Estate threatened to throw the seat into the lake.<sup>36</sup> In January 1927 the Parish Council heard that the seat was now in the lake.<sup>37</sup> Efforts to involve the Rural District Council in sorting out this dispute proved fruitless. The lack of help from that quarter was recorded by the Parish Council with "keen dissatisfaction".<sup>38</sup>

The other serious access dispute first arose in May 1909 when Mrs Gerard of Thornhill complained that she was prevented from using the public footpath to Dogslack Well by Mrs Jackson of Bigland House.<sup>39</sup> The Parish Council again invoked the authority of the Enclosure Award

plan to show a right of way to the well. Again the argument put forward from the opposing side was that there was no public footpath, but only a right of access to the well for tenants who needed water.<sup>40</sup> Over the years the dispute spluttered into new life from time to time, and in October 1931 the County Council was asked to intervene.<sup>41</sup> Legal action was considered in July 1932 but the County Council asked for costs to be shared with the Rural District Council.<sup>42</sup> Following a meeting on site in 1933 it became clear that the County Council were not keen to proceed with legal action because the path was so little used.<sup>43</sup> The path remains closed in 1993.

It is evident from the frequent occasions when the wells were inaccessible or overgrown that they were not all used regularly. It appears that their main function for most residents in the early decades of the twentieth century was to provide an emergency source of water when roofwater tanks ran dry. Nevertheless, while there remained an obligation to maintain public water-supplies by means of wells, even if only occasionally used, local authorities throughout England's rural areas must have faced similar problems of maintenance and access.

### Notes

1. Lancashire Record Office (hereafter L.R.O.) AE/5/14a(Silverdale).
2. L.R.O. AE/5/146 (also at PR 2986/1) (Warton).
3. L.R.O. AE/5/146.
4. L.R.O. AE/5/14a.
5. L.R.O. AE/5/146.
6. L.R.O. AE/5/146.
7. L.R.O. PR 69.
8. L.R.O. PR 69 (Silverdale Ratepayers Minute Book, meeting of 23 March 1853).

9. L.R.O. PR 69.
10. L.R.O. PR 69. The stone trough is still in place in 1993, though very overgrown.
11. L.R.O. PR 69 (Silverdale Ratepayers Minute Book, meeting of 3 February 1893).
12. Information from Mr John Walker, Lake View, Silverdale.
13. L.R.O. SAL/1/1 (Lancaster Rural Sanitary Authority Minute Book for 1872-1875 meetings).
14. L.R.O. SAL/1/1 (Lancaster Rural Sanitary Authority Minute Book, meeting of 28 March 1891).
15. L.R.O. PR 69 (Silverdale Ratepayers Minute Book, meeting of 24 March 1891).
16. L.R.O. PR 69 (Silverdale Ratepayers Minute Book, meeting of 22 November 1892).
17. L.R.O. SAL 1/1 (Lancaster Rural Sanitary Authority Minute Book, meeting of 14 January 1893).
18. Further details of some wells are included in Appendix F.
19. L.R.O. PR 2985/2 (Silverdale Parish Council Minute Book - hereafter S.P.C.M.B. - 14 October 1929).
20. L.R.O. PR 2985/2 (S.P.C.M.B. 12 January 1914).
21. L.R.O. PR 5031/1/2 (S.P.C.M.B. November 1934).
22. L.R.O. PR 5031/1/2 (S.P.C.M.B. 7 June 1937).
23. L.R.O. PR 5031/1/2 (S.P.C.M.B. 10 July 1933).
24. See notes in Appendix F.
25. See notes in Appendix F.
26. For example, Mr Horton of Lindeth and Mrs Letcher (who lived in Shore Cottages, Silverdale) both recall trips to Woodwell for water when roofwater tanks ran dry.
27. L.R.O. PR 5029/1/2 (Warton with Lindeth Parish Council Minute Book, meeting of 12 March 1928).
28. L.R.O. PR 2986/2 (Warton with Lindeth Parish Council Minute Book, meeting of 9 June 1911, when the Council objected to the residents of Silverdale using Woodwell, which was in Lindeth. It was resolved that a notice be fixed near Woodwell stating that any person carting water who is not a resident in the Township will be prosecuted.)
29. L.R.O. PR 2985/2 (Silverdale Parish Council Minute Book - hereafter S.P.C.M. - 8 September 1919).
30. L.R.O. PR 2985/2 (S.P.C.M.B. 8 October 1928).

31. L.R.O. PR 5031/1/2 (S.P.C.M.B. 13 February 1933).
32. L.R.O. PR 2985/1 (S.P.C.M.B. 31 January 1896).
33. L.R.O. PR 2985/1 (S.P.C.M.B. 28 February 1896).
34. L.R.O. PR 2985/2 (S.P.C.M.B. 13 November 1916).
35. L.R.O. PR 2985/2 (S.P.C.M.B. 23 June 1926).
36. L.R.O. PR 2985/2 (S.P.C.M.B. 20 December 1926).
37. L.R.O. PR 2985/2 (S.P.C.M.B. 10 January 1927).
38. L.R.O. PR 2985/2 (S.P.C.M.B. 11 July 1927).
39. L.R.O. PR 2985/1 (S.P.C.M.B. 10 May 1909).
40. L.R.O. PR 2985/1 (S.P.C.M.B. 10 March 1913).
41. L.R.O. PR 5031/1/2 (S.P.C.M.B. 12 October 1931).
42. L.R.O. PR 5031/1/2 (S.P.C.M.B. 11 July 1932).
43. L.R.O. PR 5031/1/2 (S.P.C.M.B. 9 October 1933).

## 6. PIPED WATER FOR SILVERDALE: EARLY SCHEMES

Three schemes to bring piped water to Silverdale were discussed between 1902 and 1907. All three were rejected by local ratepayers, and after 1907 no further schemes were seriously considered until the 1930s.

The schemes were put forward by William Dodd, a well-to-do resident of Silverdale who had moved there from his native Kirkby Lonsdale sometime between 1872 and 1882. He was born in 1838 in Kirkby Lonsdale, married there and his two children May and Matthew were born there in 1868 and 1872. Sadly, both children died when young. May was only 14 when she died at Green Close, Silverdale, and Matthew only 19 when he died while crossing the Pacific Ocean. Mrs Dodd died a few years later, and William lived on at Green Close for a further 13 years until his death in 1910.<sup>1</sup>

William Dodd had always involved himself in public affairs. He worked at Kirkby Lonsdale County Court and became a member of that town's Local Board. After moving to Silverdale he represented that township on the Lancaster Board of Guardians, and he became a magistrate in 1894. Of more significance from the point of view of water-supply was his election as a member of the Lancaster Rural Sanitary Authority in 1882, representing Silverdale and Yealand Redmayne.<sup>2</sup> He later served on the Rural District Council, and he was chairman of Silverdale Parish Council from 1902 until his death in 1910. He therefore provided a very strong link between the Parish Council and the Rural Sanitary Authority and, later, the Rural District Council.

