



PUBLIC HEALTH ACT.

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



R E P O R T

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 BOROUGH OF

BIRMINGHAM.

By **ROBERT RAWLINSON, Esq., C.E.,**

SUPERINTENDING INSPECTOR.



L O N D O N :

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FOR HER MAJESTY'S STATIONERY OFFICE.

1849.

NOTIFICATION.

THE General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that on or before the 20th 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 Borough of BIRMINGHAM, or with respect to any amendment to be proposed therein.

By order of the Board,

HENRY AUSTIN, *Secretary.*

*Gwydyr House, Whitehall,
15th June, 1849.*

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 Borough of Birmingham. By ROBERT RAWLINSON, Civil Engineer, Superintending Inspector.

MY LORDS AND GENTLEMEN,

May, 1849.

OPENING STATEMENT.—More than one-tenth of the rated inhabitants of Birmingham having petitioned for the Public Health Act to be applied to that town, in accordance with your instructions the proper notices were given as the Act prescribes; and I commenced a public inquiry at 10 o'clock in the forenoon on Monday, February 12th, 1849, in the large room belonging to the Birmingham Commissioners, at the public offices, Moor-street. The inquiry was continued throughout the week by receiving evidence, and by personal inspection, and was then adjourned until Monday, 30th April, 1849; but previous to which date the usual notices were again issued, affixed, and advertised, as if the inquiry had not been so adjourned. Evidence was taken in public as on the previous occasion, and the inspection of the town and district was continued throughout the week; and I beg respectfully to submit this as my Report, based on such evidence and such personal examination. The town-clerk tendered formal proof of the notices having been affixed to the doors of the principal churches and chapels of the borough, and of the same notice having been advertised in all the local papers.

The inquiry at its opening was attended by S. Thornton, Esq., mayor; Mr. S. Bray, town-clerk; Mr. William James, high bailiff; Mr. W. Haines, clerk to the Commissioners and solicitor to the Water Works Company; Mr. Alderman Phillips, Mr. Alderman Martineau, Mr. Alderman James, Mr. R. T. Cadbury, Mr. D. Malins, Mr. Cheshire, Mr. J. Pigott Smith, surveyor to the Commissioners, and others. Throughout the whole inquiry every information and assistance was willingly given by all parties, whether officially connected with the present governing bodies in the several districts, or rate-payers and householders only, who attended to give voluntary evidence or point out some local nuisance of which they wished particularly to complain. The following named gentlemen, officially connected

with the district, either attended personally or gave their countenance and support to the inquiry:—

The Rev. J. C. Miller, rector of St. Martin's; the Hon. and Rev. Grantham M. Yorke, rector of St. Philip's; the Rev. John Garbett, rector of St. George's and rural dean; Mr. Joseph Hodgson, surgeon, and Mr. James Russell, surgeon, medical sanitary inspectors; Dr. Evans, Dr. James Johnstone, Dr. Birt Davis, Dr. Wright, Dr. Melsom, Mr. Thomas Chavasse, surgeon; Mr. Wickenden, surgeon; Mr. W. Sands Cox, surgeon; Mr. W. H. Partridge, surgeon; Mr. E. Bartlett, surgeon; Mr. S. A. Bindley, surgeon; Mr. T. Colmore, clerk to the Surveyors of Bordesley; and the several local and district officers, Mr. R. W. Webb, clerk to the Commissioners of Deritend and Bordesley; Mr. W. E. Mayne, surveyor; Mr. R. Dolphin, solicitor, clerk and treasurer to Commissioners of Duddeston and Nechells; Mr. John Heminsley, surveyor; Mr. J. Phillips, surveyor of Deritend; Mr. W. Thomas, and Mr. R. Parry, surveyors of Edgbaston; Mr. Rofe, engineer to the Water Works; Mr. R. A. Stephens, superintendent of police; Mr. E. Pitt, clerk to the Board of Guardians; Mr. J. Bliss, inspector of nuisances: relieving officers, Messrs. White, Gibbs, Rutherford, Edwards, Cairns, and Richards.

Mr. *William Haines* stated—

“ I attend here, sir, as clerk to the Commissioners of the Birmingham Street Act; and I have to say, that they enter most cheerfully into the inquiry, and will be happy to furnish any information in their power.”

This assertion was most amply verified.

I explained the mode in which I proposed to conduct the inquiry: that I would take such evidence as was tendered, and arrange for due personal inspection; that I should be happy to have the company of any of the gentlemen then present during such inspection, and that I also would receive written evidence or information on any matter connected with the inquiry. I explained that, according to my instructions, I could not hear parties through their solicitors or attornies, for the purpose of proving or disproving evidence; but that the examination “ must be mainly one as to works, or as to engineering appliances for the removal of the evils in question:” that it was the wish of the General Board to avoid the “ inutility and grievous expense of former investigations as to the necessary or comparative merits of engineering works, when conducted according to the methods adhered to by Courts of law.” The mayor, the town-clerk, the high bailiff, Mr. Alderman James, Mr. Malins, and several other gentlemen, gave me much of their time and valuable assistance throughout the inquiry and inspection.

* The Corporate Borough is co-extensive with the Parliamentary boundaries.

Birmingham, a parish, market-town, and borough, is one of the most extensive manufacturing towns in England. It is situated near the centre of England, in the hundred of Hemlingford, in the north-west extremity of the county of Warwick, and on the borders of the counties of Stafford and Worcester; in $52^{\circ} 29'$ north latitude, $1^{\circ} 55'$ west longitude, 82 miles S. by E. from Manchester, 104 miles S.E. by S. from Liverpool, and 109 miles N.W. from London on the Holyhead-road; difference in time $7\frac{1}{2}$ minutes later than London. Under the new representation Act the borough returns two members to Parliament. The parishes of Birmingham and Edgbaston, and the townships of Deritend and Bordesley, and Duddeston-cum-Nechells, are included within the elective boundary of the borough. The area within the Parliamentary borough boundaries is 8,780 acres. Population, in 1841, 182,922.

EARLY HISTORY.—The early history of Birmingham as a town or village is traced back, by Hutton, beyond even the Saxon date; and he gives a chapter of quaint and ingenious reading, if not very clear and convincing argument, to prove that, because the Britons used spear, sword, and war-chariots, armed with scythes, against the first Roman invaders, that therefore these implements must have been of British manufacture, and he says—

“There is the utmost reason to believe our forefathers, the Britons, were supplied with those necessary implements by the black artists of the Birmingham forge. Iron-stone and coal are the materials for this production, both of which are found in the neighbourhood in great plenty.” . . . “The minute sprig of Birmingham no doubt first took root in this black soil, and in a succession of ages has grown to its present opulence.” . . . “At what time this prosperous plant was set is very uncertain, perhaps as long before the days of Cæsar as it is since.”

Dugdale mentions Birmingham, and Leland described it in his Itinerary in the reign of Henry the Eighth:—

“I came through a pretty street as ever I entered, into Birmingham town. I saw but one parish-church in the town.”

“There be many smithes in the town that use to make knives and all manner of cutting tools, and many loriners that make bittes, and a great many naylers; so that a great part of the town is maintained by smithes, who have their iron and sea-coal out of Staffordshire.”

The “*sea-coal*” was no doubt brought from the mines direct on the backs of horses in panniers.

In sketching the rapid increase of Birmingham I purpose to point out how necessary it has become to look well forward from this time to the true benefit and health of the inhabitants; that the conflicting governments of municipally-combined parishes, now joined into one great town, may be consolidated and made one; that the future extension of the town may be fully provided for in all matters of drainage and convenient

arrangements for streets; and that past mistakes may, where practicable, be rectified. The ancient centre of Birmingham seems to have been the Old Cross, from the number of streets pointing towards it. These streets were in the first instance set out narrow. Mr. Hutton says, "One generation, for want of foresight, forms a narrow entrance, and another widens it by Act of Parliament." He also gives in one view "the state of Birmingham at different periods;" and says, "though some are imaginary, perhaps they are not far from real."

		Streets.	Houses.	Inhabitants.
In the time of the Ancient Britons . . . . .		..	80	400
A. D.	750	8	620	3,000
	1066	9	700	3,500
	1650	15	900	5,472
	1700	28	2,504	15,032
	1731	51	3,717	23,286
	1741	54	4,114	26,660
	1781	125	8,332	50,295
	1791	203	12,681	73,653
	1816 . . . . .	..	17,710	88,550
	1818 . . . . .	..	18,000	90,000

The present number of houses in Birmingham is about 27,600, and the number of inhabitants 138,210; but in the combined parishes the numbers are 43,000 houses, and 220,000 inhabitants.

With the existing portion of the town sanitary measures must be applied as fully as circumstances will admit; the two thousand courts cannot all be opened out or be abolished, as there are 50,000 inhabitants congregated in them, but very much may be done to remove the cause of disease by a proper and complete system of drains and a full and constant water supply, and there is the future, over which a wise control may be exercised.

