**Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage, and supply of water, and the sanitary condition of the inhabitants of the town of the Ashby-de-la-Zouch / by William Lee, Superintending Inspector.**

### Contributors

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16

# PUBLIC HEALTH ACT,

(11 & 12 Vict., Cap. 63.)

# REPORT

TO THE

# GENERAL BOARD OF HEALTH,

ON A

## PRELIMINARY INQUIRY

INTO THE SEWERAGE, DRAINAGE, AND SUPPLY OF WATER, AND THE SANITARY CONDITION OF THE INHABITANTS

OF THE TOWN OF

# ASHBY-DE-LA-ZOUCH.

BY

WILLIAM LEE, Esq.,

SUPERINTENDING INSPECTOR.


LONDON:

PRINTED BY W. CLOWES & SONS, STAMFORD STREET,

FOR HER MAJESTY'S STATIONERY OFFICE.

1849.

# NOTIFICATION.

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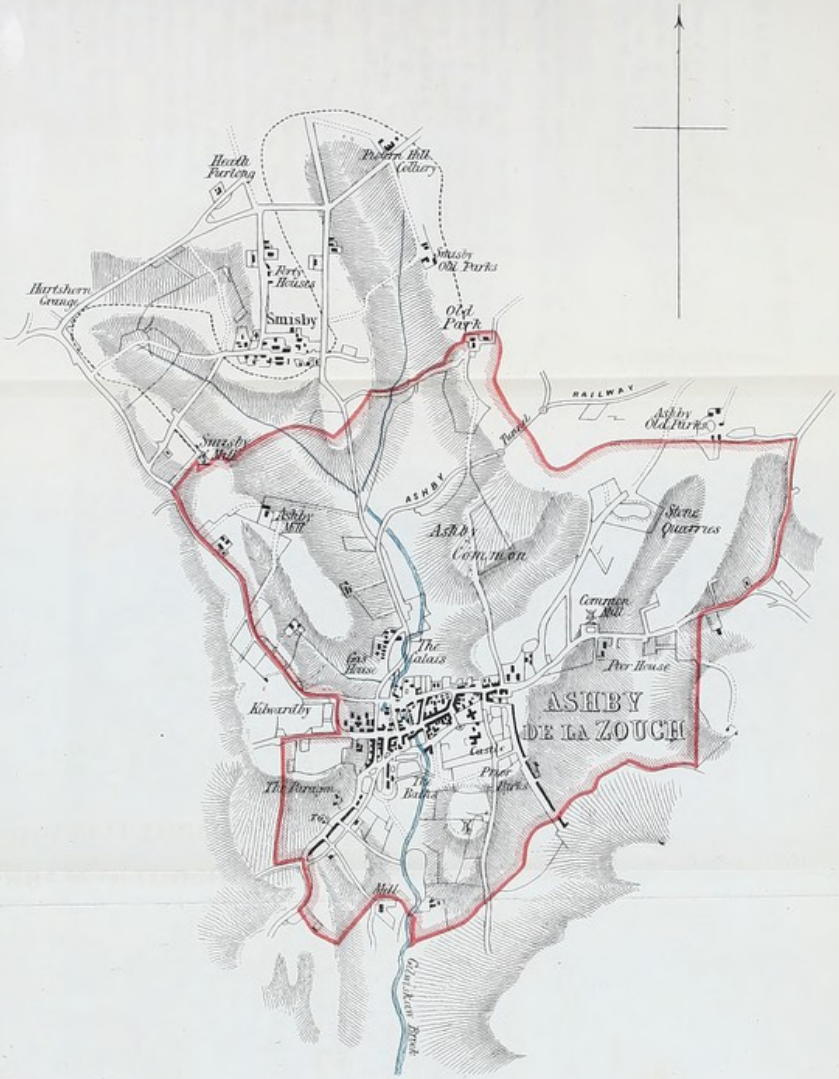
The General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that on or before the 7th July written statements may be forwarded to the Board with respect to any matter contained in or omitted from the accompanying Report on the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants, of the Town of Ashby-de-la-Zouch, or with respect to any amendment to be proposed therein.

By order of the Board,

Henry Austin, *Secretary.*

*Gwydyr House, Whitehall,*
*1st June*, 1849.

# ASHBY DE LA ZOUCH.

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# PUBLIC HEALTH ACT (11 and 12 Vict., cap. 63).

*Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the Town of* ASHBY-DE-LA-ZOUCH, *in the County of Leicester.* By WILLIAM LEE, Esq., C.E., Superintending Inspector.

MY LORDS AND GENTLEMEN,

IN obedience to your directions I have to present to you the following Report on the sanitary condition of Ashby-de-la-Zouch.

I was accompanied during my inspection of the town by the following gentlemen, whose assistance during the inquiry I beg to acknowledge :—C. A. Dalby, Esq., surgeon ; Joseph Kidger, Esq., land surveyor ; Robert Chaplin, Esq., architect ; Edward Mammatt, Esq., gentleman ; John Mammatt, Esq., agent to the Marquis of Hastings ; William Dewes, Esq., solicitor, clerk to the justices ; Thomas C. Dewes, Esq., gentleman ; Mr. Knight ; Mr. John Salisbury, builder ; Mr. Usherwood.

PARISH OF ASHBY.—The parish of Ashby is stated to be the largest in the county of Leicester. At one period it included eight separate hamlets, Blackfordby, Boothorpe, Glen, Balcroft, Swartcliffe, Woodcote, Cales or Calais, and Kilwardby ; of these, two only, Blackfordby and Boothorpe remain distinct. Calais now forms part of the north side of the town, and still retains its name. Kilwardby formerly stood on the site of that part of the town now called Kilwardby-street ; of the remaining four there are now no traces existing. The extra-parochial lordship of Alton Grange, two miles from the town, is within the precincts of the parish.

Ashby Woulds are situate to the west, and extend between three and four miles from the town, forming a wide district comparatively destitute of inhabitants.

The parish is bounded on the west by Church Gresley, on the north by Smisby, on the east by Coleorton, and on the south by Packington.

The Marquis of Hastings is lord of the manor of Ashby, and owner of a great portion of the land in the parish. I shall have to mention hereafter the large sums already expended by his lordship's family in the hope of improving the prosperity of

the place; and also to show the important arrangements he is able and willing to make for the water supply and improved drainage recommended in this Report.

John Mammatt, Esq., his lordship's agent, stated in his evidence, "I may say, once for all, that everything that Lord Hastings can do for the better sanitary condition of the town will be done."

I have introduced his lordship's kind intentions with reference to the application of the Public Health Act to the town thus early in my Report, in order to mention that he has a strong objection to the inclusion of the whole parish, but especially of the agricultural land, within the intended district.

In accordance with my instructions from the General Board, I explained to his lordship's agent that the agricultural as well as every other part of the district, would be protected from contributing more than its fair share of the rates, proportioned as nearly as practicable to its share of the advantages to be derived from the application of the Act.

As the objection, however, was reiterated, I felt it my duty to examine those portions of the parish carefully, and to weigh well the probable effect of such an arrangement upon the sanitary condition of the town. After a full consideration, and a second visit to the town, I can safely recommend the exclusion of nearly all that portion lying to the west and south-west of the road leading to Burton-upon-Trent; and also the extra-parochial place called Alton Grange, which contains only three houses and from 500 to 600 acres of land; but I cannot recommend the omission of any portion of the agricultural land having its watershed towards the town of Ashby. The whole of this forms one natural drainage area; it is essential for the proper water supply of the town, and its condition, for good or evil, must always exercise a considerable influence upon the health and lives of the inhabitants of Ashby-de-la-Zouch.