The minute books of the Rural Sanitary Authority show that William Dodd became a very active member of the Authority as soon as he arrived in 1882. The Authority had been set up in 1872, and one of its principal aims was to extend to rural areas the sanitary improvements that had led to higher health standards in the towns.<sup>3</sup> One of the first essentials, as was made clear by the Authority's Inspector of Nuisances and Medical Officer of Health, was an efficient sewerage system, especially in the larger settlements. Lancaster Rural Sanitary Authority covered a wide tract of rural Lancashire around Lancaster Borough. South of Lancaster the main settlements were Scotforth, Galgate, Glasson Dock, Cockerham and Thurnham. North of Lancaster the Authority was responsible for Hest Bank, Bolton-le-Sands, Carnforth, Warton and Silverdale (Fig.1). Attention in the early days was focused very closely on the larger and more urbanised of the settlements, such as Carnforth, Scotforth and Galgate. Soon after his appointment the Inspector of Nuisances drew up sewerage schemes for these places.<sup>4</sup>

A good water-supply was also essential, not only to provide households with drinkable water, but also to ensure that the sewers were flushed out regularly. Here there was a problem for the Authority. A good water-supply required a good catchment area, or perhaps several in view of the dispersed population in the Authority's area. But the Authority was late in joining the search for good catchments. Lancaster Borough had already claimed the best one in the area - the Upper Wyresdale valley (Fig.1). Lancaster had started to use this catchment as early as the 1850s, and its claim to exclusive use of the catchment was confirmed by Act of Parliament in 1864, when it was decided that Liverpool's rival request for rights there should be refused. Lancaster was allowed to take 700,000 gallons a day from

the catchment, which was for the use of the borough itself. A further Act of Parliament in 1876 allowed Lancaster to take more water from the same catchment, and the town now had a surplus which it wanted to sell to settlements in the Rural Sanitary Authority's area.<sup>5</sup>

In February 1876 the Rural Sanitary Authority recorded the view that Lancaster, in collecting more water than it needed for its own population, was depriving others of the opportunity of collecting water for their own people. It was noted that Lancaster was asking for powers to supply water to other townships in the locality, but without undertaking any obligation to do so.<sup>6</sup> It had to be admitted, however, that there was an overwhelming argument in favour of places such as Scotforth, which was virtually a suburb of Lancaster, being supplied by the borough. Scotforth was duly connected to the Lancaster supply while the Sanitary Authority complained that Scotforth residents were being charged 50% more for their water than Lancaster residents.<sup>7</sup> The Rural Sanitary Authority tried to negotiate a more favourable rate for Scotforth in February 1880.<sup>8</sup>

The Lancaster Rural Sanitary Authority therefore had a major problem with water-supply. It did not have any obvious catchment areas to exploit, but could have water from Lancaster if it was prepared to pay a high price. In the circumstances it decided to try to supply water to two settlements, Carnforth and Galgate, by means of water-schemes that used local catchments.<sup>9, 10</sup> Neither scheme was completely successful. The Medical Officer of Health reported in 1892 that Galgate had got its water-supply, from local springs, but that he would have been happier if a supply had been arranged from Lancaster Corporation or from Manchester's Thirlmere aqueduct, which passed through the eastern edge of the Authority's area.<sup>11</sup> The aqueduct, which was completed through to Manchester in 1893,<sup>12</sup>

provided a much-needed and potentially competitively-priced alternative source of water since, for reasons explained in Chapter 2, Manchester Corporation was obliged to provide water on request to townships on the route of the pipeline.

The Carnforth Waterworks was a private venture, based on a small reservoir at Peddar Potts, 3 km. east of the town.<sup>13</sup> The Carnforth company had hoped to be able to supply several townships in the immediate area, but in the event it was hard pressed to provide an adequate supply to Carnforth and Warton. The first water was supplied in 1879, but by the 1890s there were problems not only with water quantity, but also with its quality.<sup>14</sup> If the Carnforth scheme had been more successful, it is even possible that it could have supplied the Lindeth area of Silverdale. As it was, it seemed to stand between Silverdale and a possible supply from Lancaster Borough.

The Rural Sanitary Authority was now beginning to bow to the inevitable and negotiate water-supplies for the larger settlements close to Lancaster with the borough. Bolton-le-Sands was soon connected with a mains supply<sup>15</sup> and in 1894 mains were laid to Slyne with Hest.<sup>16</sup> Silverdale remained one of the largest townships in the Authority's area which did not have piped water. When the Authority's responsibilities were transferred to the newly-formed Lancaster Rural District Council Mr Jowett was retained as Inspector of Nuisances and Surveyor. In 1898 he was asked to estimate the cost of supplying Yealand with water from the Thirlmere aqueduct, and he noted that an extension of the pipeline to Silverdale could not be considered since adding Silverdale to such a scheme would only add to the cost and would not assist in diminishing the general expenses.<sup>17</sup> Even in Yealand the piped supply would involve a rate of five shillings in

the pound, which Yealand Parish Council decided "places it beyond the possibilities of being carried out."<sup>18</sup> Following Mr Jowett's death in 1898 his very onerous duties were divided between two successors. His successor as surveyor, Mr Dixon, estimated the capital cost of laying a pipe to the Yealands and Silverdale at £7554 in 1901.<sup>19</sup>

The Rural District Council's Medical Officer of Health, Dr Parker, was now taking an interest in Silverdale's water-supply and sanitary arrangements, which he decided may be linked in the most undesirable way. In his report for 1900 he noted that some of Silverdale's cesspools, built on fissured limestone, never required emptying. While this was convenient for the owners, it did raise the question of where the polluted water might get to once it entered the limestone joint-system. Not only was there a danger of pollution of the natural springs and wells in the village, but it was also possible that polluted water could seep into underground roofwater storage tanks if they were not properly sealed.<sup>20</sup>

The conscientious Dr Parker ruffled many feathers. His concern with Silverdale was only one of many matters that brought him into conflict with the Rural District Council. The crisis reached the stage where the Local Government Board felt that they must intervene, and they despatched Dr Mivart to report on the sanitary circumstances of the Lancaster Rural District Council area. His report appeared in 1902.<sup>21</sup> From this time on various villages that lacked a water-supply, including Silverdale, were constantly in the minds of the Local Government Board.

It was against this background that in 1902 their recently-elected chairman, William Dodd, put forward a scheme to the Parish Council for supplying Silverdale with water from Lancaster Waterworks by

tapping into the mains supply at Bolton-le-Sands and laying a pipe across the sands of Morecambe Bay.<sup>22</sup> The cost of the scheme was estimated initially as £3800, but when Mr Dodd presented the scheme in more detail to the Annual Parish Meeting in the following March the estimated cost had risen to £4500. The minutes of the Parish Meeting make it clear that the details of the scheme had been drawn up by Mr Dixon, at the request of Mr Dodd.<sup>23</sup> The cross-sands pipe would have been  $3\frac{3}{4}$  miles long, arriving at the southern edge of Silverdale at Brown's houses. Water was to be supplied by Lancaster at 8 pence per thousand gallons, but the main problem was, of course, the capital cost of the scheme. To pay for a loan would cost £350 per annum, but water rents would only bring in £200 per annum. The balance would have to go onto the Silverdale and Lindeth rates, adding about 6 pence in the pound.

Opposition to the scheme was led by Mr Edmondson with a motion that "... the time has not yet arrived when the township shall have a public water supply." An amendment proposed by Mr Deason suggesting that the matter should be considered in more detail was rejected by 23 votes to 9. It is a little ironic to reflect that had this scheme come to fruition the first houses to benefit would have been Brown's Houses, which are still without a public water-supply in 1993. (See Photo 12.)

William Dodd did not give up, and though there is no official record, he is reported to have tried to obtain water for Silverdale by joining South Westmorland's Lupton Scheme in the early years of the new century.<sup>24</sup> At that time the engineer to the scheme considered the inclusion of Silverdale to be impossible. Mr Dodd raised the question of water-supply again in the Parish Council meeting in May 1906,<sup>25</sup> and in May 1907 the Council discussed the possibility of using Haweswater Lake, in the north of the township, as a source of water for the village. A similar scheme was said to be in hand at Chorley, and

Mr Dodd proposed to visit this.<sup>26</sup>

Dr Parker, the Medical Officer of Health, continued to press for a water-supply for Silverdale. One of his general concerns was to try to slow down the rate of migration of the rural population into the towns, where conditions were unhealthy. He believed that rural depopulation could only be slowed down or halted by improving conditions in rural areas, and a top priority was the provision of piped water inside the home. In his Annual Report for 1901 he notes a fall (albeit a small one) in the population of Silverdale between 1891 and 1901 (Fig.3), attributing this to lack of piped water.<sup>27</sup>

Dr Parker was convinced that Silverdale had great potential as a health resort, and believed that provision of piped water would cause "this pretty village to boom as a holiday centre."<sup>28,29</sup>

In May 1907 the South Westmorland Rural District Council gave the go-ahead to its Lupton Scheme (Fig.1), which was to supply piped water to Milnthorpe, Beetham, Haverbrack, Holme, Heversham and Arnside.<sup>30</sup> Work on the pipeline started at the end of 1907, and it was at this late stage that an informal contact between William Dodd and a councillor of the South Westmorland Rural District Council encouraged him to make an official approach to ask whether Silverdale could join the scheme.<sup>31</sup> The Clerk to the Rural District Council wrote letters in November 1907 suggesting that the Council may be sympathetic to Silverdale joining, and could Mr Dodd find out as quickly as possible whether an official application was to be made.<sup>32</sup> It was already too late to include Silverdale in the immediate plans, but at least a wider-diameter pipe could be laid to Arnside in preparation.