GEOLOGICAL CHARACTER OF DISTRICT.—The town of Birmingham stands upon the new red sandstone, the outcrop of the same formation, passing in a great curve from the river Tees, southward to Birmingham, and round westward and northward to the Mersey. On this great sweep of sandstone are built the important towns of Sunderland, York, Derby, Leicester, Birmingham, Warwick, Worcester, Wolverhampton, Shrewsbury, Stafford, Chester, Liverpool, Manchester, and Stockport, and many towns of less note. In the regular order of geological stratification, the new red sandstone overlays the coal measures, which "crop out," or rise to the surface, along the inner margin of this great bend. The sandstone is again overlaid by the lias and oolites, which form its outer margin.

to the east. The present surface of the whole district is undulating, and bears evidence of the former moulding and shaping action of water. The new red sandstone, which is several hundred yards in vertical thickness, has been originally deposited in the bed of a former sea, and the ripple markings found throughout the greater portion of its depth show hundreds of distinct lines of beach, on which the sun shone, the rain pattered, and uncouth reptiles of a past creation walked to and from those ocean waters. These facts are amply testified to in the quarries of Cheshire, at Storton, Weston Point, and Lymm, where, countless ages since, the sun-cracks and rain-drops stereotyped their forms on the yielding clay deposited by the previous tide, to be more enduring than iron or brass; and the reptile foot-prints have left characters far more stable than aught, the work of man. Could we have seen the form of county when the diluvium on which Birmingham now stands was being deposited, we should have found the sea-shore forming a boundary probably not unlike the curve of the outcropping lias. The Alps were yet below the salt wave, although the Grampians of Scotland had existed countless centuries, and the hills of Cumberland had passed their state as glaciated mountains. Wales was dry land, and the Cotteswold Hills, in Gloucestershire, and some few parts of central England, were above water. The rocks of Dudley had subsided even before the deposit of the sand-rock began; huge ice-floes and bergs came floating up from some northern continent long since drowned, grinding the imbedded fragments torn from their parent rock, wearing banks and shoals, and ultimately depositing their stony burden in scattered groups over vast areas hereafter to become dry land. The whole site on which Birmingham stands has been subjected to this wearing action, and the present valleys of the rivers Rea and Tame are but the indentations of an old sea-shore; the sand and gravel now dug from beneath the streets was washed and rolled by comparatively shallow water into its present bed; the alternations of clay and marl speak of deeper water, or a more quiet shore. In a section along the bed of the Rea we find, at its junction with the Tame, soil 2 feet, sand and gravel 20 feet, black peat 4 feet, clay 3 feet, and sand and gravel repeated. This peat indicates land at or near the level of the sea. Near Balsall Heath Road, at a higher level, we find soil 2 feet, peat 3 feet. This is a formation distinct from that previously named, and about 30 feet above it, with gravel and sand 12 feet, clay 4 feet, and 14 feet of marl betwixt. On either side the valley of the Tame we find, first, soil 2 feet, sand and gravel 15 feet, clay 5 feet, resting on sand and gravel; then soil, sand, and gravel 10 feet, and clay 25 feet; and, at another point on the south side, sand and gravel 32 feet, clay 27 feet, gravel mixed with

clay 4 feet, resting on running sand; near St. Philip's and St. Paul's churches the sand and gravel is only from 9 to 17 feet deep down to the red sandstone rock. The site of St. Philip's Church is a portion of the highest land in the town; the junction of Anne-street and Newhall-street, Regent's-street and Frederick-street, are on the same level; the water-works' reservoir is on land 60 feet above these points. The junction of the rivers Rea and Tame is 168 feet below the site of St. Philip's Church.

The undulating surface of the land renders the town clean; ventilation is more freely obtained; the surface of the streets are preserved comparatively dry by their general inclination; and the sand and gravel tends to preserve the foundations of the buildings dry.

METEOROLOGICAL OBSERVATIONS, partially abstracted from the published Records of the Birmingham Philosophical Institution.

Annual Quantity of Rain-fall in Birmingham.

1837	rain fell	27·241	inches	} 26·073 inches average, being 6 inches more than for the year 1844.
1838	, ,	23·140	, ,	
1839	, ,	29·612	, ,	
1840	, ,	21·440	, ,	
1841	, ,	30·395	, ,	
1842	, ,	23·765	, ,	
1843	, ,	26·716	, ,	
1844	, ,	20·101	, ,	

The rain-fall of 1841 exceeded that of 1844 by 10,294 inches, being one-third the amount of the year 1841, and one-half the amount of 1844.

Number of Days on which Rain or Snow fell in Birmingham.

1842.	Rain or snow fell on	178	days	} Mean, 181·666 days.
1843.	, ,	204	, ,	
1844.	, ,	163	, ,	
1842.	November, in 22 days	4·500	in. of rain fell, being the greatest amount during that year in one month.	
1842.	April, in 6 days	·555	in. of rain fell, being the least amount during that year in one month.	
				3·945 inches difference of fall.
1843.	October, in 25 days	4·140	in. of rain fell, being the greatest amount during that year in one month.	
1843.	December, in 10 days	·240	in. of rain fell, being the least amount during that year in one month.	
				3·900 inches difference of fall.

1844. February, in 17 days 3·086 in. of rain fell, being the greatest amount during the year in one month.
1844. May, in 7 days .245 in. of rain fell, being the least amount during that year in one month.
-
- 2·841 inches difference of fall.
-

The respective observations were registered at nine o'clock each morning, the pluviometer indicating a deposition of rain, snow, or hail from the .005 of an inch upwards. The amount of evaporation was measured by Mr. Luke Howard's evaporation gauge.

	Feet.
Height of the cistern of barometer above the ground	13
Ditto above presumed mean level of the sea . . .	462
External thermometers above the ground . . .	42
Receiver of rain gauge above the ground . . .	38
Evaporation gauge above the ground	37

In the month of July, 1845, on the evening of Sunday the 6th, 1·945 inches of rain fell in little more than half an hour, a larger amount than had ever been previously registered in 24 hours. This fall of rain was equal to 9·091 gallons upon each square yard, or 44,000·440 gallons to each acre.

Barometric Observations at Birmingham.

Year.	Greatest Elevation.	Lowest.	Difference.	Mean.
	Inches.	Inches.	Inches.	Inches.
1842	30·172	28·370	1·802	29·271
1843	30·224	27·638	2·586	29·496
1844	30·154	28·246	1·908	29·511

The depression of the barometer in 1843, when it stood at 27·638 inches, took place at 30 minutes past 11 P.M. of January 13th, and is the lowest ever registered in Birmingham. It was accompanied by a violent storm, which lasted more than two days. Within six days the barometric column varied 2·494 inches, an amount never before recorded in Birmingham, probably not in England.

Temperature at Birmingham.

- 1842 { Aug. 18. In the shade—highest 86·5° } Difference 65·0°.
 { Jan. 24. , , lowest 21·5° }
 Mean temperature of the whole year . 48·74°.
- 1843 { Aug. 18. In the shade—highest 82·5° } Difference 64·0°.
 { Feb. 15 & 16. , , lowest 18·5° }
 Mean temperature of the whole year . 48·82°.
- 1844 { July 24. } In the shade—highest 85·0° } Difference 65·0°.
 { Sept. 18. } , , lowest 20·0° }
 { Dec. 8. }
 Mean temperature of the whole year . 48·51°.

Annual Quantity of Evaporation at Birmingham.

1843.	Evaporation	32·166 inches,	exceeds rain-fall	5·450 inches.
1844.		35·113	„ „	15·012 „
	Difference in the two years :			9·562 „

It will be seen from this table that a minimum fall of rain is accompanied in the same year with a maximum evaporation, amounting, in 1844, to 9·562 inches over the previous year; or, the excess of evaporation in 1843 is one-fifth of the rain-fall, nearly; but the excess in 1844 is three-fourths of the rain-fall of that year.

The greatest Force of the Wind registered in Birmingham.

1842.	Jan. 26.	23 lbs. on the square foot,	direction south-west.
1843.	Feb. 4.	20 lbs. „ „ „	north-east.
1844.	Mar. 12.	16 lbs. „ „ „	west.

The velocity of the wind, when 23 lbs. on the square foot, is about 70 miles in the hour, and amounts to a hurricane. At 16 lbs. pressure, the velocity is nearly 60 miles in the hour, which is that of a great storm. These storms stripped the lead partially from the roof of the town hall, and did other serious damage in the town.

Table of the Fall of Rain at various Places.

Year.	Birmingham.	Liverpool.	Manchester.	Belmont Reservoir, near Bolton, Lancashire.	Bury, in Lancashire.	Remarks.
	Inches.	Inches.	Inches.	Inches.	Inches.	
1840	21·440	37·68	38·44	..	41·83	
1841	30·395	49·55	41·24	..	47·37	
1842	23·765	34·67	31·55	..	37·49	
1843	26·716	36·55	40·15	63·40	40·47	The average of Belmont is as seen only for two years.
1844	20·101	30·10	26·55	50·60	27·65	
	24·483	37·710	35·586	57·000	38·962	Average of these five years. Deduct the average at Birmingham.
	..	24·483	24·483	23·408	24·483	
	..	13·227	11·103	33·592	14·479	Excess over Birmingham in each place.

It will be seen from this table that the average fall of rain in Birmingham is about one-third less than in Liverpool, Manchester, and Bury, in Lancashire, and for the two years of 1843 and 1844, about three-fifths less than at the Belmont reservoir, near Bolton.

This difference in the amount of rain-fall, or damp in the atmosphere of Warwickshire and Lancashire, is worthy of particular notice, as it must have a sensible effect on the manufactures of the district, as also on the health of the inhabitants. It is said, the damp atmosphere of Lancashire is

necessary to the profitable spinning of cotton-yarn, and certainly the dryer atmosphere of Warwickshire is equally advantageous to the iron manufacture; to the production of polished steel implements, and the metal-plated wares in general of Birmingham. The elevated and comparatively dry site of the town and dry atmosphere of the district, no doubt contributes to that favourable difference in the health of the people, which is known to exist, as contrasted with Liverpool and Manchester; but there is, nevertheless, much to improve even in Birmingham.

Although the mean results of the fall of rain show a comparatively dry atmosphere for the whole year, yet it must be observed, that at times there is an excessive rain-fall, as in October, 1843, continuous throughout 25 days of the month, and in July, 1845, when nearly two inches fell within one hour. Birmingham will reap a double advantage from proper drainage; as the same means taken to improve the health and comfort of the inhabitants, by removing excess of moisture and putrid exhalations from the surface of the district, will also be highly advantageous to their manufactures; a purer and dryer atmosphere insured at all times will further tend to preserve all their polished metal productions.

The heavy rain-fall in July, 1845, flooded all the lower parts of the town, particularly in Digbeth, Dudley-street, Smallbrook-street, Pinfold-street, and other places. In Dudley-street, the water rose to the height of three feet, and all the cellars in the low districts were filled, much pecuniary damage was suffered by the inhabitants.

BOROUGH OF BIRMINGHAM AND ITS BOUNDARIES. — The borough is bounded on the north by the parishes of Handsworth and Aston down to Phillips's Mill, at this point it enters the parish of Aston, including the hamlets of Duddeston and Nechells. Deritend and Bordesley, all in the parish of Aston, and limiting its extent to the north and south-east; it includes the whole of the parish of Edgbaston to the south and south-west; to the west it is co-extensive with the parish of Birmingham, the whole of which it includes, the same being bounded by the parishes of Harborne and Smethwick.