Character of the Soil and Subsoil and Geological Strata.—The surface-soil is a vegetable mould of a fertile character, and from one to two feet deep. The subsoil on the north and east is a scurry, or broken sand and gravel, varying from 6 to 20 feet. On the south and west, clay and blue bind of the coal measures. On exposure to the atmosphere it rapidly changes into agricultural soil. Mr. Kidger, surveyor, says in his evidence, "When I lived in Ivanhoe-road I had a garden behind the house, and in order that I might have a clean fence, I earthed up the quicksets with the subsoil, and in less than two years found that it had become a fine friable soil. I have known other instances of whole fields so changed after being drained; this shows the importance of drainage in altering the character of subsoil."

On the hills to the west are cappings of diluvial drift, denuded on both sides; Strawberry-hill, west of Kilwardby-street is an instance of this.

The coal measures reach the surface on the south and west of Ashby, but under the great portion of the town, especially the north and east, they are covered with the lowest member of the new red sandstone system, which appears here, and towards the north, as a soft yellow sandstone.

Edward Mammatt, Esq., says in his evidence, "The whole of the district within a radius of five miles is extremely broken, dislocated, and distorted, in faults or slips varying from 1 foot to 300 feet, but these faults do not affect materially the surface immediately adjacent to them. I attribute the number, and great volume of the springs to the existence of these faults."

The general rise of the strata is to the east, the beds resting on the flanks of the igneous rocks which are protruded at Charnwood Forest, a few miles distant. The whole subsoil and mineral strata are well adapted for natural and artificial drainage.

The yellow gritstone has been used to some extent for building purposes, but there is no material in the immediate vicinity sufficiently hard for roads. The Ashby Coal Basin is 35,000 to 40,000 acres in extent. The price of coal delivered in the town varies from 6*s*. to 13*s*. per ton, according to quality.

In the coal measures about three miles distant there was discovered, about 37 years since, at the depth of 600 feet from the surface, a very copious saline spring, the water of which was perfectly pellucid and colourless. On analysis by Dr. Ure it was found to contain 3,700 grains of common salt, and six grains of bromine per imperial gallon. The Marquis of Hastings determined to lay pipes, and convey this water to the town. He then erected very elegant and commodious baths, a large hotel, and a number of handsome houses, called Rawdon-terrace, suitable for private lodgings. These buildings cost altogether upwards of 20,000*l*. The expense of laying the pipes was not incurred for the reasons stated in the next paragraph. The spa water has continued to be carried in cisterns by canal and railway.

William Dewes, Esq., says, "For a few years the baths were well frequented, there was a considerable influx of company to the town, and great benefit was derived from it by the inhabitants. After that time the visitors decreased, until now it can scarcely be called a bathing-place. I attribute this mainly to the disagreeable state of the atmosphere in the immediate vicinity of those buildings, and to the effect generally produced by it on the town. The drainage and sewerage of the town is most defective. The town is infinitely worse than if it had no drains."

The contour of the whole parish is very favourable for the discharge of surface-water. A rivulet, called the Gilwiskaw, but more usually "the Brook," runs through the town in a direction nearly due south; it is from six to nine feet wide, and drains about 1300 acres of land. Its course is nearly at right angles with the principal streets. About one-third of the town lies on the west, and two-thirds on the east side of the stream.

The altitude of the town is more than 300 feet above the level of the sea.

The surface of the town, and its adjacent suburban lands form an irregular basin, about two miles in length from north to south, and one mile in width. The hills rise to a height of about 150 feet, from the brook in the town to the watershed. On the south, immediately below the town, the valley is not more than a quarter of a mile wide, but the inclination of the brook is sufficient to constitute an excellent natural outfall.

It would be difficult to conceive a site better adapted by nature to secure the health, comfort, and prosperity of its inhabitants than that of the town of Ashby-de-la-Zouch, and I think it would be equally difficult to find a town, of its size, more entirely destitute of all sanitary arrangements.

The consequences of this defective condition upon the health and lives of the inhabitants will be clearly seen from the following calculations which I have made from the returns furnished for this inquiry by Mr. John Davenport, the Superintendent Registrar.

Population and Excessive Mortality.—The population of the parish of Ashby according to the census of 1841 was 5,208, and the number of houses 1,039; being an average of five per house.

With reference to the infantile mortality, which is considered one of the best tests of the sanitary condition of any town, because it is independent of migration, emigration, and the numerous casualties affecting adult life: in the whole *Union* of Ashby-de-la-Zouch the proportion of deaths of infants under one year to the births is 1 in 9, but in the town of Ashby it is 1 in 6. For more definite and close comparison, however, I have selected the parish of Smisby, immediately contiguous to Ashby, and I find that, of the whole number of deaths in each, 26 per cent. die in the town of Ashby, under one year old; in Smisby only 9 per cent. Under 5 years old, in Ashby 45 per cent.; in Smisby only 18 per cent. Under 15 years, in Ashby 50 per cent.; in Smisby only 27 per cent. Under 20 years, in Ashby 58 per cent; in Smisby only 37 per cent. So that in the town of Ashby one half of all the deaths are under 15 years of age, while in Smisby the proportion is only about one-fourth.

Unfortunately this excessive mortality is not confined to infants; the average age of all the deaths in Ashby is 26 years and 4 months; in Smisby it is 28 years and 1 month. While the average age of all who die in Ashby above the age of 20 years is 53 years and 6 months only; the average of Smisby is 63 years and 3 months.

It appears, therefore, that as compared with Smisby, every individual born in the town of Ashby loses nearly two years of life, and that every adult loses nearly 10 years.

The pecuniary loss caused by this excess of deaths may be set down at an average of 5*l.* for each funeral; but beyond this, there is a loss of productive labour at not less than 10*s.* per week for each male, and 5*s.* for each female, or 7*s.* 6*d.* per week average. In addition, it is found that for every death in excess, there have been at least 28 cases of sickness in excess, the expense of which cannot be less than 1*l.* each.

There is no essential reason why the town of Ashby should not be as healthy as the parish of Smisby, and yet, in comparison, *every adult inhabitant of Ashby loses one-sixth of his life*, and the total money loss on the year's deaths is as follows:—

| | £. |
|---|---|
| From excess of sickness . . . | 519 |
| From excess of funerals . . | 92 |
| From lost labour . . . | 1,984 |
| | £2,595 |

State of the Gilwiskaw Brook.—Among the causes of the diseases common in Ashby is the foul state of the brook course. Immediately below the town is a mill dam, which has existed from time immemorial. It is the property of the Dowager Marchioness of Hastings. Mr. John Mammatt stated, that he had no doubt the pound might be done away with, on payment of some compensation, except that a small carrier must continue for the irrigation of about 40 acres of land below the railway embankment.