On 11th November 1907 Mr Dodd reported the correspondence to the Parish Council, and it was decided to test the feeling of the village at a special meeting of ratepayers.<sup>33</sup> At this crucial meeting, held



Photo 12. A roofwater supply system still in use at Brown's Houses, Silverdale in 1993. Water from the front half of the roof (on the right of the photograph) is brought across the gable end to join water from the back half of the roof. This is carried across to a tank in the back garden. Additional rainwater is collected from the metal covering on the tank.

at the National School on 10th December, Mr Dodd outlined the proposal and put the total capital cost at £2720. Water would be supplied at 7 pence per thousand gallons to a maximum daily amount of 30,000 gallons. Mr Dodd made clear the view of the Medical Officer of Health that piped water was needed for the health of the residents. Others suggested that piped water would encourage more visitors to come to the village, but the concept of Silverdale as a holiday resort was greeted with derisive laughter from some parts of the meeting. The arguments against the scheme centred very much on the cost, and the case for piped water was not helped when no accurate estimate could be given of the likely addition to the rates. Opposition to the scheme was led by Mr J.H.Edmondson who said that it would be "ruinous to the best interests of the township", and he was joined by Major Saunders of The Cove. When this lively meeting ended and a vote was taken only "about half a dozen" of the 70 or 80 ratepayers present put up their hands in favour of the scheme.<sup>34,35</sup> Most of those voting had probably already gone to the expense of providing their own homes with adequate water-supplies by installing roofwater systems.

The decisive rejection of the proposal to join the Lupton scheme showed the determination of Silverdale's ratepayers not to be saddled with the capital cost of a piped water-supply. During 1908 Mr Dodd tried to negotiate a lower water charge with South Westmorland Rural District Council, but this was based on the unrealistic assumption that the daily consumption per head in Silverdale could be reduced to 10 gallons (45 litres).<sup>36</sup> The help of a Nottingham civil engineer, Mr Pickles, was enlisted to see whether a cheaper scheme could be set up, and the possibility of using the township's Haweswater Lake was again considered.<sup>37</sup>

The Local Government Board was still showing concern about the provision of a water-supply and sewerage scheme for Silverdale.<sup>38</sup>

In November 1909 the Clerk to Lancaster Rural District Council noted that the Local Government Board "keep writing to us about Silverdale's water supply" but nothing further has been done. "How long it will be allowed to go on I cannot say, but really Trade & c. is so bad in the whole County it is a pity the l.Govt.Bd. keep bothering us."<sup>39</sup>

Another letter from the Clerk written in 1912 comments that while carrying out its duties the Council must be mindful of burdens on the ratepayers.<sup>40</sup>

But by this time William Dodd had been dead for nearly two years, and his arch-opponent over the water schemes, Mr Edmondson, had emigrated to New Zealand.

#### Notes

1. Obituary in Lancaster Guardian, February 1910.
2. Lancashire Record Office (hereafter L.R.O.) SAL/1/2 (Lancaster Rural Sanitary Authority - R.S.A. - Minute Book 29 April 1882)
3. L.R.O. SAL 1/1 (Lancaster R.S.A. Minute Book for the years 1872 to 1875).
4. L.R.O. SAL 1/1 (Lancaster R.S.A. Minute Book 19 July 1873).
5. R.H.Conway. An outline History of Lancaster Water Supply ... Hull University Thesis, April 1970. Lancaster Public Library Reference Department PT 8597.
6. L.R.O. SAL 1/1 (Lancaster R.S.A. Minute Book 26 February 1876).
7. L.R.O. SAL 1/1 (Lancaster R.S.A. Minute Book 26 February 1876).
8. L.R.O. SAL 1/2 (Lancaster R.S.A. Minute Book 21 February 1880).
9. L.R.O. SAL 1/1 (Lancaster R.S.A. Minute Book 27 January 1877).
10. L.R.O. SAL 1/5 (Lancaster R.S.A. Minute Book 31 January 1892), and L.R.O. RDLA 2/1 (Lancaster R.S.A. Letter Book, p.446).
11. Lancaster R.S.A. Medical Officer of Health Report for 1891. Seen at Morecambe Town Hall.

12. Elizabeth Porter. Water Management in England and Wales, Cambridge University Press (1978), p.39.
13. L.R.O. SAL 1/1 (Lancaster R.S.A. Minute Book 12 February 1876).
14. L.R.O. SAL 1/5 (Lancaster R.S.A. Minute Book 1 July 1893).
15. L.R.O. RDLA 2/1 (Lancaster R.S.A. Letter Book, p.195).
16. Lancaster R.S.A. Medical Officer of Health Report for 1894. Seen at Morecambe Town Hall.
17. L.R.O. RDLA 13/1 (Lancaster Rural District Council Surveyor's Memoranda Book, July 1898).
18. Lancaster Rural District Council Minute Book, meeting on 13 August 1898. Seen at Lancaster Town Hall.
19. Lancaster Rural District Council Minute Book, meeting on 10 August 1901. Seen at Lancaster Town Hall.
20. Lancaster Rural District Council (hereafter R.D.C.) Medical Officer of Health Report for 1900. Seen at Morecambe Town Hall.
21. F.St.G.Mivart. Report to the Local Government Board on the General Sanitary Circumstances and Administration of the Lancaster Rural District. H.M.S.O. (1902).
22. L.R.O. PR 2985/1 (Silverdale Parish Council Minute Book - S.P.C.M.B. - 10 November 1902).
23. L.R.O. PR 5031/1/1 (Silverdale Annual Parish Meeting Minute Book, p.20, 17 March 1903).
24. L.R.O. PR 5031/1/1 (Silverdale Annual Parish Meeting Minute Book, p.28, 10 December 1907).
25. L.R.O. PR 2985/1 (S.P.C.M.B. 14 May 1906).
26. L.R.O. PR 2985/1 (S.P.C.M.B. 13 May 1907).
27. Lancaster R.D.C. Medical Officer of Health Report for 1900. Seen at Morecambe Town Hall.
28. Lancaster R.D.C. Medical Officer of Health Report for 1905. Seen at Morecambe Town Hall.
29. In his report for 1911 the Medical Officer of Health to Lancaster R.D.C. (W.Edmondson) comments that the lack of a piped water-supply in Silverdale had led to a decision not to build an estate of houses in the village.
30. Cumbria Record Office, Kendal WSRD/SW (South Westmorland Rural District Council Minute Book, 14 May 1906).
31. Cumbria Record Office, Kendal WSRD/SW (South Westmorland R.D.C. Clerk's Letter Book, p.366. Letter of 4 November 1907).
32. Cumbria Record Office, Kendal WSRD/SW (South Westmorland R.D.C. Clerk's Letter Book, pp.381 and 402. Letters dated 9 November 1907 and 20 November 1907).

33. L.R.O. PR 2985/1 (Silverdale P.C.M.B. 11 November 1907).
34. L.R.O. PR 5031/1/1 (Silverdale Annual Parish Meeting Minute Book, p.28, meeting of 10 December 1907).
35. Report in the Lancaster Guardian, December 1907.
36. L.R.O. RDLa 2/4 (Lancaster R.D.C. Letter Book 1907-11, p.73, letter dated 2 March 1908).
37. L.R.O. RDLa 2/4 (Lancaster R.D.C. Letter Book 1907-11, p.193, letter dated 2 January 1909).
38. L.R.O. RDLa 2/4 (Lancaster R.D.C. Letter Book 1907-11, p.190, letter dated 23 December 1908).
39. L.R.O. RDLa 2/4 (Lancaster R.D.C. Letter Book 1907-11, p.303, letter dated 29 November 1909).
40. L.R.O. RDLa 2/5 (Lancaster R.D.C. Letter Book 1911-17, p.49, letter dated 29 January 1912).