Its extreme length is $5\frac{1}{4}$ miles, average breadth 3 miles; it is 21 miles in circumference, and contains 8,420 acres, has 100 miles of streets, and 40 miles of suburban road; it has an average rising gradient of 1 in 108 from east to west, being a rise of 250 feet, from the point near the river Tame, (where the whole of its sewage will be concentrated), to the highest table of land to the west; it arises from the south to the north-west, (*i. e.*, from Vaughton's Bridge to the gaol,) 122 feet, a gradient of 1 in 121.

MARKETS.—Monday, Thursday, and Saturday, are the market-days. An excellently arranged and spacious market-hall, with extensive storing-vaults beneath, has recently been erected. It is 365 feet in length and 108 wide. Fairs are held on the Thursday and two following days in Whitsun-week, and on Thursday and the two following days nearest to the 29th of September.

Horses and horned cattle are sold on Thursday in a spacious area to the south-west of the town, called Smithfield. At these fairs considerable business is done in cattle, horses, and agricultural produce generally. At the Michaelmas fair such immense quantities of onions are exposed for sale as to give a name to the fair; that of Whitsuntide is most celebrated for its toys and shows.

GOVERNMENT.—The borough of Birmingham is composed of the parishes of Birmingham and Edgbaston, and the hamlets of Deritend and Bordesley, and Duddeston-cum-Nechells, in the parish of Aston, in the county of Warwick.

The borough is divided into thirteen wards, of which the parish of Birmingham forms ten, the parish of Edgbaston, and the townships of Deritend and Bordesley, and of Duddeston and Nechells, each one. For the entire borough, sixteen aldermen are elected; of these, one each is appointed by the councillors to represent each of the thirteen wards, and the other three aldermen act in case of any of the representatives for the wards being absent, three councillors are elected for ten wards, and six each for the other three wards; making a total of forty-eight councillors. The ten wards of Birmingham, with the population of each, are, Lady Wood, 8,787; All Saint's, 13,719; Hampton, 11,037; St. George, 19,648; St. Mary, 14,682; St. Paul, 8,973; Market Hall, 13,014; St. Peter, 16,773; St. Martin, 13,323; and St. Thomas, 18,254: or 138,210 in the ten wards.

POLICE FORCE consists of one chief superintendent, Mr. Stephens, five inspectors, six sub-inspectors, 22 serjeants, and 282 constables.

The following is a list of the various independent local Boards, exercising jurisdiction within the borough; and I agree with Hutton, the historian of Birmingham, who remarks, "a town governed by a multitude of governors, is the most likely to be ill governed."

LIST of the various LOCAL BOARDS exercising jurisdiction within the Borough of Birmingham for Paving, Lighting, Cleansing, Municipal and Sanitary Purposes, with the names of their respective Clerks, Surveyors, and other Officers, and the dates of the Statutes and Charter under which they derive authority.

Birmingham Commissioners.

9th Geo. IV., c. 94, 1828.—An Act for better paving, lighting, watching, cleansing, and otherwise improving the town of Birmingham, in the county of Warwick, and for regulating the police and markets of the said town.

Clerks.—Messrs. Haines and Arnold, solicitors.

Surveyor.—Mr. J. Pigott Smith.

Treasurers.—“The Birmingham Banking Company,” Town Hall Fund; Messrs. Taylor and Lloyds, General Fund; Messrs. Moilliet and Co., Highway Fund.

Accountant Clerk.—Mr. Charles Fiddian.

Deritend and Bordesley Commissioners.

31st Geo. III., 1791.—An Act for cleansing, lighting, watching, and levelling the surfaces of the streets and other places within the hamlets of Deritend and Bordesley, in the county of Warwick, and for removing and preventing nuisances, obstructions, and encroachments, and regulating the driving of carts and other carriages used for carrying goods, wares, and merchandises therein.

Clerk.—Robert W. Webb, solicitor.

Surveyor.—Mr. William Edwin Maync.

Treasurer.—William Tonks.

Duddeston and Nechells Commission.

8th and 9th Vic., c. , 1845.—An Act for lighting, draining, cleansing, and improving the hamlets or liberties of Duddeston and Nechells, in the parish of Aston, near Birmingham, in the county of Warwick.

Clerk, Treasurer, and Solicitor.—Mr. Robert Dolphin.

Surveyor.—John Heminsley.

Guardians of the Poor.

1831.—An Act for better regulating the poor within the parish of Birmingham, in the county of Warwick, and for empowering the Guardians of the poor to grant building leases of certain lands vested in them, or otherwise to sell and dispose of the same, and to apply the monies to arise therefrom in the enlargement or rebuilding of the present workhouse, and for other purposes.

Clerk.—Mr. Edward Pitt.

Municipal Corporation.

October 31, 1838.—Charter of Incorporation granted by Her present Majesty Queen Victoria.

Town Clerk.—Mr. S. Bray.

Treasurer.—Mr. H. Knight.

Medical Sanitary Inspectors.—Mr. Joseph Hodgson and Mr. James Russell.

Inspector of Nuisances.—Mr. James Bliss.

Deritend Surveyors of Highways.

General Highway Act. *Clerk.*—Mr. W. P. Allcock, solicitor.
Surveyor.—Mr. James Phillips.

Bordesley Surveyors.

General Highway Act. *Clerk.*—Mr. Thomas Colmore, solicitor.
Surveyor.—Mr. William Edwin Mayne.

Edgbaston Surveyors.

General Highway Act. *Surveyors.*—Mr. Richard Parry, and Mr. William Thomas. These appoint Mr. Foxall to act for them.

It will be seen from this list that there are eight distinct and separate governing powers within the Parliamentary borough of Birmingham, and, consequently, eight separate sets of officers have to be paid to do the work which may be done by one efficient staff. This however is not the only feature in the case, as payment, even extravagantly high for services rendered, would afford some ground for encouragement, but in the present instance, as will be shown in the evidence, the establishments act in opposition to each other. The Commissioners of Birmingham expend large sums of money to keep the sewage of the town out of the river Rea, and the surveyors of Edgbaston make a sewer to turn their refuse into that river. There is no general plan of the district, and though nature has combined the whole so as to render one set of sewers imperative, there is no power to levy a common rate, although the benefits must be general. However willing all may be to act in concert for the common good, their present Acts imperatively forbid, or lack the necessary powers to sanction such a measure. The Commissioners of Birmingham have made sewers, but have no power to construct private drains, or to compel parties to construct them, although large sums of money have to be expended to remove and cleanse accumulations of foul, dangerous, and highly offensive matters, which might more cheaply be passed into their sewers.

Many ineffectual attempts have been made to consolidate the power necessary to the cheap and efficient government of the borough, and much money has been expended in opposition to one Bill or another. It was stated that at least 30,000*l.* had been so expended; and I may refer to the great meeting which took place in May, 1845, to "consider the propriety of amalgamating the various local bodies in the borough," to prove the anxiety which then existed on this subject; and in the same year a private Bill was taken into Parliament by the Commissioners of Duddeston and Nechells, which was opposed by the Corporation of Birmingham, on the ground that one general measure was most desirable; that Bill was however

passed into a law and is now in force. It is not too much to say that the inhabitants of the borough of Birmingham have paid for private Bills, and for opposition to them, more than 100,000*l.*, within the last 50 years; and at present they pay large sums each year in excess for their divided management.

LIST OF RATES WITHIN THE BOROUGH OF BIRMINGHAM.—Birmingham poor-rate during one year ending Lady-day, 1849, 5*s.* in the *£.*, 81,871*l.* 3*s.* 1*d.*

Birmingham Street Commissioners Rates.—Highway rate, 1*s.* 6*d.* in the *£.* Lamp rate, 1*s.* 3*d.* on 15*l.* and upwards; 10*d.* on 10*l.* and under; 7½*d.* above 5*l.* and under 10*l.* Town Hall rate 4*d.* in the *£.* on all assessments of 15*l.* and upwards.

Aston within the Borough—Deritend and Bordesley Commissioners Rate.—Assessment under 6*l.* are rated at 6*d.* in the *£.*; 6*l.* and under 10*l.* at 9*d.*; 10*l.* and under 15*l.* at 1*s.*; 15*l.* and under 20*l.* 1*s.* 3*d.*; 20*l.* and all above, at 1*s.* 6*d.* The Bordesley Surveyors levy annually a rate of 5*d.* in the *£.* The Deritend Surveyors levy annually a rate of 6*d.* in the *£.*

Duddeston and Nechells Commissioners Rate.—Two rates are levied annually 9*d.* in the *£.* each, together with 1*s.* 6*d.* in the *£.*

The poor rate for the whole parish of Aston, is 10*d.* in the *£.*

N.B. Aston has the benefit of belonging to a Union, which has very much reduced the poor-rate. The borough rate in that part of Aston parish, within the borough, is made and levied by overseers appointed for that express purpose by the Council. Birmingham and Edgbaston being wholly situated within the borough, pay the borough rates out of the poor-rates.

In 1848, two borough or district rates were made in that portion of Aston within the borough, one at 10*d.* and one at 11*d.* in the *£.*, together 1*s.* 9*d.* in the *£.*

Edgbaston.—Poor-rate, 1*s.* 10*d.* in the *£.* Highway-rate, 9*d.* in the *£.* Lighting-rate for part of the parish (Hagley-road) 6*d.* in the *£.*

N.B. The borough-rate is 1*s.* in the *£.* per annum. In Aston the borough-rate is higher in consequence of not being collected with the poor-rate.

The assessment of the borough of Birmingham, according to the last return of the overseers to the Council is as follows:—

	£.	s.	d.
Birmingham	462,025	1	7
Edgbaston	46,341	3	6
Aston (within the Borough)	106,846	7	2
Total in 1849	£615,212	12	3*

* COPY of a LETTER from the BOROUGH TREASURER, Birmingham.

"DEAR SIR,

Birmingham, May 7, 1849.

"S. THORNTON, Esq., our mayor, has requested me to forward to you a statement of the annual value of the property of the borough as assessed to our borough rates.