Besides this a sluice appears to have been put down about seven years since for the irrigation of the meadows in front of the public baths, above the railway, and complaints were made that when the process of irrigation was going on there, the whole of the drainage of the town was pent up as far as the old stone yard on the upper side of Market-street. On examination I found that the brook is contracted just below the Ivanhoe-road, and at the grooves of the sluice it is 6 feet wide and 4 feet deep. This was stated to be full when the meadows were under irrigation. Immediately above are two

public drains, one of them from the baths and adjacent houses. When these outlets are closed, the water is dammed up, the refuse stands in them for a great distance, and the foul gases are driven back into the buildings, and through the gratings of the streets. Another consequence of this sluice is, that 12 inches deep of solid refuse requires to be taken out of the brook course every year, from thence to the mill below.

The brook adjoins Turk's Head Yard, and emits there an intolerable stench; privies are built so as to empty their soil into it. Under one of them about half a cubic yard of night-soil lay exposed in the bottom of the brook. Mr. Dalby stated that there had been several cases of fever in the yard.

The brook passes under Kilwardby-street, by two circular culverts which could be easily lowered if necessary. In the old stone-yard it receives another open brook from Locks-hole; this also contains a large quantity of solid refuse. The inhabitants of Brook-side, above the old stone-yard, complained very much of bad smells arising from the brook, and Mr. Dalby said, that he had always cases of continued low fever there, and had had several of virulent typhus, which had proved fatal.

Alongside Derby-lane, and at the back of the Green, the brook is in a most filthy state, from the quantity of night soil and other refuse emptied into it, Here again Mr. Dalby stated, had been many cases of fever and diarrhœa.

The Calais spring rises a few inches above the level of the brook on the north side of the town. It is closed on three sides, and covered as a well for dipping vessels, but in consequence of the foul state of the brook, and the accumulations in its bed, the well is frequently polluted. Mr. Dewes says, "I have known the Calais spring for 50 years. Until 10 years ago the water was of the best quality possible. It is naturally a very fine spring, I never knew it fail. The brook bottom has been gradually raised, and the water has become very foul."

Several of the neighbouring inhabitants complained bitterly of the pollution of this, their only supply of water.

A glue manufactory has been established about 18 years at the upper end of the town, and the proprietor passes the brook stream through his works and returns it to its course, containing, besides refuse in solution, a large quantity of white flocculent animal matter in suspension. He has also dammed up the water about 6 inches for his own purposes.

There are no buildings above the glue works, and the brook is there consequently a pure, sparkling, pellucid stream.

Its present bed, entirely through the town, is only about two feet below the level of the ground on each side, and as all

the underground drains of the town are made to fall into it, there is not one sufficiently deep to drain any building, and they are all in the most pestilential condition.

I have said sufficient to show that the present state of the brook is the great evil of Ashby-de-la-Zouch, and have noticed it simply as it appeared in the course of my inspection of the town, to avoid swelling out this Report with the voluminous evidence given by almost every witness during the inquiry.

On two important points, which did not come under my personal observation, I quote the testimony of Mr. Kidger, surveyor, and Mr. Dewes, solicitor.

Mr. Kidger says, "There is frequently a heavy, damp fog lying on the surface of the meadows, north and south, on both sides of the town, I have seen it scores of times. On Smisby Common, one mile from the town, I have frequently been able to read a newspaper by the light of the moon, but on reaching Calais could scarcely see my horse's head."

And Mr. Dewes says, "The brook has been getting gradually worse, the obstructions have, from time to time, increased, and instead of being, what I remember it, a place in which we were in the habit of bathing when young, it has now become a filthy ditch; and during the summer months, especially, miasma is given off in an extraordinary degree, so much so, as in my opinion, to render it highly prejudicial to the health of all within its influence. There is such an amount of noxious vapour from the brook, between the Ivanhoe-road and the railway embankment, that, in an evening, in warm weather, or before rain, it would be dangerous to come within 300 or 400 yards of its course. I have constantly avoided it when I could."

State of the Drainage.—I have already stated that there is no deep drainage in the town. In describing the existing drainage, as briefly as possible, I shall reserve the bulk of the evidence, for reference, if it should be necessary, at any future period.

Mr. John Salisbury, who has constructed many of the existing drains, called sewers, says:—"There is one from the Bath gate down to the Sluice, about 4 feet deep. It is 24 inches by 18, and cost 5*s.* per yard. It is constructed of arch bricks *without* lime. It is about 120 yards long, and is the deepest sewer in Ashby. The ordinary depth of the sewers from the surface is from 2 feet to 2 feet 6 inches; the cost from 3*s.* to 4*s.* 6*d.* per yard."

In part of Ivanhoe-road there is a sewer, which Mr. Salisbury stated was 2 feet deep from the surface, 12 inches by 9 inches, with flat top and bottom, and falling with the inclination of the

road; half full of deposit. The brook backs up into it during floods.

*Ivanhoe-terrace* is the property of Mr. Wright; two of the houses have been empty many years. No one can live in them, in consequence of the intolerable effluvium caused by the bad drainage and contiguity of the brook. Neither meat nor fish will keep. Mr. Dalby, surgeon, stated, that he should have taken one of them but was deterred by the stench. Mr. Kidger said, "The houses were erected for lodging-houses for the use of visitors to the baths, and formerly let for 60*l.* per annum; they *might now be had for* 30*l., or even less.*" "I should have bought one of them," he adds, "but for the offensive stench; I could have had it for 450*l.*, but refused."

Between Ivanhoe-road and Market-street are many long courts in the most deplorable condition; the whole of the soil and subsoil being saturated with decomposing animal and vegetable matter.

Having given an instance of the deterioration of first-class houses for want of efficient drainage, I add a description of a cottage, given to me by the wife of the occupant.

*West-court*, in Turk's Head-yard, contains five houses, and is built up on all sides; the drainage is stagnant, and the privy filthy. Mary, wife of James Poyser, says, "I have lived in this court 18 years. Have had 11 children; 7 are now living. Have been frequently sick; my complaints are generally in my stomach and bowels. We pay 1*s.* 6*d.* per week rent. *Have no supply of water. The walls of the house are damp, and the floor also. The drains are stopped up. We cannot get the water away at all without probing with a stick.*" Mr. Dalby stated that this was one abode of continual fever.

A drain passes from the neighbourhood of Lower Church-street through many of the houses situate between Market street and Ivanhoe-road, and I was informed that in a time of flood it frequently forces up the stones of the house floors, and that the floors of the house have to be taken up to cleanse it.

Mr. John Kelsey said that the smells from this drain were awful. It became choked in 1847, and Mr. Dalby informed me that he had three cases of typhus at the time, on the spot where the obstruction took place.

In *Gascoigne's-yard* are several open privies without ash-pits, the soil forming the most unsightly pools. There are eight pig-sties in the yard; about 20 loads of pig and stable manure, in heaps, without any receptacle, and an open, stagnant drain, nearly two feet wide, on *each* side of the yard. Mr. Dalby stated that he is never without fever and sickness here.

In *Kilwardby-street* are some of the best houses in the town. I examined the one occupied by Mr. Dalby, to ascer-

tain the effects produced on the structure by want of drainage. The floors of the rooms are damp, and the flags in the hall decaying, and rising in thin shells. There is a well and pump used regularly to prevent the cellars from becoming filled with sewage from the street. No use is made of the cellars. The lower parts of all the doors passing from one cellar to another are rotted away. The joints of the bricks for some height above the foundation are open, and the building seriously injured. Mr. Kidger, surveyor, said that he lived within a few doors of Mr. Dalby's house for 10 years, and that he never, during that time, used his cellars for any purpose whatever. He put down a drain from the sewer in the street to the pump-grate in his yard, but the effluvium made the house intolerable.