## 7. PIPED WATER FOR SILVERDALE: THE SUCCESSFUL SCHEME

The Silverdale Ratepayers meeting of November 1907 made the position starkly clear: Silverdale residents were not prepared to meet the full cost of bringing piped water to the village. Lancaster Rural District Council took the side of the Silverdale residents and told the Local Government Board that "Silverdale as regards Assessment Value is a very poor Township."<sup>1</sup> In 1908 the borrowing powers were no more than £6962.<sup>2</sup> No doubt similar messages were coming into the Local Government Board from most of the sparsely inhabited areas of England.

In Silverdale some pressure was exerted by visitors. Anyone used to the convenience of town supplies of water would be surprised by the lack of facilities in Silverdale. Some would see this as part of the relaxed charm of the village, but others decidedly did not. In 1913 Mr Hartshorn, a summer visitor to Knowe Lodge, "Lindeth, by the Sea, Silverdale", wrote directly to the Local Government Board to complain about the lack of piped water.<sup>3</sup> His irritation stemmed from an incident when he was evidently left without water, and he enclosed a letter from a Mr Robinson apologising for the fact that "...we have been unable to get you any Water today. I asked three people if they would do the job for me, and explained your circumstances, but could not get them to do it ... I ... will have a load there first thing in the morning, all being well, not any later than eight o'clock." Copies of both these letters were forwarded to the Lancaster Rural District Council for their consideration. They responded by pointing out to the Local Government Board that the cost of a water-supply scheme would be prohibitive.<sup>3</sup>

As there was no immediate prospect of piped water coming to Silverdale the best was made of the existing arrangements in the early decades of the twentieth century. In particular the Rural District Council's Sanitary Inspector insisted that no new house could be occupied until he had agreed that its water-supply was adequate and drinkable, and he had issued a Water Certificate. The regulations (for details see Appendix A) required that roofwater should be filtered before being collected in a covered tank or cistern, usually built from stone with a cement render, and often underground.<sup>4</sup> The specified minimum tank capacity depended on whether the house had a bath and water closet. Two cottages in The Row were given Water Certificates in 1920 and had tanks of 1400 gallons capacity,<sup>5</sup> but in 1926 four cottages built by Mr Bright were refused certificates because their tanks were only of 600-700 gallon capacity, and the cottages had baths.<sup>6</sup> Most new houses had tanks that would hold about 3000 gallons, but a large house would have very much larger tanks. Greywalls, built for the Sharp family in 1926 in the south of the village, had tanks with a capacity of over 38,000 gallons, for combined roofwater and borehole-water storage.<sup>7</sup>

The severe drought of 1921 put the water-supply system of Silverdale, and of many other similar villages, under severe stress. Some houses were without any water, and others had almost empty tanks.<sup>8</sup> The wells and water-carts provided emergency supplies in the village, but in the drought of 1933-34 some took advantage of the piped water that had reached Arnside. Mr Jackson, a haulage contractor, obtained 800 gallons of water from an Arnside garage, for his own purposes. But the South Westmorland Rural District Council pointed out to him that this was an offence, and any repetition would lead to prosecution.<sup>9</sup>

In 1930 the Arnside water-supply system was extended to Far Arnside, only 1 km. from Silverdale's northern boundary. South Westmorland offered to extend the supply into Silverdale, but the Parish Council decided that the cost (£15,000) was far too high.<sup>10</sup>

By the late 1920s it was becoming clear to central government that there would be no real progress in bringing piped water to the smaller villages throughout England and Wales unless some subsidy was applied. The Local Government Act of 1929 allowed Rural District Councils to raise money throughout their district to bring the benefit of water-supply to single townships. Lancaster Rural District Council now saw an opportunity to provide Thurnham and Cockerham with a long-overdue piped water-supply. A scheme was drawn up in 1933 which required those two townships to pay an increased levy of one shilling in the pound on their rates. The other townships in the rural district had to pay a levy of 3 pence in the pound, so that the Silverdale ratepayer now found himself paying more in rates, but still had no piped water-supply himself.<sup>11</sup>

The longstanding anomaly of the administration of Lindeth, contiguous with Silverdale, but administered by Warton Township, was finally dealt with in the local government boundary changes of the early 1930s. Despite the protests of the residents, Lindeth was transferred to Silverdale Township at the end of 1934,<sup>12</sup> and with it Woodwell, one of the most reliable wells in the area. Many had depended on water from Woodwell during droughts, and Lindeth residents had complained about water being carted from Woodwell to supply Silverdale. When this happened in the dry period of 1911 the Warton Parish Council resolved to threaten prosecution of anyone taking water from the well who was not a resident of the township of Warton with Lindeth.<sup>13</sup>

Silverdale Parish Council immediately started a programme of renovation on the well, and in July 1935 a tender of £45 was accepted for work on improving the water-collecting tanks under the issues.<sup>14</sup> Many residents felt that expenditure of this magnitude on what could be regarded as a virtually redundant water-supply system was not acceptable. At the Parish Council meeting on 8th July 1935 the Clerk read out a letter from the Silverdale Advancement Association<sup>15</sup> requesting that "the Parish Council, before accepting any tender for the proposed Woodwell water scheme, urge that the service of a competent Civil Engineer be engaged at a cost not exceeding £50 to make a complete survey and estimate of the cost of a water and drainage scheme for the whole of Silverdale." After discussion the Council resolved that "the present is not an opportune time to put the Parish to such expense, and that the request be not entertained."<sup>16</sup>

This is the first evidence of an organised pressure group trying to persuade the Parish Council to consider bringing piped water to the village. For the moment the Council was able to resist the pressure. Work continued at Woodwell through the summer of 1935, under the supervision of a Woodwell Committee of the Parish Council.

The severe drought of 1933-34 made very clear the inadequacy of rural water-supplies nationwide, and led to the decision to allow central government to subsidise the capital cost of providing piped water in rural areas (see Chapter 2). This change in the financial climate led to rapid developments nationwide and locally. The extent of the problem was first assessed by means of surveys carried out by each county.<sup>17</sup> Parish councils were becoming aware of the opportunities for obtaining subsidised piped water, and in June 1934 Priest Hutton Parish Council requested a piped supply so long as it did not add

more than two shillings in the pound to the rates.<sup>18</sup> By February 1935 agreement had been reached between Lancaster Rural District Council and Lunesdale Rural District Council to provide a piped supply for Priest Hutton and Borwick from the Thirlmere aqueduct. Conditions of supply were agreed with Manchester Corporation in January 1936.<sup>19</sup>

This was clearly the time for those interested in getting piped water to Silverdale to act, since a pipeline to Borwick was effectively the start of a pipeline to the Yealands and Silverdale. Pressing for action were the Medical Officer of Health, the Ministry of Health (evolved from the Local Government Board), and those many villagers who regarded their existing water-supply arrangements as outdated. Among these were many who wanted to see the further development of Silverdale as a resort. The opposition to piped water had always been based firmly on the very high capital cost of the schemes. Now that a subsidy could be obtained this argument was greatly weakened, and the way was clear for work to start on the long-overdue modernisation of the village's water-supply.