"The statement I annex, is according to a return made by the respective overseers in June, 1847; viz.—

	£.	s.	d.
Birmingham, (the entire parish)	441,142	3	6
Edgbaston, ditto	43,136	0	0
Aston (the hamlets of Deritend and Bordesley, and the hamlet of Duddeston-cum-Nechells)	98,683	10	3
Total in 1847	£582,961	13	9*

The amount levied as borough-rate during the past year, was at the rate of 1s. in the pound, by four quarterly rates of 3d. each, and I have announced to the Council that the same rate will be necessary for the now current year. An inconvenience arises with respect to the rate on the hamlets of Deritend and Bordesley, and Duddeston-cum-Nechells, *parts of the parish of Aston*, but within the borough of Birmingham. An Act was passed in 1835, (9 and 10 Vict., c. 110,) 'For the better collection of Borough and Watch Rates in certain places.' It refers to places lying partly within, and partly without the borough, as is the case of the parish of Aston. It directs the appointment, &c., of district overseers for making and collecting borough rates, in such parts only of the parish as are within the boundary of the borough, but by one clause (the 4th) it *authorizes the district overseers to make their rate at such an amount in the pound as may be necessary for raising the sum charged by the Council*; but it very strangely adds, so that *no such district rate shall exceed 2d. in the pound beyond the rate in the pound at which the general borough is rated*; such contradictory legislation, (as is the case here) must frequently be found very inconvenient. Our borough rate is paid by the parishes of Birmingham and Edgbaston, in full, without any consideration of the rate in the pound necessary to be assessed by the overseers, to enable them to realize the amount; but an addition of 2d. in the pound to the general rate of 1s. or one rate in the year, in the Aston portion of the borough would not realize the sum required. I have been led, therefore, on this Act coming into operation, to induce the Council to make our rates *quarterly*, being thus enabled to take the sting out of the Act, and obtaining *four times 2d.* in the pound additional from the Aston hamlets. This occasions quarterly rates, and the frequent calls produces its effects,—the rates are always in arrear. I have troubled you with these remarks, with some faint hope that this inconvenience from the strange inconsistency of legislation, may find a remedy in some corner of a 'provisional order.'

(Signed) "HENRY KNIGHT,
"Borough Treasurer."

* The poor rate assessment has increased in two years by a sum of 32,250l. 18s. 6d. in the borough.

LIST of PAID OFFICERS within the Borough of BIRMINGHAM.

	Solicitors.	Surveyors.	Collectors.	Clerks and Treasurers.	Total Number of Officers.
<i>Solicitors.</i>					
The Commissioners of Birmingham	9	..	..	..	..
„ „ Duddeston and Nechells					
„ „ Deritend and Bordesley					
The Surveyors of Highways of Bordesley					
„ „ Deritend					
„ „ Edgbaston					
The Guardians of the Poor					
The Overseers of the Parish of Aston					
The Town Clerk					
<i>Surveyors.</i>					
The Commissioners of Birmingham . . . . .	..	4	..	..	..
„ „ Duddeston and Nechells					
„ „ Deritend and Bordesley					
The Surveyors of Highways of Edgbaston					
The Commissioners of Birmingham have a Clerk to the Markets, with a staff under him; an Accountant, with an Assistant Clerk; and there is the Treasurer to the Corporation					
There are three Collectors of Poor's Rates within the parliamentary borough: one for Birmingham, one for Edgbaston, and one for Aston					
There are three Collectors under the Birmingham Street Commissioners: one for Highways, Lamp and Scavengers, one for the Town Hall Rate, and one for collecting the Highway Rate					
The Commissioners of Duddeston and Nechells have a Collector; the Commissioners of Deritend and Bordesley have also another Collector; the Surveyors of Highways of Deritend have a Collector; there is also a Collector for a Highway Rate for Bordesley; and a Collector of the Highway Rate for Edgbaston			5	..	..
The Council appoint two Overseers to collect the Borough Rate in that part of the Parish of Aston within the Borough of Birmingham: one for Deritend and Bordesley, and one for Duddeston and Nechells; the Council also appoint a High Constable to levy and receive these rates from the two Collectors			3	..	..
There are 12 Collectors under the Street Commissioners of Birmingham			12	..	..
There are probably about 12 Collectors of Poor's Rates; some of these rates are collected on a per centage			12	..	..
	9	4	38	4	55
<i>Water-works and Gas-works Establishment.</i>					
Solicitor to Water-works	1	..	..	..	..
Engineer to Water-works . . . . .	..	1	..	..	..
Clerk and Treasurer . . . . .	..	..	..	1	..
Collectors, say . . . . .	..	..	5	..	..

List of Paid Officers, &c.—*continued.*

	Solicitors.	Surveyors.	Collectors.	Clerks and Treasurers.	Total Number of Officers.
<i>Water-works and Gas-works Establishment—continued.</i>					
Solicitors to two Gas-works	2	..	..	..	..
Engineers to ditto . . . . .	..	2	..	..	..
Clerk and Treasurer to ditto . . . . .	..	..	..	2	..
Collectors, say . . . . .	..	..	10	..	..
	3	3	15	3	24
					79

NOTE.—There are 12 Solicitors, 7 Surveyors, 53 Collectors, 7 Clerks and Treasurers, in all 79 paid Officers. The Solicitors acting for the several Boards have nominal salaries, but also charge professionally, excepting the Town Clerk, who alone is paid at a salary in full. The Commissioners' paving charges are collected on a per centage.

Extract from Sanitary Report of 1842 on the necessity of combined power and superintendence in all sanitary works.

“ A competent, scientific, and efficient management, let it be applied to what works it may, can scarcely fail to be immediately as well as ultimately the most economical management. But it will be found on examination that the consolidation of all the structural arrangements, comprising under-drainage and surface-drainage, road structure and repair, under one service, is most required for the sake of economy. Division of labour in the arts derives its efficiency from combination, adaptation, and subordination to direction to one end; but that which appears to be a division of labour in local administration is, in fact, an insubordinate separation, weakening the means of procuring adequate skill and power, occasioning obstructions and defective execution, and enhancing expensc. Were pins or machines made as sewers and roads are at present constructed, shafts of pins would be made without reference to heads; in machines, screws would be made without sockets, and it may be confidently stated there would be no safe or perfect and well-working machine in Birmingham.”

Divided management has many disadvantages besides those of conflicting and opposing powers, and the great expense necessarily attendant upon a numerous staff of paid officers. There is the confusion and irritation consequent upon the collection of numerous rates. The following apt remarks on this subject are partially quoted from the Sanitary Report of 1842

“ Besides the evil inherent in a multiplicity of districts, and the clashing of interests which hinders the application of science, by preventing the appointment of competent officers, there are other evils attendant on such small jurisdictions, namely, in the mode in which

the money for such expenditure is levied. The popular jealousy is excited and irritated by the number of unnecessary offices and officers, and the annoyance of so many collectors. Where there are a variety of rates collected at different periods, without concert, some are forgotten at the proper period, and not provided for; and when demanded in rapid succession, they fall with inconvenience, and create the irritation of a new tax. The householder may have just paid the collector of his poor's rates, when the collector of his highway rate calls, and immediately after, the collector of the lamp and scavenger rate, then the collector of the gas rate calls next morning, and the collector of his water rate looks in during the day, and is paid, when with good right he may now think he has done; but no, another collector calls to demand the payment of the town-hall rate; he pays him in a pet, when up turns another collector, and demands the payment of some other rate for the period of a former tenant, and for which he, the present tenant, on whom the demand is levied, receives no apparent advantage. This fairly breaks down his temper; and all rates, taxes, collectors, and improvements, are denounced in the bitterness of confused agony and despair."

This, I have been informed, is the case with many of the rate-payers in Birmingham. At present there are about 13 distinct rates.

The following remarks on a "compounding clause" embody the opinions of some of the most influential men in the town; but the town-clerk suggested that the provisions of the Act on this head are clear, distinct, and sufficient.

COMPOUNDING CLAUSE.—A compounding clause is found to work well for all parties, returning a good income with the least cost, benefiting the man of property, and also the poor man. Under a compounding clause all parties should pay whether the tenancies are full or empty. The landlords ought to pay up to 10*l.* or any sum which shall be uniform. Under 5*l.* two-thirds off; from 5*l.* to 7*l.* 10*s.* one-half off; and from 7*l.* 10*s.*, one-third off; assuming 10*l.* to be the limit. The poor's-rate assessment should be the standard and test for all rates. In carrying out the new works, all should pay a just and fair proportion of the rate, unless the house-owners will voluntarily bear the cost of work to be done on property equally in need of improvement. The General Board will not sanction the smallest outlay, unless absolutely required, and such as will not add to the value of the property so improved; the capital required may be borrowed on the security of the rates, and to make these as light as possible, they should be general.

MORTALITY.—The mortality in Birmingham was in 1847, 26½ in 1,000, and in 1848, the rate of deaths was much higher, being increased to upwards of 30 in 1,000, but Birmingham contrasts favourably with most large towns, such as Liverpool

and Manchester. Its elevated site, and comparatively dry atmosphere, must necessarily have a favourable influence over the health of the population. But infant mortality is very considerable. The list of places where epidemic, endemic, and contagious diseases prevail, is, however, numerous, and the evidence of the medical gentlemen is clear and distinct as to the cause of this amount of disease. In 1832, the town was lightly visited with cholera; but in 1665, the plague made dreadful havoc amongst the inhabitants; the churchyard was insufficient for the reception of the dead, who were conveyed to Ladywood Green, where an acre of land was appropriated for their burial, thence called the "Pest Ground." In 1665, the whole town lay in the valley, the chief street being Digbeth, and consequently the situation was low and watery, hence probably the great mortality which then took place. How many lives have fallen a sacrifice to this cause since that period, it would be impossible to calculate, but the lesson taught is plain, namely, that a dry situation is favourable to health, and it may be confidently anticipated, that perfect drainage will add materially to the health of the inhabitants, and generally tend to prolong life.

Excess of Mortality in Birmingham above Meriden, Solihull, and Alcester, based on the census of 1841.

The amount of sickness and mortality shown to exist in Birmingham, and the consequent pecuniary expense incurred, would be most materially diminished by perfect drainage and other sanitary measures. The proportion of deaths in Meriden is 1 in 56, in Birmingham, 1 in 38; the average age of all who have died in each district—Meriden 37 years and 10 months; Birmingham 23 years and 9 months: proportion per cent. under one year of age—Meriden 18·6; Birmingham 24·8: excess in number of all deaths in Birmingham 1217; of adults 112: loss of life to every individual in Birmingham 14 years 1 month. For every adult, 8 years 10 months. Total loss of money value of productive labour at an average of 7s. 6d. per week to each adult individual, 173*l.* Total loss on the year's deaths—sickness 34,076*l.*; funerals at 5*l.* each 6,085*l.*; labour 271,610*l.*: making a total loss of 311,771*l.*

Districts.