He added, "I have had 11 children, and all of them, except one, have been at some period given over by the doctors. The disorders were fevers. We have none of us had sore throats since we removed; previously we were seldom without."

This part of the Report, which displays the characteristic evil of Ashby, has exceeded the limits which I intended to assign to it, though the evidence is very far from being exhausted. I shall therefore only add an extract from the evidence of Robert Chaplin, Esq., architect, showing the effects produced by bad drainage upon the durability of buildings. He says, "I am well acquainted with the state of the subsoil of Ashby as affecting buildings. For want of drainage, the clay and gravel is completely saturated with moisture, causing the walls of buildings, considerably above the surface, to be constantly damp, and the houses to be very unhealthy. Great injury is undoubtedly done, not only to the materials of the lower parts of the buildings, but their stability is much endangered. A great number of houses, especially those of the lower classes, are considerably out of perpendicular. Inside the houses the plaistering crumbles away, and outside, mosses grow on the bricks for a foot or more in height."

Evil construction of Privies.—In many parts of the town privies are constructed under sleeping-rooms. In a majority of those which came under my notice, there is neither drain, cess-pool, nor ash-pit; and on inquiring how they were emptied, I was informed, that the only means available was to scoop out the soil from under the seat and carry it away in buckets. I have already adverted to the numerous instances of privies emptying their contents directly into the brook.

Surface-cleansing.—The surveyors of highways execute what cleansing is done, with the exception of the principal street, where the inhabitants pay to a poor man from 1*d.* to 6*d.* per

week each house for sweeping and removing the refuse. A private subscription is also made, amounting to 14*l.* or 15*l.* annually for watering the same line of road during the summer months. The courtyards are never cleansed or cared for.

State of Burial-grounds.—A superficial inspection of burial-grounds affords very inadequate evidence of their real condition, and I regret to say that the testimony of the witnesses shows some difference of opinion to exist. The Rev. Marmaduke Vasavour, the vicar, was prevented from attending, after the first day of the inquiry, but I received some important evidence from Mr. John Mammatt. He says, "I reside at the manor-house, near the parish church burial-ground. The churchyard is in a very crowded state; additional room is absolutely necessary. I see graves open frequently; in nine out of ten cases the remains of the dead are disturbed and exposed. I am of opinion that interments ought not to continue amidst the dense population of the town. The graves vary from 4 to 8 feet deep. The soil for a depth of 4 feet is a rich loam; below that a stony shale, at least 30 feet thick. In the lower part of the churchyard the graves are wet, in the upper, dry. In 1812 a faculty was obtained, by which half an acre was added to the burial-ground of the parish. There is a drain through the part added in 1812, but it existed before that time. In the new part there are some spaces left between the graves, but this has not been done in any systematic manner, nor with any definite object.

"There is a burial-ground connected with Trinity church, but the interments are not numerous there. The ground has only been opened about six years. There are no burial-grounds attached to any of the dissenting places of worship. The sights frequently presented by the parish churchyard are of a very painful character. There has been no proposal for the formation of any public cemetery."

I have since received a communication from the vicar, in reply to some inquiries addressed to him. The substance is as follows:—The parish churchyard contains, exclusive of the church, about an acre and a quarter, and Trinity church, one rood and a half. The annual number of interments in the former will average 83. The soil is very good and dry in the parish churchyard, and lies rather upon an elevation. The burial-ground at Trinity church is at present wet. The depths of the graves are from 4 to 6 feet, never less than 4 feet from the surface. *No offensive effluvia arises from either of the graveyards.* Corpses generally remain from 12 to 14 years undisturbed in the parish churchyard; in Trinity churchyard but few interments have as yet taken place. There have been no interments in the parish church itself of late years.

Present Water Supply, Public Springs, &c.—There is no public supply of water in the town. There are several public wells with very copious streams, but none of them have been made available for the general use of the inhabitants. The bath pump spring is conveyed by pipes a short distance. It is a mineral spring, constantly giving a stream about 1½ inches diameter. It merely runs out at the surface, and has no hydraulic force. I have already alluded to the Calais spring, in describing the state of the Brook course. The diameter of its discharge is about 1½ inches, and like the Bath spring it only reaches the surface. The Holywell is the most copious of these public springs. It rises about one mile from the market-place, to the north-west, and is 50 feet altitude above the tramway at the wharf yard near Rawdon-terrace. The water is very bright but hard, although under the disadvantageous circumstances in which they are placed it is much prized by the inhabitants. The flow never varies throughout the year. Lord Hastings has a three-inch pipe from this spring to the baths, the hotel, and Rawdon-terrace exclusively. Besides this, an open conduit conveys down to Calais a stream which would fill a six-inch pipe.

Lawn spring is a much softer water, though issuing from the same stratum. It rises about half a mile north-east of the town, and gives a stream about 1½ inches in diameter. Its altitude is about 150 feet above the tramway already named.

There are many private wells in the town. They are sunk in the ordinary way, and all require pumping or drawing. The supplies are scanty and very variable. The depth of the wells is from 2 yards to 20. Much of the water from these wells in the lower part of the town is said to be unfit for culinary purposes. Many of the inn-keepers send water-carts to the public wells to obtain water for brewing, and do not take it from their own private wells.

About a year and half since, there was a fire in the Bull's Head yard, and within a short time previously two others, one in Market-street, and the other in Wood-street. Upon each of these occasions the private wells became speedily exhausted, and if the fires had not been fortunately subdued, in the buildings in which they originated, the whole town would have been, within the space of a quarter of an hour, at the mercy of the devouring element.

" Mr. J. Mammatt, says, " I have heard many complaints of wells rendered foul from inefficient drains. I consider the present water supply totally inadequate."

John Johnson, Esq., manager of the Ashby branch of the Leicestershire Bank, and agent for the County Fire Office, says, in his evidence, " I recollect four fires within the last two or three years: the want of water was very lamentable. A better

supply is absolutely necessary for extinguishing fires as well as for the general wants of the inhabitants."

According to the best evidence I could obtain, a well 20 yards deep, and pump, would cost as follows :—

| | £. | *s.* | *d.* |
|---|---|---|---|
| Excavating . . | 7 | 10 | 0 |
| Brick-walling, three feet diameter | 4 | 10 | 0 |
| Pump and appendages . . | 7 | 0 | 0 |
| Wood-work, say . . . | 1 | 0 | 0 |
| Total . . | £20 | 0 | 0 |

Besides the first outlay, they are a constant source of expense in repairs, &c. Mr. Kidger says: " I should think that the average cost of repairing pumps would be not less than 10 per cent., because the supply of a pump well falling off, the owner sinks his well deeper; then his neighbour does the same, and so on, one against the other continually."

There are female water carriers in the town, who sell it at one penny per pail of four gallons.

The inhabitants generally collect rain-water in butts or cisterns. These butts cost not less than from 20*s.* to 30*s.* each.