In April 1936 the engineer who had designed the scheme for Borwick and Priest Hutton (Mr H.B.Ward of Liverpool) was asked by Lancaster Rural District Council to prepare a scheme for supplying Yealand Conyers, Yealand Redmayne and Silverdale. It was important to make a decision about this larger scheme before a pipe was laid to Priest Hutton, as the same pipe could be used for the first part of the route, but the question of pipe diameter had to be settled.<sup>20</sup> In April 1936 Mr Ward's report was considered and it was resolved to go ahead with the project.<sup>21</sup> In June 1936 a Ministry of Health grant of £750 towards the capital cost was agreed to, after an unsuccessful attempt to get more by sending a delegation to London.<sup>22</sup>

A loan of £27,400 from the Public Works Loan Board was approved by the Rural District Council in May 1937,<sup>23</sup> and work started on the Priest Hutton section in the summer of that year. An important factor in making the scheme financially viable was the money granted by the County Council and the Rural District Council towards payment of interest charges on the loan. Of the £1460 annual interest charges the county agreed to pay about 35%, and the Rural District Council levied a rate of 2½ pence over the whole district to bring in another 35%. This left 30% (£432 per annum) to be raised in the parishes which were to benefit from the piped supplies, amounting to an additional rate of one shilling in the pound.<sup>24</sup>

Work now proceeded quickly. Gordon Bridges was appointed Clerk of Works in July 1937, and in October he was allowed four shillings a week towards the cost of running his motor-cycle.<sup>25</sup> Of the nine tenders received for the work the lowest (that of Messrs Peter Drummond & Son, Dumfries) was accepted. Though there is no evidence in the minutes, it is widely believed in Silverdale that Drummonds lost heavily on the contract because of the high cost of making pipe-trenches in the areas where limestone is close to the surface. Nor was the supervision proceeding smoothly. In August 1938 the Rural District Council resolved that the Engineer, Mr Ward, be asked to dispense with the services of Mr Bridges "...at the earliest possible moment." An application from Mr Bridges for extra travelling expenses for his motor-cycle was not to be considered, and he was to be allowed a fortnight's holiday with pay.<sup>26</sup>

Despite these setbacks, piped water arrived in Silverdale during 1938, and in April of that year the Parish Council resolved to provide a treat for the workers when the project was complete.<sup>27</sup> Several of the workers had found lodgings in Silverdale, and some

married local girls.<sup>28</sup> The process of adapting from roofwater to mains water began. The steeply-rising curve of consumption in the first years after the arrival of the water is evidence of the installation of water closets, bathrooms and other facilities that are now taken for granted (Fig.5).<sup>29</sup>

### Notes

1. Lancashire Record Office (hereafter L.R.O.) RDLa 2/5 (Lancaster Rural District Council - R.D.C. - Letter Book 1911-17, p.49, letter of 29 January 1912).
2. L.R.O. RDLa 2/4 (Lancaster R.D.C. Letter Book 1907-11, letter of 23 December 1908).
3. Lancaster R.D.C. Minute Book, meeting of 23 August 1913. Seen at Lancaster Town Hall.
4. L.R.O. RDLa 1/2 (Lancaster R.D.C. Plans and General Purposes Committee, Minute Book 1922-1928, minutes of meeting on 22 May 1926).
5. L.R.O. RDLa 12/12 (Lancaster R.D.C. Sanitary Inspector's Report Book 1920-1936, p.9).
6. L.R.O. RDLa 12/12 (Lancaster R.D.C. Sanitary Inspector's Report Book 1920-1936, p.157).
7. L.R.O. RDLa 12/12 (Lancaster R.D.C. Sanitary Inspector's Report Book 1920-1936, p.167).
8. L.R.O. RDLa 12/12 (Lancaster R.D.C. Sanitary Inspector's Report Book 1920-1936, p.21).
9. Cumbria Record Office, Kendal WSRD/SW (South Westmorland R.D.C. Minute Book for 1933-1934, p.100).
10. L.R.O. PR 2985/2 (Silverdale Parish Council Minute Book - S.P.C.M.B. - meeting of 10 February 1930).
11. L.R.O. PR 5031/1/1 (Silverdale Annual Parish Meeting Minute Book, meeting of 20 March 1933).
12. L.R.O. PR 5029/1/2 (Warton with Lindeth Parish Council Minute Book, meeting of 20 December 1934).
13. L.R.O. PR 2986/2 (Warton with Lindeth Parish Council Minute Book, meeting of 9 June 1911).
14. L.R.O. PR 5031/1/2 (S.P.C.M.B. minutes of meeting on 8 July 1935).

15. L.R.O. PR 5031/1/2 (S.P.C.M.B. minutes of meeting on 8 July 1935). The Silverdale Advancement Association was evidently an organisation that was mainly concerned with promoting Silverdale as a holiday village. At the Silverdale Parish Meeting of 1932 it was suggested that the Association was doing sufficient to advertise the village, and there would be no need for Silverdale to join the Federation of Morecambe Bay and Lakeland Resorts.
16. L.R.O. PR 5031/1/2 (S.P.C.M.B. minutes of meeting on 8 July 1935).
17. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 3 March 1934. Seen at Lancaster Town Hall.
18. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 30 June 1934. Seen at Lancaster Town Hall.
19. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 18 January 1936.
20. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 11 April 1936.
21. Lancaster R.D.C. Minute Book, minutes of meeting on 18 April 1936.
22. Lancaster R.D.C. Minute Book, minutes of meeting on 27 June 1936.
23. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 22 May 1937.
24. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 21 August 1937.
25. Lancaster R.D.C. Plans and General Purposes Committee minutes of meeting on 23 October 1937.
26. Lancaster R.D.C. Minute Book, minutes of meeting on 27 August 1938.
27. L.R.O. PR 5031/1/2 (Silverdale P.C.M.B. minutes of meeting on 11 April 1938).
28. Information from Mrs E.Letcher of Gaskell Close, Silverdale.
29. Lancaster R.D.C. Meter Readings for Ellel and Silverdale. Lancaster Public Library Reference Department MS 8368. This notebook is a handwritten record of weekly meter readings taken at the point where water was supplied from the Thirlmere aqueduct. The readings for the Silverdale pipeline are in the back of the book.

## 8. CONCLUSIONS

The great appeal of Chadwick's sanitary reforms to the Victorians was that not only could people's health be improved, but at the same time the installation of sewers and a piped water-supply could result in a net saving of expenditure on waste removal. Chadwick had the broad balance-sheet in mind, of course, taking account of reductions in illness leading to longer working lives and more likelihood of families being kept intact. But even when considered in the narrow terms of savings in waste removal it made economic sense to install sewers and a water-supply.

Unfortunately as the sanitary reforms were extended to smaller and smaller towns there came a point at which the installations were no longer cost-effective in these narrow terms. The costs of ill-health were not quantified, and the pleas of many conscientious Medical Officers of Health for piped water to be installed remained unheeded. It has to be admitted that the capital cost of mains water was very high and would have added a disproportionate amount to the rates in the smaller or more remote communities.

Nevertheless, some small communities could find a reasonably-priced water-supply because there was a convenient local catchment area. Silverdale, on limestone, had no natural catchment conveniently placed. Carnforth, though a small town, could afford to develop the small catchment at Peddar Potts, but this source provided barely enough water for Carnforth and Warton, so that there was no question of extending the pipework to Lindeth and Silverdale.

Another factor that worked against Silverdale was the separation of Arnside from Silverdale by the county boundary. Had Silverdale been with Arnside in the area administered by Westmorland Rural District

Council it must surely have been included in the Lupton water-supply scheme in 1907. Evidence of this is shown by the willingness of that council to consider supplying Silverdale by extending the pipe from Arnside. But though the capital cost of extending the pipeline would have been shared between the populations of Milnthorpe, Holme, Arnside and other settlements as well as Silverdale if the administrative boundary had been further south, in the event Silverdale was asked to bear the whole cost of the extension. This proved to be an unacceptably high price.

The map (Fig.1) shows how logical it would have been to include Silverdale in the Lupton scheme. A slightly wider-diameter pipe could have been laid to Arnside, and a 3 km. extension added, instead of which a second, parallel pipe was laid for 10 km. from the Thirlmere aqueduct to Silverdale.

Because there seemed to be no likelihood of a piped supply arriving in Silverdale the residents invested heavily in their roofwater systems, or built expensive tanks to store spring-water, as at Woodlands. This only hardened the resolve of many of the residents not to incur further expenditure on increased rates for a piped supply. As the Medical Officer of Health commented in his report for 1909: "Very few persons question the necessity of a good public water-supply to Silverdale when these schemes are ventilated. The rock which proves fatal to most of them is the provision of money. As soon as it is shown that an increase in the rates will result if the scheme is carried out, enemies arise on every side, and destroy it."<sup>1</sup>

Even though the roofwater collection systems were reasonably efficient, it is certain that they could not have kept pace with

the growing demands of the second half of the twentieth century.