Total number of adults prematurely dying .	Birmingham 1,002, Meriden, &c. 177	or to every 10,000 of the population	73 43
Number of all classes killed by epidemic, endemic, and con- tagious diseases .	Birmingham 683 Meriden, &c. 75		50 19
Deaths of all classes from diseases of the respiratory organs .	Birmingham 1,235 Meriden, &c. 194		90 48

	Birmingham District.	Meriden, &c., District.
Proportion of deaths to the population of 1841*	1839	1 in 38
	1840	1 in 37
	841	1 in 38

A LIST of PLACES within the Parish of Birmingham, where Epidemic, Endemic, and Contagious Diseases have of late been frequent, or where from their present condition, in the opinion of the District Medical Officers of the Parish, such consequences may occur.

District A.—Dr. HINDS.

In Sheepcote-court, No. 3, five or six cases of typhus in August last (1848), several deaths, many cases of mild continued fever at that time and since. Cottage-lane, Court 1. Cases of small-pox and varicella.

Mild, continued, and sometimes typhus fevers regularly and frequently infest the following parts, alternating or mixing with scarlet fever, rubeola, and dysentery. Steward-street, Spring-hill (the whole), Eyre-street, Edmund-street (especially Courts 9 and 4), Nelson-street, Spring-hill, Union-court in Mill-street, Brasshouse-passage, Baskerville-place, Lower Camden-street, Barrack-yard, and others in its vicinity.

District C.—Mr. CLARKSON.

The most unhealthy parts of my district are Henrietta-street, Water-street, Fleet-street, and Little Charles-street; whenever any contagious disorders are present these parts are the most heavily visited. For the greater part of last year these localities were never free from typhus, scarlatina, and diarrhoea. When these diseases again prevail, I have no doubt they will fall upon these spots severely, unless in the mean time they are much improved in their sanitary condition.

District D.—Mr. RODEN.

Places which have recently been affected by epidemic, endemic, or contagious diseases, such as fever, measles, erysipelas, small-pox, and diarrhoea:—Hospital street, Upper Hospital street, Upper Tower-street, Farm-street, George-street, Hampton-street, Hockley-street, Harford-street, Upper Tower-street, Howard-street, William-street North.

District E.—Mr. JONES.

Bagot-street (4 court 5 house), the dwelling-house (4 court 5 house), occupied by Ingram's, is in a filthy and unwholesome condition, having been the nucleus of typhus fever since the beginning of August, 1848, and requires first, the removal of its inmates; second, the fumigation of the house by chlorine.

District F.—Mr. FIELD.

Cases of epidemic, endemic, and contagious diseases attended during quarter ending December 30, 1848.

INFLUENZA.—Princess-street, Stainfor h-street, Snow-hill, Loveday-

* Population of Birmingham in 1841 138,187
 ,, Meriden, Solihull, and Alcester, in 1841. 40,841
 (Extracted from Tables published by the Health of Towns Association.)

street, Slaney-street, Lench-street, Weaman-street, Price-street, Brick-kiln-street, Steelhouse-lane.

DIARRHŒA.—Steelhouse-lane almshouses, Lancaster-street, Stainforth-street, Slaney-street, Snow-hill, Weaman-street, Loveday-street, Princess-street, Price-street, Whittall-street, Shadwell-street, Balloon-street.

MEASLES.—Stainforth-street, Cotterills.

SCARLET FEVER.—Lench-street, Lancaster-street.

DYSENTERY.—Stainforth-street.

District H.—MR. HILL.

I have had cases of typhus and mild fever as undermentioned:—Old Inkleys, New Inkleys, Myrtle-row, Green's Village, Tonk-street, and Hill-street, but not in sufficient number to constitute an epidemic; also a few scattered cases of measles, scarlet fever, and whooping-cough. There has been no particular disease prevalent for the last three or four months.

District I.—MR. BADGER.

In Cheapside, diarrhœa, scarlet fever, and measles, have been very prevalent; Essex-street, fever prevalent; Barford-street, diarrhœa and fever prevalent; Nelson-street South, scarlet-fever; Edgbaston-street, fever, measles, and diarrhœa prevalent; Court 15 is scarcely ever free from fever.

District K.—MR. SPROSTON.

There has been no disease in my district since the 1st of November of either an epidemic or endemic character, which perhaps is rather to be surprised at considering the locality and the class of people living in it, consisting as it does chiefly of the low Irish whose habits generally are of the most filthy kind, but there are many things which tend to make my district a very bad one; for instance there is throughout a very bad and *insufficient* supply of water, and in many places *no water whatever*; the sewerage and drainage also is very defective. These, combined with the confined state of some of the courts, make my district very liable to both epidemic and contagious diseases. I feel very confident that if an inspection of this part of the town were instituted it would be attended with very beneficial results.

District L.—MR. SIMONS.

I wish to call particular attention to the state of the drainage in several of the courts in Duke-street and Sheep-street, in consequence of their being below the level of the streets, in which there is no main sewer. I would particularly mention No. 3 Court, Duke-street, which is always covered with pools of stagnated filth. No. 9 Court and No. 6 Court, Sheep-street, the latter is very bad; there are about 12 houses in this court, and when I visited it the other day one-sixth of its surface was covered with water, at one part being at least a foot deep; this all runs into a cistern, from which it is pumped into a well as occasion may require. I fear there is no remedy for this evil but a main sewer, but

it must be very bad for the health of its inhabitants, and tend to produce fever and other contagious diseases.

Masshouse-lane, No. 22 Court.—The drainage in this court is very bad at times; the water mixed with the ashes and filth from the dust-hole extends itself up to the court in front of the houses, to approach which to see patients I have been obliged to walk on bricks placed for the purpose, and the poor have been unable to prevent the filth from running into their houses; this state of things unless removed may tend to produce fever and other contagious diseases.

Most of these places I personally inspected, and found that want of water, of drainage, and of proper pavement to the yards was common. Many of the courts, like most places where cottages are situated in the centre of a large town, are closed in on all sides, and are entered from the street by a covered passage; the privies and cesspools are crowded against the houses, and there is a deficiency of light and ventilation; there are about 336 butchers in the town, most of whom have private slaughter-houses crowded in amongst the cottages, and there are many other things calculated to create such offensive nuisances as are described in the evidence.

PRESENT STATE AND CONDITION OF THE TOWN.—As the inhabitants of Birmingham are aware of the great inconvenience arising from divided management, I will not enter at length into the question, but beg to direct attention to the evidence on this subject; there is a general wish to have one form of local self-government which shall give them the means of carrying out all desirable improvements. For although the town is more favourably circumstanced than many others of a similar extent and population, yet there is a vast improvement required to place it in that condition so necessary to health; the water supply is limited, and frequently bad in quality. There are about 2,000 close courts undrained; many unpaved; and where privies exist they are frequently a source of nuisance. I would beg particularly to direct attention to the medical evidence on this point, especially to that of Mr. Hodgson and Mr. Russell, which I have given as Appendices to this Report. I cannot refrain from expressing personally my great obligations to these gentlemen for their most valuable assistance, and I am sure the people of Birmingham must ever consider with gratitude and pride the earnest and disinterested services of their medical gentlemen in general, who have voluntarily given their services gratuitously as “Medical Sanitary Inspectors,” and have in every possible way aided sanitary improvement.

BIRMINGHAM PERSONAL INSPECTION.—Accompanied by Mr. Smith, surveyor, and Mr. James, the high bailiff, I proceeded to Bridge-street West, where I noticed that the cottages all

have open, well-paved yards, and small wash-houses, and many on the outskirts have small gardens; the privies and wash-houses are, however, close to each other.

Plan of Cottages.—The cottage property in the suburbs of Birmingham has generally the advantage of wide open streets, or open courts, with a small plot of ground in front to each house, railed off, and frequently a considerable open space at the back, which is used as a yard; or, as to those shown on the plan, "Gardens." These cottages have a clean, neat, and cheerful appearance while new; but proper drainage and a full supply of pure water is much needed. In the plan, it will be seen, that the privies are in contact with the wash-house; they stand upon a cesspool, which is continued to the front, where it is covered with a trap-door, that it may be removed to empty it. These cesspools are close to the well and pump, and as the subsoil is sand or gravel, percolation from the cesspool to the well must take place. The drain shown only serves to remove surface slop-water, and in general empties itself into the nearest open ditch, there to fester and stagnate.

The cost of the present imperfect and most objectionable arrangement is as under:—

	£.	s.	d.	
Privy	3	10	0	
Cesspool complete	1	0	0	
Well and Pumps	7	10	0	} Half only charged, as one serves two houses.
Drain	1	10	0	
	<hr/>			
First cost	13	10	0	

Annual Expenditure.

Emptying cesspool	s.	d.
Maintenance and repairs to pump.	7	6
To repairs and cleaning drain	5	0
	2	6
	<hr/>	
	15	0

Abstract.

£13 10s. at 5 per cent.	£.	s.	d.
Emptying cesspool and general repairs as above	0	13	6
	0	15	0
	<hr/>		
Annual rental and cost	1	8	6

Estimate for perfect Drains, Water-closet, and a full Water supply.

Water-closet complete	£.	s.	d.
	2	10	0

BIRMINGHAM



FRONT VIEW



BACK VIEW



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	s.	d.
£2 10s. at 5 per cent.	2	6
Annual water-rent	6	0
Annual sewer and improvement rate of 4d. in the pound	3	4
	<hr/>	
	11	10
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Or a direct saving of 16s. 8d. a-year.

This saving of 16s. 8d. does not represent more than the mere direct money saving, as there is the constant stench of the cesspool avoided, and the annual nuisance of a general cleansing prevented. The water supply contemplated must be pure and constant, laid on in each house, and there will be sinks to remove all slops and refuse water direct off the premises. The external walls at the back of some double cottages are only $4\frac{1}{2}$ inches thick; the joists are also too slender and too far apart; they are $5\frac{1}{2} \times 1\frac{1}{2}$, and 17 inches apart, 8 feet bearing. No wall plate. These cottages cost about 60*l.*, and let for 4s. per week; this is exclusive of the ground rent.