In order to ascertain the cost of the present water-supply, we will suppose each well and pump to supply four houses. The account then will stand as follows :—

Annual interest on capital sunk in well and pump, at five per cent., 20*s.* Annual repairs, ten per cent. on original outlay, 40*s.*, equal to 15*s.* per annum for each of the four houses. Butt for rain-water, according to the evidence, original cost 20*s.* to 30*s.*, but say 20*s.* These will last about 12 years with frequent painting and repairs, requiring an annual sum for that and depreciation, &c. not less than 2*s.* 6*d.* to 3*s.* Then the annual sum for buckets, cans, and other vessels and repairs, will exceed 1*s.*, and if we add for the expense, trouble and inconvenience of having to go out of doors to pump and carry in water, in all states of the weather, at all seasons of the year, and at all hours of the day, only one penny per week, we shall obtain the following result as the cost per house, for the best supply the present arrangements will afford :—

| | £. | *s.* | *d.* |
|---|---|---|---|
| Pump and well and repairs, annual . . | 0 | 15 | 0 |
| Cost and annual depreciation and repairs of butt, say . . . . . | 0 | 2 | 9 |
| Cost and annual repair of buckets and vessels . . . . . | 0 | 1 | 0 |
| Pumping and carrying water at 1*d.* per week, or per annum . . . . | 0 | 4 | 4 |
| | £1 | 3 | 1 |

Equal to more than 5¼*d.* per week, per house for water. The fact that a defective supply is only obtained at this price, proves that those whose supply is still less adequate suffer a deprivation more than equivalent, and we may, therefore, assume this as a general average. But if there should be any stoppage of the supply during repairs of pump, or from drought in summer, or frost in winter, and water should have to be purchased of the females, who sell it at one penny for four gallons, the annual amount would be considerably augmented. I shall have to allude to these figures again in estimating the cost of an improved water supply and drainage for the district.

Public Highways.—The highways and the public drains have been constructed, and are repaired by the surveyors of highways, annually appointed in March. The evidence given shows that there has been great apathy among the ratepayers respecting the election of these officers; generally the individuals who would expend the least money have been preferred. There is no public carriage-way paved with square stones, or with boulders. Market-street, Lower Church-street on one side, and portions of Kilwardby-street, have flagged and bricked footways. In the greater part of the streets the footways are paved with pebbles. Back-road, Derby-road, and Ivanhoe-road, are only gravel. There are no plans kept by the surveyors of any public works. The materials chiefly used for the carriage-ways is granite, from Marston in Warwickshire. It is brought by canal and tramway 20 miles, and delivered, unbroken, at 3*s.* per ton. It is a very excellent material. A coating three inches thick would last in Kilwardby-street, one of the principal thoroughfares, four years. Flags are brought by water from Yorkshire, and cost, including labour, 6*s.* per square yard.

A very considerable portion of the public carriage-ways is repaired by the several turnpike trusts, leaving not more than two miles to be repaired by the inhabitants. The average expenditure of the surveyors for the last seven years has been 194*l.* 7*s.* 9*d.*, or nearly 100*l.* per mile. I have very little hesitation in saying that nearly one-half of this might be saved by scientific management, and the substitution of pavements for macadamized roads.

Mr. Thomas Shaw, the surveyor of highways, says in his evidence:—"The Gas Company does great damage to the roads. I can never get the roads made as good as they were previously. If the streets were broken up by the surveyors, the work might be better done."

Defective Arrangements for the Removal of Decomposing Refuse from the Town.—With respect to the present arrangements for the removal and application of the town refuse,

I obtained some very important evidence from Mr. Kidger. He says, "My attention has been directed for many years past to the sanitary condition of Ashby. I occupy some land, and am extensively engaged as a land valuer. Under the present condition of the town, I do not know how the refuse could be removed differently; but I am satisfied that the present mode of removal is beneficial to nobody, while its continuance is an intolerable evil. The more intelligent farmers, who formerly obtained this manure, now use artificial manures, as more economical, though apparently expensive in the first instance. Any person wanting a privy and ashpit emptied would apply to men who make a business of emptying such places. Something depends upon the facility with which the soil can be got out, but in general the price paid to the tenant would be about 1*s.* per load. These men store it up on any piece of vacant land they can find *in the town,* and mix it with a portion of stable manure and other refuse; they then sell it to the farmers at about 5*s.* per load. They adulterate it with rubbish. It will cost the farmer, including labour and loading, though he may not be aware of the fact, about 7*s.* per load. Farmers are now constructing tanks on their premises, and obtaining liquid manure carts. The farms here are generally about 150 acres in extent. We estimate very highly in this neighbourhood the value of liquid manure, more especially if the refuse of the town could be obtained for that purpose."

I conclude that part of my report which has reference to the existing evils of Ashby-de-la-Zouch with the evidence of two important witnesses. Mr. Charles A. Dalby, surgeon, says: "I was appointed, about 12 years ago, Union surgeon for the Ashby district. The returns now shown to me were filled up in 1839 by order of the Poor Law Commissioners, and transmitted by me to them. Those returns show a large proportion of epidemic disease for a town in a position naturally so healthy as Ashby. In the year 1844, typhus fever prevailed in Ashby to an alarming extent. I am not aware of any *extraordinary* circumstances to which that unusual extent of fever could be attributed. It commenced in autumn, and continued through the winter. The number of cases was great, but the intensity of the disease was not more than common. The disease became in some sense endemic, and has continued to the present time in a somewhat mild typhoid form, but with occasional instances of intensely active and fatal character. During the last and present winters we had some cases among the more opulent classes, The wife of my partner was one, and the year previously his female servant. On the south side of Market-street several cases of typhus have occurred among the wealthy inhabitants. About this time last year there was one of the most virulent I ever witnessed, near the upper part of Market-street, and also

near the drain which passes under the houses lying between Market-street and Ivanhoe-road. During the present winter a bad case of typhus occurred in the same street, about midway between the two cases previously named, and also adjoining to the same drain. Besides this, there have been many of a milder form. From the Brook up past my own house in Kilwardby-street, and about me, is the most unhealthy part of the town. I have had much sickness in my own family since residing there.

"There is a very offensive drain connected with the vicarage in Upper Church-street. The Rev. M. Vasavour, the vicar, has had several cases of typhus in his own house. About the Green, and all along the line of the brook, and also in the courts already alluded to between Market-street and Ivanhoe-road, there has been much typhus and low fever of a constant kind, with diarrhœa and general debility, especially among the women, who are mostly confined to the houses.

"I attribute these diseases to the noxious emanations arising from the want of better sanitary works and regulations, and I am clearly of opinion that the causes of the above diseases, which I have enumerated as existing in the town, are removable by improved drainage, water supply, ventilation, &c.

"I believe that all my medical brethren here coincide with me in this opinion."

The other evidence to which I alluded is that of the Rev. Thomas Fell, M.A., minister of Trinity church. He says, "Along the whole course of the brook, and in the neighbourhood of the glue works, is very unhealthy. The very depressed physical circumstances of the people bear an intimate relation to their moral condition. If I were to go into another parish I should expect, from my experience here, to find that the most filthy people were the most immoral. I have been called in to see a dying man, and could not bear to enter the room until it had been ventilated for half an hour. As a general rule, one meets with the least welcome in the dirtiest houses. The social position of the people is depressed in a direct ratio to their physical and moral condition. They become careless and indifferent. There are many lodging-houses for tramps in Ashby-de-la-Zouch. I am in the habit of visiting them; they are generally in unhealthy places. The people in them herd together without distinction of sex, and the greatest immorality prevails. That immorality is connected with a filthy condition of the houses, bedding, and persons of the occupants. I should think a great advantage would arise from subjecting such places to license, and constant inspection; such inspection having reference to the cleanliness of the place, the number of the inmates, and their moral and social condition. I have been called to visit many persons sick of fever, and have found fevers most

prevalent where the drainage was in the worst state. I have resided in Ashby-de-la-Zouch 12 years, and am convinced that it much needs the application of the various provisions of the Public Health Act."