The history of water-supply in Silverdale is summarised in Fig.5, which portrays elements of supply and demand at various periods. Details of the construction of this graph are given in Appendix E. Much of the information is only an approximation, but the drawing does demonstrate the three phases in the history of Silverdale's water-supply that can be recognised between 1800 and 1960.

Before 1850 the demand for water would be very low<sup>2</sup> and could probably be met by the supply from wells, even in the central area of the village. In the second phase the increasing demand was met by the installation of roofwater systems. The potential supply of roofwater is shown by the green line, but what we do not know is how far this supply fell short of the potential demand. It seems likely that it was adequate for several decades, but by the 1920s and 1930s it was proving insufficient. Some idea of the shortfall at the end of the 1930s can be gained by comparing the roofwater-supply line with the figures for consumption of water in long-established mains-water systems nationwide (shown by the red line).<sup>2</sup> Roofwater systems were perhaps only supplying about half the potential demand. Apart from higher domestic demands, there were also demands from dairy farms to meet new hygiene regulations.

The third phase of Silverdale's water-supply history covers the period 1938 to 1960, when the village was adjusting to the piped water-supply. The blue line on the graph shows the very rapid increase in consumption, due to increasing population and increasing individual demands. The rate of increase from 1940 to 1960 averages about 5% per annum, compared with the national average increase of about 2-3% per annum (red line). The two

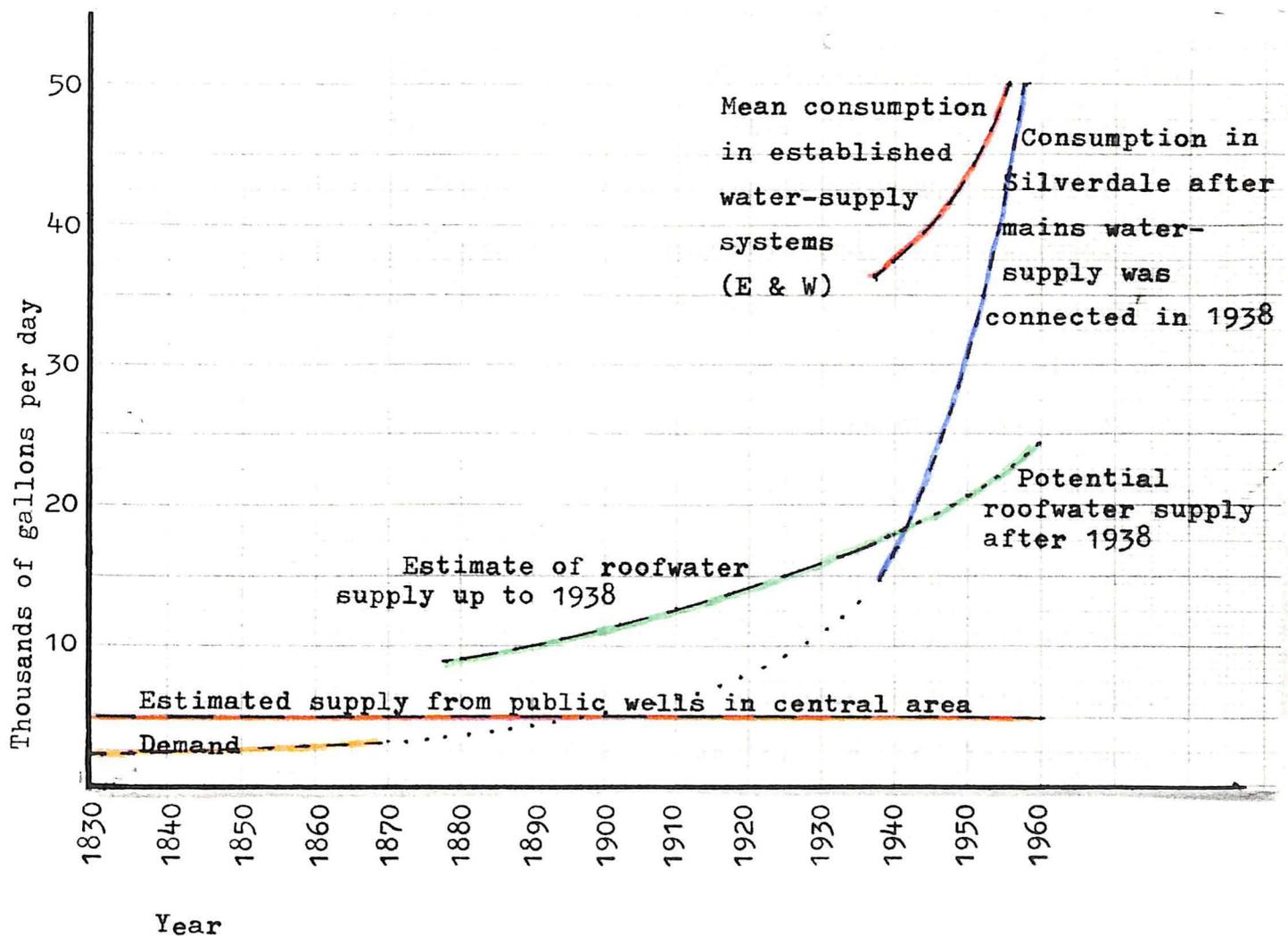


Fig.5. Graph showing supply and demand for water in Silverdale from 1830 to 1960.

For further details see p.70 of Conclusions, and Appendix E (p.84).

curves converge by about 1960, when Silverdale's inhabitants had had time to adjust to the availability of abundant supplies of clean water.

Ideally this dissertation should have compared the water-supply history of several rural areas, but lack of time has precluded this. Silverdale may be considered unusual because it is in a limestone area, and because it has attracted holiday visitors, but other villages have their own special characteristics, such as rural industries and development of commuter housing. The impression given by correspondence in *The Times* during the drought crisis of 1933-34 is that very many rural areas of England and Wales were dependent on roofwater supplies, supplemented by wells and streams. There can certainly be no doubt that rural areas lagged far behind urban areas in water-supply development. Rural administrative authorities were not able to raise the necessary capital, and yet they were the ones that needed most capital, to install pipework to scattered communities. They were late in claiming good catchment areas. And perhaps some of their most influential local leaders and decision-makers were the least likely to suffer from lack of piped water, since they could afford to have good roofwater arrangements, and perhaps a borehole supply.

Finally, it is interesting to speculate on what Silverdale would be like in 1993 if William Dodd had succeeded with his valiant efforts to bring piped water to the village in 1907. Only one record has come to light of a builder deciding against development in Silverdale because of the lack of a piped water-supply.<sup>3</sup> But no doubt some development was inhibited in the first half of this century, when builders could find land with access to piped water in Arnside, and along the coast in Hest Bank. By the time Silverdale had a piped

supply the planning controls on housing development were stricter. The need for roofwater supplies in some areas may also have influenced builders to put up bungalows rather than houses, to give larger roofs for more efficient water-collection.

It seems very likely that had William Dodd succeeded in 1907 we would have seen a considerably larger Silverdale today, perhaps rivalling Arnside in size. Whether William Dodd would have approved of this we cannot tell.

#### Notes

1. Lancaster Rural District Council Medical Officer of Health Report for 1909, p.21. Seen at Morecambe Town Hall.
2. W.G.V.Balchin. 'A Water Use Survey', Geographical Journal, 124 (1958).
3. Lancaster Rural District Council Medical Officer of Health Report for 1911. Seen at Morecambe Town Hall.