One great disadvantage of building houses slightly, and without drainage and proper conveniences, is, to induce tenants to take them when new, and only remain for a limited time, as they necessarily soon get out of repair, and into a bad sanitary condition. The streets are unpaved, and the Commissioners will not do the work, as they have no power to raise a general rate for this purpose, or to compel the landowners or owners of property to do it; there are no sewers or efficient drains, and, consequently, in winter, the property is surrounded with filth, and the inhabitants move as soon as possible into a new district. These new streets have no drains, pavement, or public light, and for want of these in the first instance, district after district is vitiated as described. I had numerous complaints on the want of power to do this necessary work.

Birmingham Parish.—Mr. Henry Beaumont, the owner of some property in Eyre-street, near to Stewart-street, wishes to be made to pay for the improvement—he would be uncommonly proud to be made to pay for proper drainage; he would have done it if possible, but some parties will not do their portion of the work.

There are many streets in this district not formed, and the Commissioners will not take to such as are not; they have no powers, as stated, to compel landowners to make streets fit for use.

Tuesday morning, May 1st, 1849, accompanied by Mr. James, high bailiff, Mr. Smith, surveyor, Mr. C. Yates, Lord Calhorpe's agent, and Mr. Bliss, inspector of nuisances.

Francis-street, Edgbaston.—There are open ditches here, but

no drains; the drains from water-closets run out into the surface gutters.

Hagley-road.—Thirty yards wide, with detached villa residences, and terraces on each side. These houses let from 60*l.* to 150*l.* each per annum. There are no drains, but open ditches on each side of the road, full of green and fetid matter. Water-closets are discharged into these surface ditches. There are cesspools on many of the premises, the overflow from which finds its way into the local wells, &c. Some of these roads have drains made in them, but few of the houses make use of them, they use dumb wells. At Mr. Deyken's, in 1849, a dumb well or cesspool on the premises required to be emptied, and men were engaged to do the work at a cost of 2*l.*, but the smell was so bad they required an additional 1*l.*, and lastly an additional 1*l.*, and a pint of brandy each hour.

Worcester and Birmingham Canal, Edgbaston.—The drainage from the houses passes over the towing-path into the canal. See the evidence of Mr. Hodgson, Mr. Russell, and the petition from Edgbaston, as to these nuisances.

Bristol-road, Edgbaston.—This is a fine wide road, with villa residences; drains from water-closets pass out direct into the surface gutter from the higher side of the land, those on the lower pass into the meadows; the ditches are much complained of. Flat arches here; the roofs of the houses are made of plain tiles set in cement.

Persia-road, Birmingham.—There is a beautiful spring here, which might be made available for baths and wash-houses; it is at present carried off by a surface-drain, but was formerly used by the inhabitants.

Valley of the Rea.—A wide and flat alluvial surface of sand and gravel, wet and damp for want of proper sewers and drains.

New houses let immediately, but for want of proper convenience they are soon dirtied and put out of condition; the parties then leave them for others which are new, as previously stated. The houses are built without order, slight and cheap; there are cellars half full of water.

Barford-street.—There is an open ditch here full of cesspool refuse, built up to on both sides. In No. 15 Court in this street, there is an open filthy drain on the surface; the house next to the privy has fever at the present time. The open ditch here cost 45*l.*, in two years, to clean it; it might have been permanently sewered for much less money. The Commissioners clean it, but have no power to sewer and cover it. The land is covered with rubbish, and all open and unpaved.

River Rea.—On the right of Mosley-street there is a large

open, stagnant cesspool, in the old river-course, very filthy. There is a portion of this old river-course eight feet deep of refuse; there were five cases of fever fatal in one house in 1847. About 100 yards cost 45*l.* in two years to cleanse it, and it is now as bad as ever.

A 9-inch pipe would drain all this district.

Joseph Bills, of Mosley-street, complains of this nuisance; says many cases of fever have taken place here. All the inhabitants complain.

Yards near Three Tuns, Digbeth.—There is a close yard here with open middens and privies, with an open sewer behind. the bed-room windows open right over the open drains; one of the front houses has had fever. There is a new culvert within a few feet of this property, but the landlord refuses to drain into it. They are sinking a new well here; it is gravel and marl for 10 yards, then rock; the well and pump, I am informed, will cost about 25*l.*

White Lion-yard.—The privies and open ditches here stink most abominably. The rent of the houses is 2*s.* 2*d.* per week; these houses are, however, kept comparatively clean.

This place might be drained easily and cheaply into the new sewer. They are now paying more for a well and pump than would drain and supply the premises with water-closets and water. There is a second pump within five yards of the one now forming in the same yard.

This is a proof of the want of compulsory power to drain as well as to sewer, and the cost of this second pump and well in such a place proves the necessity that exists for a full water supply.

Samuel Cockayne, Butcher, 226, High-street, Deritend.—There is a boundary ditch betwixt the houses, walled in but uncovered; the privies and water-closets open into it; the smell is dreadful. The mistress says it makes her sick and dizzy at times; it did so on last Saturday. 61*l.* has been paid for cleaning this place within three years, for 70 yards in length. Mr. Hodgson names this place in particular in his remarks; this sum would have drained it three times over.

Mill-stream, Lawley-street.—This is a large open stagnant space, full of green fetid matter.

The Commissioners have expended in two or three years for cleansing refuse which ought to pass off by the drains and sewers,—

	£.
Barford-street	45
Old bend of the river Rea	45
High-street, Deritend	61

£151

If this sum is divided by three, the greatest number of years over which it has been expended, it leaves an annual sum of 50*l.* 6*s.* 8*d.*, which, at 5 per cent., is equivalent to a capital of upwards of 1000*l.*, a sum which ought to drain 1000 houses. The loss from fever and sickness must have been very large.

The Derby Railway Station.—The river Rea comes down here, and is dammed up about 8 feet for the purpose of irrigating the valley below; there are weirs further down the stream for the same purpose; there is a large open area of stagnant refuse from drainage at the Railway Station, with pigsties, the river Rea below. There is much fever about here, although so open; the sewage of the town passes into the Rea, which is exposed and open below here.

New Meeting-street.—There is a new sewer up this street, and also an open drain betwixt two properties, full of refuse; there is no power to compel the parties to drain into the sewer made; the nuisance is very bad; the drain is built up betwixt the houses. There are privies and cesspools immediately over the sewer, but having no communication with it.

The fish-market is at present on the side of the street at Dale-end, but it is about to be removed into the large general market.

Wednesday Morning, May 2, 1849.—Accompanied by Mr. James, high bailiff, and Mr. Bliss, inspector of nuisances.

Gloucester-street.—There are 24 slaughter-houses here, and a place for boiling down meat for certain purposes. Pigs are kept on the blood and garbage; one of the butchers said they could not live if it was not for the pigs, which act the part of scavengers.

Jamaica-road.—Carcass-market for dead meat, occupied Tuesdays, Thursdays, and Saturdays.

Canal-street.—Knacker's yard; there were 19 dead horses and a donkey here.

Cheapside.—There is another knacker's yard here. Pigs are kept in these places, and Mr. Bliss states, they tear the entrails out of the horses warm; in summer the place becomes alive with maggots. There are no efficient drains in these places.

Brass-house Passage.—A note relating to this place, from Dennis Duggan, was handed in, as also the following medical certificates:—

Population	68 adult males.
	78 adult females.
	32 children under 15 years of age.
	108 ditto 12 ditto.
	20 lodgers, male and female.

306 resident inhabitants.
Houses inhabited. 64.

Medical Certificates as to the Condition of Brass-house Passage.

I hereby certify, that in my opinion Brass-house Passage is the worst drained place in this part of the town. Whenever fever is prevalent it is to be found in this street (if it may be so called). It is so bad that I always advise all who can to leave it, in the hope that by this means either the landlords or the Commissioners would be induced to improve it.

Witness my hand this 1st day of May, 1849.

(Signed) W. SANDERS.

I fully concur in the opinion given by Mr. Sanders, as to the unhealthy condition of this locality.

(Signed) DAVID BOLTON,
Demonstrator of Anatomy at Queen's College.

Having frequent occasion to visit this road or passage, I can fully bear out the truth of the above statement. I have not seen any other road in any other part of Birmingham in so filthy and dangerous a state; and of my own knowledge it has been a fertile cause of disease.

(Signed) WM. MOSELEY RICHARDS,
*Surgeon to the Birmingham Dispensary
and Infirmary.*

I have never seen any part of this town permanently in so filthy a state as Brass-house Passage. In the winter it is almost impassable; in the summer never free from mud. Typhoid fever and scarlatina prevail in the neighbourhood; and I have frequently urged upon the inhabitants the absolute necessity of proper drainage, and a thorough repair of the road.

(Signed) SHIRLEY FIELDING PALMER,
Surgeon.

The new streets on the outskirts are in a most neglected state for want of power to drain and pave them, and many of the best houses drain into the public road. A vast mass of evidence was tendered on this subject, of which I submit the following:—

The STATEMENT of the undersigned Inhabitants of George-street, Edgbaston.

SHEWETH,

THAT they frequently experience great annoyance from the highly disagreeable effluvia which proceeds from the drains in their neighbourhood; that the noxious character of these effluvia is but too apparent from the suffering health and frequent fevers that have prevailed in many of the houses; that the large number of deaths which have occurred have attracted the observation of many of the residents; that at least one medical man has been heard to declare that the worst districts of the town are not so much visited by fever as this; that these injurious influences are probably in part to be attributed to the drains being too flat and confined, and inadequate to carry off what flows into them; that this is again aggravated by there being no sufficient quantity of water at command to cleanse and keep them free;

that there appears, so far as they can learn, to be no jurisdiction authorized to originate, watch over, and control these things, and to whom an appeal can be made when a remedy is required, and that some partial improvement which has taken place at one end of the street was effected by private subscription; but the undersigned wish especially to call your attention to the fact that not only the drainage of this street but of a wide adjacent area finds its way into the Worcester Canal which runs at the backs of the houses on one side of the street, and that in the case of one important drain the issue is over the towing-path of the canal; that when the water is low or the dredging-machine at work the smell is extremely bad; that the Canal Company have given notice to the surveyor of the highways to remove these drains, while he pleads that 37 years use have confirmed a title, so that unless some competent authority steps in to force sanitary regulations, the comfort and health of the inhabitants will continue to be sacrificed and put in hazard.

We, therefore, earnestly and respectfully request your attention to and personal survey of the case.