Suburban Land-drainage.—A good deal has been done in the neighbourhood of Ashby within the last 20 years, in the drainage of the suburban agricultural land; but the system of deep drains at wide distances has not yet obtained much favour. The drains are generally laid from 5 to 7 yards apart, in furrows, with occasional headers; the depth 2 feet 6 inches. This applies principally to cold land, which is considered to require only surface drains, but where water lies lower, the drains are of course deeper. The impression is becoming prevalent that deeper drains are more efficient. Where these improvements have been carried out, 5 feet is the ordinary depth used, with drains 20 yards apart.

There are no roads in the neighbourhood with deep open side ditches. The price of drainage on the old system, with tiles and soles, is 3*l.* per acre for materials, and 2*l.* for cutting and filling. The improved drainage with pipes can be completed for 4*l.* per acre.

The rent obtained for garden ground is 8*l.* to 10*l.* per acre; good farm land, from 35*s.* to 40*s.*; but on Ashby Woulds the rent does not exceed 25*s.*, and some is even as low as 15*s.* per acre.

On my second visit to examine the boundaries of the district I had a much better opportunity than before of examining the suburban land, and was convinced that the advantages of thorough drainage are not appreciated by the farmers. There are numerous water meadows above the town, on the borders of the little streams that feed the Gilwiskaw Brook, and I saw many such meadows under irrigation, although, at the same time, rushes and other aquatic plants, formed a considerable portion of the vegetation, proving incontestibly the existence already of excessive moisture and the absence of proper drainage. The fogs and effluvium said to arise from the Bath meadows after irrigation, are to a great extent, I have no doubt, attributable to the same cause; and, if so, the inhabitants of the town generally have an interest in the better drainage of the suburban lands; an interest, probably, not inferior to that of the farmer himself. It is certain that fogs and damp are caused by excessive moisture in the lands, and it is the opinion of nearly all medical and other scientific men who have considered the subject that watery vapour in the atmosphere is the vehicle by means of which the gases evolved from decomposing matter in towns are conveyed, and that such vapour has much to do with the propagation of fevers, influ-

enza, and other infectious diseases. The evaporation of large quantities of moisture from such meadows as I have described lowers the temperature, causes sudden fluctuations on every change of the wind, and injuriously affects the health of the population. These are considerations which require the serious attention of those who are desirous of improving the health of the town of Ashby.

Irrigation with Town Refuse, and its Effects.—Many years since some meadows below the town were brought under irrigation with the water of the Gilwiskaw Brook, after it had received the refuse from the drains. The fertilizing matter is of course very much diluted, but the effect on the value of the land has been most striking. The meadows contain about 40 acres, and Mr. J. Mammatt, the Marquis of Hastings' agent, though willing to give up, if necessary, the irrigation of the Bath meadows, to which the brook stream has been applied more recently, cannot surrender the advantages derived by the 40 acres below the railway embankment. He says,—"The land irrigated is worth 5*l.* per acre; without irrigation it would not be worth more than 3*l.*, certainly. The irrigation of these 40 acres is worth 100*l.* per annum. There is land in the parish which within 50 years let for 25*s.* per acre, but now lets for 5*l.* an acre irrigated."

The value to the rate-payers of a general application of the refuse of the town to agricultural purposes, in the liquid form, and with all the appliances of engineering skill and experience, may be judged of by these experiments made on a small scale. It is hazarding very little to say that such general application would more than defray the cost of all the sanitary improvements of the town.

Mr. Harrison's Plan for improving Ashby-de-la-Zouch.—I feel called upon to notice, very briefly, some plans, and a report, prepared four years ago, for the improvement of the drainage of Ashby-de-la-Zouch, and laid before me during the inquiry. With the single exception of a portion of the estimated arching of the brook, and its diversion at the Green, the whole scheme is defective, and contrary to all recognized principles of combined economy and efficiency. It is well that such a mode of draining the town exists only on paper.

General Lighting and Watching Act.—The town is under the General Lighting and Watching Act. Eleven inspectors are annually elected by the inhabitants.

The Gas-works.—Gas-works were established 17 years since, under the Joint Stock Company's Act. The public streets are well lighted. Not many private houses consume gas.

No Local Act of Parliament.—There is no local Act of Parliament in force within the parish for paving, lighting, cleansing, watching, regulating, supplying with water, or improving the same, or having relation to the purposes of the Public Health Act.

## REMEDIES.

There are no natural or artificial difficulties but what may be easily overcome, and the necessary works for improving the town can be generally constructed with great economy.

Improved Water Supply.—I have already described the manner in which the town is now supplied with water. The Holywell spring, though not sufficiently elevated to carry water to the upper stories of the highest houses in the town, would furnish a sufficient quantity for all purposes. The Lawn spring is at a greater altitude, but the supply would be deficient. It appeared evident, however, that the two, conducted by two different mains, would afford the requisite quantity, with a sufficient hydraulic pressure, using the Lawn spring for the higher parts of the town. The quality of the water, however, remained to be considered and ascertained, and as I had reason to think that the Holywell water contained a large quantity of sulphate of lime, I obtained samples from both springs, and also from the Gilwiskaw brook, above the town. These were analyzed by Dr. Playfair, who reported that the Holywell spring was equal to 26 degrees of hardness; the Gilwiskaw brook 15½ degrees; and the Lawn spring 14 degrees. This result was so unfavourable to the Holywell spring, that I was induced to calculate the money value of the soap necessary to neutralize the excessive hardness of that portion of the supply requiring soft water. In these calculations I have only assumed that five gallons of water would be required per week for washing the clothes, linen, &c., of each inhabitant. There are 835 houses *in the town*, and five inhabitants per house; and with soap at sixpence per pound, I find that there would be a loss of 265*l.* per annum from using the Holywell spring when compared with the brook water. This would amount to 6*s.* 4*d.* per house, a sum greater than I should anticipate as the whole charge for a constant supply of water; and as, in addition, the works themselves would cost about the same, whether constructed at the spring or on the brook, while the latter would have a greater altitude and pressure, I was compelled to the conclusion that the Holywell spring did not comply with that important requirement in the Public Health Act, which states that the supply of water provided shall be "proper."

I have thought it necessary to be thus particular in explaining

my reasons for adopting the land drainage water of the brook course, because I knew that the inhabitants were strongly prejudiced in favour of their springs, but were not aware that a supply from thence would really cost them twice as much money as it ought to do.

On the 5th day of April, therefore, I revisited the town, and found suitable places for reservoirs and works without the necessity of using artificial power. In estimating the extent of gathering ground necessary, I am compelled for safety to assume a low annual rain-fall, from the circumstance that no rain gauge has been kept in the district. The fall is believed to be a little under the average.