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- Silverdale Parish Council Minute Book 1913-1931 L.R.O.PR 2985/2
- Silverdale Parish Council Minute Book 1931-1938 L.R.O.PR5031/1/2
- Silverdale Parish Council Minute Book 1938-1946 L.R.O.PR5031/1/3
- Silverdale Annual Parish Meeting Minute Book 1894-1970 L.R.O. PR 5031/1/1
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- Warton with Lindeth Parish Council Minute Book 1919- L.R.O. PR 5029/1/2
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- Lancaster R.S.A. Minute Book 1882-1886 L.R.O. SAL/1/3
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- Lancaster R.S.A. Minute Book 1890-1893 L.R.O. SAL/1/5
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APPENDIX A. LANCASTER RURAL DISTRICT COUNCIL REGULATIONS  
CONCERNING COLLECTION OF ROOFWATER FOR DOMESTIC USE

Minutes of a meeting of the Plans and General Purposes Committee of  
the Lancaster Rural District Council 22nd May 1926:-

The following rules to be observed by persons submitting plans for  
house or houses where water supply is solely water collected from  
the roof were submitted:-

House not fitted with W.C. or bath	Minimum storage capacity (240 cu.ft) 1500 gallons
House fitted with bath but not W.C.	Minimum storage capacity (320 cu.ft) 2000 gallons
House fitted with W.C. but not bath	Minimum storage capacity (368 cu.ft) 2300 gallons
House fitted with bath and W.C. or W.Cs	Minimum storage capacity (480 cu.ft) 3000 gallons

All main storage tanks to be outside the house, to be constructed of  
either stone, concrete, or bricks, or other equally suitable material  
to be ventilated, this opening properly protected against admissions  
of contaminating matter, all overflow to be above ground, and not to  
communicate directly with any drain, to have an impervious covering  
of concrete, flags or other equally suitable material and to be  
provided with access opening of adequate size; this opening to be  
covered with a C.I. [cast iron] frame and cover or suitable flag.

Only water collected from roofs consisting of slates, tiles, concrete,  
or other equally suitable non-absorbent material, to be used for  
domestic purposes.

All water previous to entering storage tank to pass through a layer  
or layers of thoroughly clean, hard, suitable filtering material, of  
depth not less than 2-6 inches, the area of filter chamber (inside  
dimensions) to be not less than 3 ft x 3 ft and properly constructed  
for downward and upward filtration action.

Filter chambers to be properly constructed of either brick, stone, concrete, and cement rendered and covered with a suitable C.I. frame and cover, or suitable flag or flags.

APPENDIX B. ESTIMATES OF ROOFWATER SUPPLY FROM INDIVIDUAL ROOFS AND FROM ROOFWATER COLLECTION FOR THE WHOLE OF SILVERDALE

Roofwater supply from four typical roofs (roof areas measured from 1:2500 scale Ordnance Survey plans)

	<u>Example</u>	<u>Roof area</u>
A Cottage roof	Shore Cottage	6 x 6 m = 36 sq.m.
B House roof	Semi-detached house in Lindeth Road	9 x 9 m = 81 sq.m.
C Bungalow roof	Burnsall, Gaskell Close	13 x 11 m = 143 sq.m.
D Farm and farmbuildings	Waterslack: Farmhouse 133 sq.m. Farmbuildings 216 sq.m.	Total area = 249 sq.m.

Annual rainfall is 114 cm (Water Resources Board, Morecambe Bay Barrage, Desk Study). This should be rounded down to 100 cm to allow for evaporation and other losses during collection.

The total volume yielded per annum is therefore:

- A 36 cu.m. = 36,000 litres (about 8,000 gallons)
- B 81 cu.m. = 81,000 litres (about 17,000 gallons)
- C 143 cu.m. = 143,000 litres (about 30,000 gallons)
- D 350 cu.m. = 350,000 litres (about 77,000 gallons)

For a family of four this would give the following quantities:

<u>Roof</u>	<u>Yield per head per year</u>	<u>Yield per head per day</u>
A	9,000 litres (2000 gallons)	24 litres (5.5 gallons)
B	19,000 litres (4250 gallons)	52 litres (11.5 gallons)
C	35,250 litres (7500 gallons)	95 litres (21 gallons)

The rainfall required to fill a 13,600 litres tank (3000 gallons) would be 13.6 divided by the roof area x 100 cm = 4.4 cm (1.7 in.).

Estimate of yield from roofwater systems in the whole of Silverdale (including Lindeth) at various dates

The estimates include theoretical yields for roofwater systems in 1951 and 1961, when roofwater had been supplanted by a piped water-supply.

Date	Est. numbers of		Volume of roofwater from		Total yield		
	Houses	Farms	Houses (1)	Farms (1)	Per annum (1)	Per day (1)	(gal.)
1881	104	20	8,424,000	7,000,000	15,424,000	42,250	(9390)
1891	141	20	11,340,000	7,000,000	18,340,000	50,246	(11165)
1901	150	20	12,150,000	7,000,000	19,150,000	52,465	(11650)
1911	180	20	14,580,000	7,000,000	21,580,000	59,123	(13138)
1931	224	20	18,144,000	7,000,000	25,244,000	68,887	(15308)
1951	360	20	29,160,000	7,000,000	36,160,000	99,068	(22015)
1961	426	20	34,506,000	7,000,000	41,506,000	113,715	(25,270)

Notes

Column 2. The number of houses estimated from census data for Silverdale adjusted downward to deduct the number of residences that were farms, and adjusted upward to include houses in Lindeth (which is not included with Silverdale census data in the earlier censuses).

Column 3. The number of farms is estimated from census data and from Ordnance Survey plans. The total taken as constant over the years, since the same buildings were adapted as residences if not used as farms.

Column 4. The number of houses multiplied by the yield from a typical house roof - Type B in earlier table - with an area of 81 square metres.

Column 5. The number of farms multiplied by the yield calculated for Waterslack Farm, taken as typical. The yield from farm buildings is included.

The figures are very approximate, since assumptions are made about the average roof size for houses and for farms. Yield will vary with rainfall, and not all roofs would be adapted for efficient collection of water. Figures for 1951 and 1961 are hypothetical since piped water arrived in the village in 1938. They are included to show that roofwater supplies could not have met the consumption figures supplied by mains water.

APPENDIX C

WILLIAM DODD - CHRONOLOGY

- 1838 b.Kirkby Lonsdale (25 October). Father William Dodd; mother a daughter of William Benson of Kirkby Lonsdale.
- m.Elizabeth Tiplady - (surname not known) of Kirkby Lonsdale.
- Sometime High Bailiff of Kirkby Lonsdale County Court.  
Sometime member of Kirkby Lonsdale Local Board (chairman for a short time).  
A Director of the Elterwater Gunpowder Company.
- 1868 Daughter Mary b. Kirkby Lonsdale (7 December).
- 1872 Son Matthew William b. Kirkby Lonsdale (25 April).
- 1882 Elected member of Lancaster Rural Sanitary Authority for Silverdale and Yealand Redmayne.
- 1885 Daughter Mary died at Green Close, Silverdale (18 February) aged 16.
- 1892 Son Matthew died at sea (19 March) aged 19. Buried at sea in the Pacific Ocean.
- 1894 Qualified as a magistrate for Lancashire.  
Appointed Chairman of Silverdale Parish Council (31 December).
- Represented Silverdale on Lancaster Board of Guardians and on the Rural District Council.
- 1897 His wife Elizabeth died (3 March) at Green Close, Silverdale.
- 1902 Member of South Lonsdale Education Committee (founded 1902).
- 1910 Died (18 February) at Green Close, Silverdale.  
Buried in Silverdale burial ground (the grave is on the north side, close to Park Road).