(Signed)	FRED. W. HARROLD.	WILLIAM LEAN.
	RICHARD HILL.	WILLIAM IZOD, sen.
	ARTHUR ALLBRIGHT.	WILLIAM IZOD, jun.
	E. LILLINGSTON.	JOSEPH WOODWARD.
	THOMAS TYNDALL.	JAMES PRICE, jun.
	RUSHTON AINSWORTH.	WILLIAM ROCK.
	JAMES HUNT.	JOHN C. WYNN.
	GEORGE GOODRICK.	MISS HARNOLD.
	W. H. REECE.	JAMES GARGORY.
	J. H. GIMBLETT.	

The town clerk stated, "they are all very respectable persons." Mr. Haines, "no doubt, highly respectable." Mr. Wynn, "I believe, sir, that if it were necessary every inhabitant of the street would sign the petition cheerfully." The town clerk, "and that, sir, is the court end of the town." Mr. J. B. Payn, Chairman of the Birmingham and Worcester Canal, attended to say they were ready and willing to render all the aid in their power. The following letter from Mr. Horton is confirmatory of the above statement:—

DEAR SIR,

George-street, February 26, 1849.

WHEN you called on me last week with a memorial for signature respecting the defective drainage of George-street, I was under the impression that at our end of the street we had not much to complain of, and that we had a main sewer passing under the canal. I since then have reason to think such is not the case, and beg to hand you a few remarks which you can attach to your memorial, should you consider them appropriate to the good object you have in view.

After leaving my house on Saturday I went along the towing-path of the canal, and found everything represented in your memorial existing in the shape of nuisance, and even more; and I am fully convinced that it is a duty we owe to our families and neighbours to beg of the Health of Towns Commissioners to give imperative orders to the

surveyors to be prepared to lay down efficient drains to pass under the canal; the first general stoppage, which usually takes place about Midsummer.

But, sir, you must not suppose that if we obtain a good and proper drainage from the houses in George-street, that we have done all that will be necessary to improve the health of the inhabitants of this vicinity. If you will walk along the tow-path towards Birmingham, before you have passed a distance equal to half the length of George-street you will find the said nuisances of which you so justly complain in your memorial existing not only tenfold in number but more aggravated in degree. Before you arrive at Bath-row Bridge you will find much to complain of; but as soon as you get under Bath-row Bridge you will find the dirt and filth from a whole street of small houses rushing from small soughs, without any channel being provided for the disgusting matter to pass down the very steep embankment to the tow-path; a considerable proportion not being able to make its way is accumulated on the shelves of the embankment; a more disgusting sight the inspector of nuisances of the borough of Birmingham will not be called to witness I really believe. This spot alone is quite sufficient to account for the unhealthy state of the neighbourhood, and I think the matter has only to be pointed out to the Commissioners to have the requisite alterations made at once.

It is my opinion that there is a large main sewer passing down Holiday-streets, and the parties building houses in Communication-row should have built into that drain instead of turning their privies, &c. down to the canal, and they will be obliged to make the alteration at once when the matter is explained to the Commissioners.

If there is anything I can do to forward the good cause pray command me.

I remain, dear Sir, yours respectfully,

JOHN HORTON.

To J. Goodrick, Esq., George-street.

Mr. R. T. Cadbury stated, "I can confirm very much of what is contained in that memorial. I hope that it will claim your particular attention; not merely that street but all the streets adjoining, as they are almost deluged with filth. In the Hagley-road the gutters are receptacles of drains and filth till they become in a most putrid state, reeking with the contents of waterclosets in the finest neighbourhood of Birmingham." Several of the gentlemen, some of them Birmingham Street Commissioners, complained of the utter impossibility of constructing sewers as they were at present situated, and they complained of the nuisances around their own houses. One gentleman remarked, "There is a drain from a water-closet passes under my house out into the road in front, the effluvium from which at times is beyond measure painful." The town clerk remarked, "All this shows the necessity of this inquiry in Birmingham." *Mr. Haines* remarked, "It does most decidedly show that."

In 1845 the Commissioners of Duddeston and Nechells obtained an Act which cost the rate-payers of these hamlets 2000*l.*, and to oppose which the Corporation expended 2,000*l.* more. By this Act they were empowered to borrow on the credit of the rates 9,000*l.*, they have laid out in one culvert 4,000*l.*; evidence was tendered to show that more money was expended on it than was necessary, looking only to the draining of the hamlet; and that this expensive culvert is of little or no benefit to the hamlet through which it passes, as one part is too low and other parts too high, and that no side or cross street-drains have been laid in. A special Act of Parliament is required which will give to one competent body power to adopt some comprehensive plan of sewerage throughout the borough.

This want of power is felt and complained of by all parties, and much has been written and said at public meetings, and in the press upon the subject within the last ten years. A sanitary report was drawn up by a Committee of physicians and surgeons on the state of the town some time since, and a report by the Rate-payers' Protection Society was printed and circulated in 1848; both these I have consulted carefully, and they have afforded much valuable information, some of which is embodied in this Report.

The Committee of Rate-payers say,—

“The three boards in Deritend and Bordesley have no powers for promoting the comfort and the health of the inhabitants. Where filth accumulates there it must remain. The Surveyors of Deritend, the Surveyors of Bordesley, and the Commissioners of Deritend and Bordesley, make, levy, and collect rates. One Board professes to repair and mend the footpaths, and another the horse-roads, neither allowing the other to encroach upon its prescribed jurisdiction by even the removal of a stone. The external appearance of the hamlets have not been in the least improved during the last century. The stagnant filth and the putrid accumulations, which are allowed year after year to exist in the several parts of Deritend, without any attempts at their removal, or any efforts being made on the part of the authorities to relieve the industrious poor from the baneful effects of inhaling the atmospheric impurities they engender, are a disgrace to civilization. The foul choked-up ditch, which extends from Deritend Mill to the Midland Railway Station, is a most grievous and intolerable nuisance.”

REMOVAL OF NUISANCES.—The remarks of Inspector Bliss on this subject are highly important. The Removal of Nuisances Act so far has been beneficial to the country as a preliminary measure, but it is only preliminary; for instance, empty a cesspool, it gets full again; and if this cesspool is situated in an open court, and under a house, or in close contact with one, the filth percolates through the wall. The following evidence shows the great anxiety there is for improvement:—

Mr. William Wills:—

“I wish to mention the position of a portion of the Bristol-road within the borough, which lies between the end of Wellington-street and the turnpike-road, in the parish of Edgbaston; but a part of the borough, the portion I refer to, is between the end of Wellington-street and the turnpike-road, in extent about a mile. There are many of the houses in the road from which the contents even of the waterclosets are turned into the gutter. The condition of the locality is at times exceedingly offensive, and is a disgrace to the authorities of the borough, if there are parties who have a controlling power, and if there is any controlling power the sooner it is put in force for the sake of the borough, and likewise of the vicinity, the better it will be. I am assured by my friend Dr. Percy that if any contagion were to arise in the borough this would be one of the most likely parts in which it would be, and yet this is in a great thoroughfare, a great highway leading from Birmingham to Bristol.”

“I am one of the Commissioners of the roads, and we (that is the Commissioners) applied to Lord Calthorpe’s agent and induced him, at an expense of several hundred pounds, to put a culvert from the bottom of Sir Harry’s-lane to the river Rea. Our hope was to form a channel by which the offensive matter would have been disposed of but it has not been the case. The Commissioners had also a hope that their powers under their Act of Parliament would enable them to compel parties to get rid of the offensive matter of which I complain. It is found, however, that neither under that Act of Parliament or any more general Act are the powers of the Commissioners so clearly defined that they could venture to act on them, at least so we were advised by the clerk of the Trustees. Therefore the nuisance is now existing, and a very great one it is.”

The following is another form of complaint, and shows most forcibly the necessity for a continued system of management and means of forming sewers.

Mr. Atkin:—

“I wish to complain of a nuisance in Barford-street; our cellars have now been for the last five months from nine to twelve inches deep with stagnant water, although we have emptied them something like a score of times; we allowed the water to remain until it began to stink, and then we have been to the expense of baling it out in buckets, but it comes in again, until it is fruitless; we staid until it was unbearable; in fact, it was unfit to reside near the place. It has been much worse since the new culvert has been put down, whether the culvert is higher and throws the water up, I cannot tell; previous to this we had no such water only during heavy rains, then it would go off in something like a month or so, but now we have had it for five months. It is possible that it may arise from the accumulation of filth in this drain. I have resided in the street upwards of twenty years, and I do not recollect an instance of its being cleaned out; but the impediment seems to me to be in the bed of the river Rea being so high. I have another property where I am going to raise the cellars, because they complain of the stench from the new culvert. It is on

Macdonald's ground; there is only a small culvert which runs into the bed of the river. The river wants lowering. We have only just begun to feel this great nuisance; one of my tenants only yesterday complained of the water from the pumps being blocked up and not being able to get away. We have a pump which has been fitted up to empty a cesspool; we cannot get proper drainage for that property in fact, the sewer would be of no use unless the bed of the river was lowered, so that the water might run away; but I am not by myself in Barford-street, because some few months ago, some ten or twelve houses were quite as bad, although the cellars are so low you cannot without difficulty get into them. Upon one occasion the water got into the cellar and spoiled me about 20*l.* worth of steel. We used to keep things in the cellar but now we cannot."

A LIST of NUISANCES furnished by *Mr. Bliss*, Inspector of Nuisances.

SIR,

June 1, 1849.

IN reply to your note, dated the 28th ultimo, which I did not receive till the 30th, I have sent you a list of what I consider some of the worst nuisances in Birmingham, viz.—

An open ditch, situated at the back of the west end of Lombard street, about 70 yards long, averaging from 1 to 4 yards wide, and in some places 7 feet deep, which is a complete pond of stagnant filth close to which several fatal cases of typhus fever have occurred. The cost for cleansing it has been 45*l.* in two years.

An open ditch, situated between Barford-street and Bishop-street which is about 200 yards long by 1 wide, containing the refuse from the privies and pigsties in part of the above streets, which almost remains stagnant in it. This has also cost the authorities 45*l.* for cleansing in two years.

An open ditch, formerly an old river course, situated at the back of Bar-street, and crossing Lawley-street near the Derby Railway Station, which I might say contains from 400 to 500 tons of night-soil and stagnant filth.