Taking the rain-fall at 26 inches, and deducting 14 inches as loss from evaporation, springs, vegetation, &c., we obtain 12 inches available for the use of the town. I have already stated that the town contains 835 houses, with an average of five inhabitants per house; and therefore, at 25 gallons per day for each individual, there would be required 141 acres of collecting ground, yielding 6,113,105 cubic feet per annum. This quantity of water would be necessary to keep the town in a proper sanitary state, and would afford sufficient for all culinary and domestic purposes; for keeping a system of pipe drainage in efficient action; for the removal immediately of all night soil, and other excreta; for public cleansing and watering of the streets and courts by the hose and jet; for extinguishing immediately on its discovery any fire in the town, without the necessity of fire-engines; and for all the other public and private purposes for which an efficient water supply is needed.

The daily supply would be 104,375 gallons, equal to 16,748 cubic feet; and in order to avoid any possibility of failure I would provide storage capable of impounding 140 days' supply. This would carry the inhabitants through the longest period of drought that can possibly happen in our variable climate. I should also recommend the construction of two reservoirs of smaller size, in preference to one large one, so that there would be no interruption of the supply at any time from accident or during repair. At an average depth of 16 feet, the storage would be equal to three acres of reservoir, which I would divide as follows:—The brook which runs on the west and south sides of Smisby drains about 280 acres of land; and there is a good site for a reservoir on the west side of the Derby-road, in two closes, belonging respectively to the churchwardens of the parish of Smisby and Sir John Harper Crewe, Bart. This I would fix at one acre in extent, so that the reservoir could be kept full, and yet any foul water, from the manuring of land or other cause, could be discharged past as refuse. For the second reservoir I would choose a site on the brook that flows to the east of Smisby, in land belonging

to Edward Mortimer Green, Esq., immediately below the lane leading from Smisby to the Old Park, or Moore's Farm; or if any difficulty should arise respecting the timber there, on some land about 200 yards higher belonging to Sir John Harper Crewe. This stream drains about 340 acres above the former, and 280 acres above the latter site. The reservoir should be two acres in extent, and might communicate by an earthenware pipe with the other reservoir.

In estimates made without plans or sections, considerable latitude must be allowed, and they can at the best form only an approximation, but I have little doubt that the whole of the works could be constructed, including an 8-inch main pipe, which would be larger than is necessary at present, in order to provide for an increased population, and including also proper street-mains, fire-plugs, iron service-pipes, and a tap in every house, constantly supplied with water, for the sum of 3500*l*. This amount, being borrowed on security of the rates would be repaid in equal instalments, with interest at 5 per cent., in 30 years, by a charge not exceeding *one penny per week for each house*.

It would be desirable that the local Board should arrange for the thorough drainage of 140 acres of gathering ground, so that the land may be permanently adapted to such purpose. This ought not to be any burden on the inhabitants, because experience proves that thorough drainage increases the value of land of this quality, so as invariably to pay for the original outlay. The great advantage of thorough drained land as gathering ground for a water supply is, that the water descends almost immediately through the soil, without taking up in chemical solution any of the animal or vegetable matters with which the land has been manured; and, that in passing downward among the roots of the plants, and through the subsoil to the drainage-pipes, it undergoes a process of natural filtration. Water so collected, and afterwards aerated in the reservoirs, and distributed fresh through the pipes, is the best that can be obtained for a town supply, because it is not only free from the animal and vegetable matters already adverted to, but also from earthy and other substances in mechanical suspension; from the mineral impregnations which more or less affect nearly all spring waters; and from the vapid unpleasant taste of water stored in butts or private cisterns.

Improved Drainage. — Without an abundant supply of water, perfect town drainage is impossible; but having obtained that indispensable agent, I now come to consider the best means of removing immediately all refuse, before decomposition liberates the gases which at present exert their destructive influence in nearly every part of the town of Ashby-de-la-Zouch.

After the most careful consideration, I should construct a system of earthenware-pipe drainage, below the cellars and foundations of the buildings, and entirely independent of the brook.

A main pipe of 12 inches, or, at the most, 14 inches diameter, would be carried alongside, or under the brook-course, from the Ivanhoe-road to the glue factory, where it would be reduced to about 10 inches. From this, pipes would proceed along Ivanhoe-road, Kilwardby-street, Market-street, and the other public highways, tapering to 6 inches diameter in the upper parts of the town.

The house and closet drains would also be of earthenware, chiefly of 2 and 3 inches diameter. I do not think there are 20 houses in Ashby that would require a 4-inch drain-pipe.

In many parts of the town, especially between Market-street and Ivanhoe-road, great economy would result from a combined system of back drainage, by means of which the expense of conducting the drain from each separate property, through a long court-yard to the public highway, would be entirely obviated.

All the present privies would be either converted into closets, or provided with soil-pan and drain, supplied with water; and every opening in the streets and buildings would be securely trapped. With these arrangements, and the large quantities of water passing through the drains, all refuse would be effectually removed, and stench from the drains be almost entirely unknown.

Guarding myself as before on account of the absence of any plans or surveys which would enable me to give perfectly accurate estimates, I have calculated as an approximation, that the system of earthenware-pipe drainage would cost, including a *temporary* conveying pipe to the old mill, below the Leicester and Burton Railway, rather less than 3000*l*. This, borrowed on security of the rates would be repaid with interest in 30 years, in the manner already described, by a charge of rather less than a penny per week per house, if distributed equally over the town.

I have drawn out the charges for the water supply and improved drainage in this manner, in order to bring home to the minds of the inhabitants the amounts they would be called upon to pay for improved health, cleanliness, and comfort, but it would be obviously unfair, that the owner or occupant of a small house should pay as much for water and drainage as the inhabitant of a large house; these would be matters of future arrangement by the local Board, and would depend upon the extent of internal fittings, &c. required, all of which would be permanent additions to the property.

Distribution of the Refuse for Agricultural Purposes.—Liquid manures are highly valued at Ashby-de-la-Zouch. I have already stated, that water irrigation is practised to a considerable extent, and have shown the increased value of some meadow land, to which the refuse of the town has been applied occasionally in a very diluted state. I now come to speak of its general and entire application to such purposes. I have provided in the drainage estimates for a *temporary* conveying-pipe to the brook below the Leicester and Burton Railway, when the sewage was not required for agricultural purposes; but I am not sure that even this would be necessary, because I can scarcely conceive a town better situated for the immediate sale of the whole of its sewage manure.

I directed the attention of Mr. Kidger, land-surveyor, who has had great experience, to the fact, that an earthenware pipe might be laid from the town, along the tramway called the Ashby Railway, to the Willesley Canal Basin, about two miles below the Bath meadows; and asked him, if he thought the liquid refuse could be profitably conveyed in barges, and distributed over the lands in the neighbourhood of the canal.

I obtained from him the following evidence in reply:—

"There is plenty of fall; but there would be a cutting of about a quarter of a mile, which would exceed 15 feet deep, where the tramway crosses the turnpike road. I have no doubt that such a scheme is quite practicable, in an engineering point of view; and am sure that, if the storm water be thrown into the brook, as heretofore, there would be an immense demand for the town refuse so delivered, and that it would yield a large annual revenue to the town. The sanitary benefit to the inhabitants would be incalculable. The canal is 32 miles in length, and from the Willesley Basin, as the point you name, to Coventry is about 30 miles. There are no locks, and many embankments. A clause in the Canal Act exempts all manures from dues, so that barge-hire would be the only cost of carriage. The district, over which it would be thus applied, is badly off for ordinary manures, and much of the land is very poor. I have no doubt that the demand would exceed the supply."