APPENDIX D. CONTEMPORARY ESTIMATES OF THE COST OF PROVIDING PIPED WATER FOR SILVERDALE AT VARIOUS DATES FROM 1898 to 1937

- 1898 Estimates of the cost of a pipeline from the Thirlmere aqueduct to Yealand Conyers and Yealand Redmayne were prepared. Extension of the pipeline to Silverdale was not considered feasible since the extra cost would make the whole scheme too expensive.
- 1901 The cost of a six-inch pipeline from the Thirlmere aqueduct to Yealand Conyers, Yealand Redmayne and Silverdale was estimated to be £7554.
- 1903 A scheme to lay a pipeline across Morecambe Bay from Bolton-le-Sands was estimated to cost £4500. Silverdale rates would be increased by about 6 pence in the pound, and the cost of the bulk supply, from Lancaster Borough waterworks would have been 8 pence per thousand gallons.
- 1907 The cost of joining the Lupton Scheme (South Westmorland Rural District Council) was estimated at £2720. The bulk supply would have cost 8 pence per thousand gallons.
- 1909 The Local Government Board expressed the view that a supply of piped water could be provided for Silverdale at a cost that "...should not be prohibitive."
- 1930 Extension of the Lupton Scheme pipeline from Arnside to Silverdale suggested, at a cost of £15,000. It would also be necessary to build a service reservoir.
- 1933 Silverdale ratepayers were obliged to pay an additional rate of 3 pence in the pound to help subsidise a piped supply to Thurnham and Cockerham.
- 1936 The Lancaster Rural District Council accepts a grant of £750 from the Ministry of Health towards the capital cost of a scheme to provide piped water to Yealand Conyers, Yealand Redmayne and Silverdale.
- 1937 The Lancaster Rural District Council raises a loan of £27,400 from the Public Works Loan Board to pay for the piped supply to the Yealands and Silverdale. Loan charges amount to £1460 per annum, divided as follows:
- |              |  |
|--------------|--|
| £514         | from Lancashire County Council               |
| £514         | from Lancaster Rural District Council        |
| £432         | from the parishes receiving the water-supply |
| <u>£1460</u> | total  |
- To raise its share of the loan charges the Rural District Council levied an additional rate of  $2\frac{1}{2}$  pence in the pound over the whole of the Rural District. In Silverdale Parish an additional one shilling in the pound rate was levied (as well as the  $2\frac{1}{2}$  pence).
- 1938 At a meeting of the Lancaster Rural District Council on 26 February it was decided that the following charges would be made for piped water in Silverdale:

For private dwelling houses:

<u>Rateable value</u>	<u>Water charge</u>	<u>Minimum</u>
Up to £30	10% per annum	5 shillings a quarter
£30 to £40	£3 per annum fixed charge	
£40 to £100	7½% per annum	
Over £100	To be fixed by the Council	

Farms and farmhouses:

Metered and charged at 2 shillings per thousand gallons.  
Meters to be bought by the occupiers.

Use of hosepipe: 10 shillings per annum.

Water for trade and manufacture: only by special agreement.

APPENDIX E. EXPLANATION OF FIGURE 5 - GRAPH SHOWING SUPPLY AND DEMAND FOR WATER IN SILVERDALE FROM 1830 TO 1960

The orange line at the bottom left of the graph shows the estimated demand for water in the village in the period 1830-1850. It is based on consumption figures suggested by Balchin<sup>1</sup> and figures for the population of Silverdale.

The brown line shows the estimated supply from public wells in the central part of the village. It was probably sufficient to meet demand in the first half of the nineteenth century.

The green line is a rough estimate of the total yield of roofwater for the whole of Silverdale (including Lindeth)<sup>2</sup>. The plotted line suggests that roofwater could have given reasonably adequate supplies in the second half of the nineteenth century. It should be remembered, however, that distribution of roofwater was very uneven, the supply that each family received being naturally dependent on the size of their roof. The figures for potential roofwater supply have been extended beyond 1938 (the year that piped water arrived in the village) to demonstrate that by 1960 supplies of roofwater would have fallen far short of the demand, shown by the blue line.

The blue line shows the actual consumption of water by Silverdale when the village was connected to a mains supply, from 1938. It is plotted from meter readings taken at the supply point on the Thirlmere aqueduct.<sup>3</sup> As the meter readings include water supplied to Priest Hutton, Yealand Redmayne and Yealand Conyers, the totals have been reduced by a factor of five-eighths - based on the proportion of Silverdale residents to the total population served by the pipeline. The steeply-rising curve suggests that there had been a pent-up demand for water in Silverdale before mains water arrived. When supplies became plentiful, consumption rose rapidly.

The red line shows the level of consumption that would have been expected in Silverdale if the village had had a long-established piped supply before the 1930s. It is calculated from the population of the village multiplied by average per capita consumption figures for the period 1938 to 1957 for areas of England and Wales that had long enjoyed piped supplies.<sup>1</sup> The blue curve rises steeply to meet the red curve, as Silverdale adjusts its consumption of water to average national levels.

Notes

1. W.G.V. Balchin. 'A Water Use Survey', Geographical Journal, 124 (1958).
2. Calculations in Appendix B.
3. Lancaster R.D.C. Meter Readings for Ellel and Silverdale. Lancaster Public Library Reference Department MS 8368.

APPENDIX F. REFERENCES TO SILVERDALE WELLS IN PARISH MINUTE BOOKS

Abbreviations: Silverdale Ratepayers Minute Book SR  
 Silverdale Parish Council Minute Books SPC  
 Silverdale Parish Meeting Minute Book SPM  
 Warton with Lindeth Parish Council Minute Book WLPC

- Bank Well - Cleaning out: SPC July 1898, March 1899, June 1900, August 1913, July 1929, July 1933.
- Burton Well - Repairs and cleaning out: SPC May-June 1898, January 1907, May 1910, July 1910, September-October 1911, March 1912, June 1912, September 1912, November 1912, March 1913, August-September 1914, September 1915, September 1920, November 1928, September 1929, March-April 1930, March 1932, May-June 1932, April 1915, November 1915, May 1933, April 1934, July 1934, April 1936, February 1938.
- Well damaged: SPC July 1915, October 1928, February-March 1933, July 1934, June 1937.
- Frost damage: SPC March 1913, January 1914.
- Water very low: SPC July 1934.
- Site meeting: SPC April 1934.
- Cove Well - Repairs to pump: SR March 1853; SPC August 1898, March 1902, September 1902, July 1903, January 1904, July 1905, September 1905, November 1905.
- Water saline: SPC April 1902.
- Dogslack Well - Repairs to pump: SPC September 1897, June 1901, May 1902, November 1905, January, April, July 1906, January 1908, July-August 1910, November 1914, July 1915, March 1916, April, July 1920, July 1924, June 1927, September 1927, January, November 1928, July 1929, July 1931, May 1937.
- Frost-proofing pump: SPC October 1929.
- Access obstructed: SPC May 1909, March-April 1913, July 1914, May, July 1916, May, August, September 1928, April 1929, November 1930, July, October, November 1931, July 1932, July, October, November 1933, June-July 1937.

- Elmslack Well
- Description of well: SPC November 1905, April-May 1925.
  - Repairs and cleaning: SPC March, September 1902, November 1912, July, September 1925, October 1931, September 1936.
  - Pump broken - removed: SPC November 1934.
  - Access to well impaired by Mr Deason: SPC September-November 1905, July, September, November 1908, January, March 1909, December 1912, January 1913.
  - Access impaired by Mr McIntyre: SPC April, July, September 1922.
- Stankelt Well
- Wall to be repaired: WLPC January 1932.
- Storth Well
- Description of well: SPC April 1902.
  - Well inspected: SPC March 1934, June 1936.
  - Well cleaned out: SPC July 1898, March 1902, November 1906, September 1909, April-May 1911, January 1927, December 1927, March 1936.
  - Offer to buy well and surrounding parish land: SPC September 1900, April 1902. SPM March 1902.
- Waterslack Well
- Railway Co. lays pipe to trough: SR December 1856.
  - Dispute over pipes laid to trough: SPC February 1893, September 1893, July, September 1895, July, September 1899, May 1911, August-December 1911. Also in Lancaster Rural Sanitary Authority Minute Book January-March 1893, September 1893; and in Lancaster Rural Sanitary Authority Letter Book October 1892, January-October 1893.
- Woodwell
- Complaint that Silverdale Residents are using Woodwell: WLPC June 1911.
  - Cleaning and repairs: WLPC October 1899, July 1901, July 1906, June 1910, May-July 1919, April 1925, January, April, July 1926, April, July 1927, July, October 1930
  - Improvements following takeover by Silverdale: SPC April 1935, June-September 1935, November 1935, January 1936, April-July 1936, December 1936, February-March 1937, September 1937, January-February 1938. SPM March 1936.
- General
- All watering places checked: SR March 1853; SPC September 1905, April 1928.
  - Public meeting concerning possible encroachment by railway company: SR June 1856.
  - Rural Sanitary Authority to take over wells and pumps: SPC March 1891, November 1892, January, September 1896.