Improvement of Brook Course.—I have not included in my estimate the expense of altering and improving the course of the brook, because many considerations present themselves, which would be better dealt with by the local Board than by a stranger. Having provided that all the ordinary flow of rain-water and refuse should be conveyed into an independent deep drain, I might conclude that, under proper regulations, the activity of the Inspector of Nuisances, or other officer acting under the local Board, would prevent its channel

from being again polluted. I have no hesitation, however, in saying, that a great improvement would be effected by arching it from the Ivanhoe-road through the town, and diverting its course, at the same time, near the Green, in the direction marked out on the plan already alluded to. A large quantity of land would also be gained, in the most valuable part of the town by this means; but I am unable to consider fully in a Preliminary Report the negotiations and arrangements which would have to be entered into between the local Board of Health, the lord of the manor, and the owners of adjoining property, all of which arrangements would affect materially the public cost of the work.

Improved Pavements.—I have already adverted to the manner of paving the public highways, and expressed an opinion that a great saving might be effected. Very few of the public footpaths are flagged, owing to the great cost of the materials. I would recommend the use of concrete, made of coal ashes, gravel, and gas tar; this would form a durable and impervious pavement at an average of 1*s.* per square yard, or less than one-sixth the price of flagstones. The court-yards are almost entirely unpaved; some are literally quagmires; and most of them saturated with animal and vegetable refuse, from which unwholesome evaporation is continually being evolved. All these should be paved with similar concrete, which could be laid down sufficiently strong, where there are no carriages, at 9*d.* or 10*d.* per yard.

Assuming that the public highways would even cost as much as they now do, and the paving of the courts to be an additional charge for sanitary purposes, we may allow the large quantity of 48 square yards of concrete to every house. At 10*d.* this would amount to 2*l.*, for which the charge, distributed over 30 years, would be *one halfpenny per week.*

Actual Money saving from Improved Works.—We are now in a condition to compare the existing charges with those which a working-man may expect under an improved state of things. It has been already shown, that the present defective water supply alone cannot be reckoned at less than 5¼*d.* per week; while the proposed works, being constructed on a large and economical scale, will cost only 1*d.* per week for water; with 1*d.* for drainage, and ½*d.* for court paving. If we add another ½*d.* for surface cleansing with the hose and jets of water, there will remain a balance of 2¼*d.* per week in favour of sanitary improvements; irrespective of the improved health and greater happiness; lengthened life, and increased ability to labour; which, after all, should be the chief considerations.

The comparatively small cost of the works is owing to the

application of great principles of economy, the advantages of which it is the object of the General Board of Health to secure to every town; and also, to the favourable position of the locality, which renders unnecessary any steam, or other artificial power, for either water supply, complete drainage, or sewage distribution.

Boundaries of the District.—The objections of Lord Hastings to the whole parish being included in the district have been already named; and I have stated that, on a careful examination, a considerable part of the agricultural land might be omitted without prejudice to the town. On my second visit, I traversed the boundaries of the district having its watershed towards the town, and can safely recommend them for the adoption of the Board, as complying with all the requirements of the Public Health Act. I wrote down a description of them on the spot, as follows:—

Commencing in Kilwardby-street at the south-west corner of Mr. Knight's property, and thence proceeding north-westwardly along the middle of the Burton turnpike-road to the point where the boundary line of the parish of Ashby joins the north-east side of the said turnpike-road; thence eastwardly along the said boundary line of the parish of Ashby to the Old Park, or Moore's Farm, and including the whole of the farm buildings there; thence south-eastwardly along the middle of an ancient driftway, or occupation road, between the Old Park farms, to the Nottingham road; thence south-westwardly along the middle of the Nottingham-road to the brook which crosses it on the west side of Hood's Farm; thence southwardly along the middle of the course of the said brook to its confluence with the brook which divides the parish of Ashby from the parish of Packington; thence southwardly and south-westwardly along the middle of such last-mentioned brook to the point where it receives the Gilwiskaw Brook; thence northwardly and south-westwardly along the boundary line of the parish of Ashby to the Packington Nook-lane; thence northwardly, south-westwardly, and north-westwardly along the boundary line of the parish of Ashby-de-la-Zouch to the turnpike-road leading to Measham; thence north-eastwardly along the middle of the said turnpike-road to the centre of the Tramroad-bridge; thence north-westwardly across the Willesley-road, and along the fence between two fields belonging respectively to Edward Mortimer Green, Esq., and the clerk of the parish of Ashby; thence in a northwardly direction along the westward side of a field, lately purchased by Sir Charles A. Hastings, Bart., of the late Thomas Cantrell, Esq., to the Leicester and Burton Railway; thence in a northwardly direction across the said railway, and along the boundary fence dividing the estate of the said

Sir Charles A. Hastings from the estate of the late Thomas Cantrell, to the Moira-road; thence eastwardly along the middle of the said Moira-road to the point near the south-west corner of Mr. Knight's property aforesaid, where the said boundary line commenced.

Number and Constitution of the Local Board.—I would recommend that the local Board of Health for the district of Ashby-de-la-Zouch should consist of nine members, having the qualification required by the Municipal Reform Act.

### Summary of Conclusions and Recommendations.

The following is a summary of the conclusions and recommendations which it is my duty to lay before the General Board of Health for their consideration:—

1. That endemic diseases and a low state of health are prevalent in all parts of the town of Ashby-de-la-Zouch; that epidemics are so common, that typhus in a low form may almost be said to be endemic; that typhus also frequently assumes a virulent and fatal character; and that the sickness and mortality of all classes and ages is very excessive.

2. That there is a total absence of any public works or arrangements, except such as are calculated rather to injure than to improve the health of the inhabitants.

3. That the health of the population would be greatly improved—

   1. By an abundant supply of water carried into every house in the town.
   2. By a system of drainage of the site of the town; and, also, by the better drainage of the suburban lands.
   3. By preventing in future the Gilwiskaw Brook from being polluted in its passage through the town.
   4. By the abolition of all privies as at present constructed, and the substitution of soil-pan apparatus, with proper drains to convey away the refuse, and by the removal in underground channels of all stagnant pools and accumulations of decomposing refuse.
   5. By improved paving of courts, alleys, streets, and roads, and by improved surface cleansing.

4. That these objects may, in all probability, be accomplished at the following rates per week for each cottage-house:—

   1. A constant supply of water, with a tap in the house, *for one penny.*
   2. A system of complete drainage, with soil-pan apparatus in lieu of the present privy, *at one penny.*

3. Durable and impervious court, and other private paving, *at one halfpenny.*
4. Cleansing of streets and courts by the hose and jets of water, *at one halfpenny.*

5. That the excreta or sewage of the town may be applied with the greatest facility to agricultural lands, with much advantage to such lands, and so as to yield a considerable revenue to the town.

6. That the expense of the whole of the above improvements would be less than the existing cost of the present defective water supply alone.

7. That the application of the Public Health Act would be of incalculable benefit to the town.

8. That the district should be included within the boundaries described at length in the body of this Report, and delineated upon the plan hereunto annexed.

9. That the local Board of Health should consist of nine members, having the qualifications required by the Municipal Reform Act.

I have the honour to be,
My Lords and Gentlemen,
Your most obedient Servant,
WILLIAM LEE,
*Superintending Inspector.*

*The General Board of Health.*
*&c.* *&c.*

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