The above places are general receivers of all the filth in their immediate neighbourhood, such as dead dogs, pigs, &c.

A ditch at the ends of several courts on the east side of Digbeth part of which is uncovered, and contains some tons of night-soil and other filth, the windows from some of the dwelling-houses opening over it.

The drains in the Bristol and Hagley roads, which contain the filth from the water-closets in the neighbourhood, are now in a most disgraceful state, the filth in different parts laying a foot deep in them but the description of complaints that are the most frequent have reference to the privies that are built against dwelling-houses or party-walls the filth from them penetrating into the cellars, and in some cases the pantries adjoining them.

The knaekers' yards, bone-boilers, horn button-makers, fellmongers, tallow-handlers, and dogs' meat boilers, &c. are most intolerable nuisances to be in the centre of the town.

I beg to remind you that part of the above nuisances were brought under your notice at the time you were in Birmingham.

Under the Act, since it was first put into operation in Birmingham (I mean the Nuisances Removal Act of 1844), the total number of complaints has been 528, of these 216 have been removed on my application; 118 have been certified by medical gentlemen, summoned, and ordered to be removed by the magistrates; 91 cases have been removed after the medical gentlemen have certified them; but previous to their being summoned, that is to say, if I go to-day, and the medical officers certify them to be injurious to health, to-morrow morning before I could get out a summons they would be removed; 48 cases which have been visited by the medical inspectors have not been certified; 17 cases have been summoned and dismissed by the magistrates; some through technical objections, and others because the Act was not sufficient to meet the case; and there have been 38 not within the meaning of the Act, that is to say, I did not think we had sufficient power to deal with them; making a total of 528.

These are the cases under the removal Act up to the end of 1848. The number of cases complained of to the end of February 10, 1849, has been 211, of which 9 were not within the meaning of the Act; 140 have been removed on the service of my notice; 58 have been summoned, of which 8 have been dismissed; 50 have been ordered to remove the nuisances within a certain period, and 4 cases have not been disposed of, making a total of 211. Although the cases have been removed, it does not eradicate the evil; if I were to remove my attention they would quickly be as bad as ever.

N.B.—We have had lately several fatal cases of fever, supposed to have been caused by the filthy and over-crowded state of dwelling-houses.

Speaking of the want of general power to drain the whole borough, *Mr. Smith*, the surveyor, says:—

“We find difficulty with the cramped area; we are naturally confined to an area to which we have no outlets. We have found difficulty with the outlets in Aston; we have also found difficulty with private individuals as to the use of the sewers. There are many water-closets, and they are increasing daily. The water-closets do not generally resort to the use of the new sewers; there are dumb-wells and cesspools into which the water-closets pass in some districts extensively. I may mention that out of the old sewerage only 75 communications have been made out, although upwards of 400 exist. We have no power to compel private individuals to drain, or to pass their existing drains into our new sewers. I have no calculation as to the cost of private water-closets being opened into the sewers. I consider a bog-hole (a cesspool) a greater nuisance than a dumb-well; there are local wells in the immediate neighbourhood of the dumb-wells, but this more particularly applies with regard to bog-holes, even in the best as well as the other portion of the town; we may say that in practice open cesspools are in general use. The Commissioners have no control over the removal of nuisances created by cesspools and bog-holes; they are not cleansed under any general order. There is not any establishment for the regular cleansing of the whole refuse, but several applications having been made as to the overflowing of bog-holes, the Commissioners interfered in some few cases until an establishment has grown up for the purpose of emptying

them; but it is not sufficiently extensive so as to embrace the whole of the district within their jurisdiction nor anything equal to it."

Many complaints were made as to the want of depth in the river; there are several weirs erected on it, and the refuse thrown in gradually fills the bed and blocks the current; all these complaints will be removed by proper sewers laid at sufficient depth.

Mr. John Way says:—

"In Macdonald-street I built a house some five years back; and when I built the house there was a culvert in the street, and I had a drain from the cellar which I was obliged to put into it, because I was led to understand that floods would arise in the river. When I put down the cellar at first it was quite dry, but since then the water has risen above the top of the culvert. When I built the house I understood from Mr. Macdonald that the river should be lowered. The cellar is only 6 feet 6 inches high now, and it will soon be less than 5; about a fortnight back the water lying in the cellar stunk so badly that I had occasion to throw about 100 buckets of fresh water to mix it a little. I wished to make the best job of it I could; I have put a stench-trap, but if things go on so I shall have to raise the cellar still higher. Mr. Atkins next door is about to raise his cellar; he thinks that his cellar is made worse by mine having been raised. Our pump is very good; the other morning I set to and pumped for about a quarter of an hour to try and put some clean water in and drive the foul water away."

As there is no power to sewer or pave a street in its first formation, many of them become impassable.

Mr. Holland, a surveyor of Bordesley, on this head says,—

"I have had frequent complaints of a street called Brewery-street. This street comes near to the point of division between the two hamlets and neither of the local Boards will claim it; the consequence is that it has got into such a state for want of repairs, that the Commissioners have been compelled to put down stumps to stop it up, although a very useful thoroughfare. They had no power to repair it, therefore they placed the stump to prevent accidents."

Not only is it highly desirable to have power to sewer and pave a street on its first formation, but it would tend to the convenience of the whole community if, in many instances, the line of direction could be dictated, or at least controlled and modified according to one general and uniform plan. For want of such arrangement and foresight in former times, much injury has been done to health, and damage to business, by ill-ventilated and crooked narrow streets, which have become lines of great thoroughfare. Many thousands of pounds have been expended in Birmingham latterly to remedy some of these defects. The future increase of the town should therefore be most carefully looked to. On this subject Captain Vetch remarked in 1842,—

"The points requiring the attention of the engineer and architect ma

be stated as follows:—complete ventilation, complete drainage, ample sewerage, ample supply of water, and lastly, a ready and good communication between the various portions of the town.

“ Most of our large towns have increased upon small, irregular nuclei, and received their increments chiefly from buildings erected along the roads branching into the country, presenting so many streets radiating from a centre, but leaving the intervening spaces to be irregularly and imperfectly filled up at subsequent periods as chance or necessity directed.

“ So great is the above defect, that it is often difficult to pass from one site in the skirts of a town to an adjacent one, without passing towards the centre of the town by one radiating street and returning by another.

“ *Ventilation.*—In new towns, or the increments of old towns, good ventilation will be best secured by attending to the principles laid down for the construction of such.

“ The noxious ingredients which must exist more or less in the atmospheres of all large towns, may be dissipated by currents of air, or diluted by access to large open spaces, while the origin of the evil may be much reduced by a good system of sewerage.

“ For the removal of noxious vapours existing in crowded towns, the following points deserve attention:—

“ First. The conversion of blind alleys into thoroughfares.

“ Second. The continuation of leading streets through blocks of houses on which at present they abut.

“ Third. The opening of wide and straight streets through the meanest, most complex, and crowded parts.”

The several railways which have entered Birmingham have destroyed much poor property, but in a manner most objectionable. No provision was made for the accommodation of the inhabitants compulsorily turned out of their dwellings; and, as many of these were very poor persons, and had chosen their residence to be near their work, much inconvenience has been experienced; in some instances the consequence has been injurious overcrowding by parties taking rooms in occupied court-houses. The great evil, however, has been in an objectionable mode of reletting those houses which were not at once taken down, to parties who have put them to a most vicious use. They have been farmed at a low rental, on the condition that they should at any time be cleared on a week's notice; and they have been re-let off at extravagant rentals, furnished and unfurnished, for purposes of prostitution; 5s. and 6s. a week has been obtained for an empty house half in ruins, and 10s. or 12s. a week if supplied with a little scanty furniture. The consequences have been most demoralizing, and the money income unworthy the consideration of a large and wealthy company.

SEWAGE WITHOUT A PLAN.—*Mr. Phillips*, acting surveyor for the hamlet of Deritend,—

“ We have no survey or plan of the district. We have sufficient sewage laid down to carry off the water belonging to the hamlet of Deritend. They are old sewers, and have been laid down a great many years ; but within the last three years they have been cleaned out and undergone repair, and therefore we have not had any floods of any consequence, unless the water has come from the hamlet of Bordesley. Their water would pass through our district if they would lay down sewers. They have no powers to pass through now, but we should be very happy if they would put down sewers and carry their water into ours. They have no powers to carry out a perfect system of drains, neither have they any powers to make drains for private purposes. The existing sewers would not be capable of taking all the refuse from the courts and houses. The surveyors act under the general Highway Act ; the paving and lighting belong to the Commissioners, and the horse-roads to the surveyors. The sewers are about 2 feet below the surface. We have cellars which are about 7 feet deep, but we have no means of draining them ; any water that is carried into them must be carried up again. The district is at times flooded from the higher parts of the town, and the sewers cannot take away the flood water. The population is about 5,000 or 6,000 ; the amount of rate levied 300*l.*, at 6*d.* in the pound. There are about three miles and a half of highways in the township. We have a great many cesspools into which the drains empty. These drains only take the surface water of the streets.”

The following statement was made by *Mr. Webb*, clerk to the Commissioners of Deritend and Bordesley :—

“ We have powers under an especial Act for the district, 31 Geo. III. 1791. We find very great difficulties in carrying out any improvements for the benefit of the district. I am not aware that there is any system of deep drainage for the district. There are surface drains only ; we have no jurisdiction only to make surface-drains through or under the footpaths into the surface-gutters. The surveyors of highways have power over the whole of the streets or roads. The Commissioners have powers over the footpaths and surface-drains from the houses, limited by the extent of the lamps.

“ We have a partial supply of water from the waterworks, also from water-carts, yokes and buckets, tin-cans and pumps. There are parts of the old river course from which the river has been diverted, and here nuisances exist ; these have been complained of, but we have no power to remove them. We have the power to give notice to the owners, but the principal nuisances exist on the boundary lines, and we cannot then find out to whom the nuisance belongs. Water-closets open out on to the surface at a distance above it. We have no powers to remove this nuisance ; from the number of conflicting bodies we find we cannot do that which is necessary. We applied some time ago for a local Act, but were defeated by the inhabitants. The mayor states that the present nuisances were of such a magnitude, that the bodies contemplated drawing up a petition to the General Board.”

Much of the land in the neighbourhood of Birmingham belongs to Lord Calthorp, and I feel great pleasure in submitting the statement furnished by Mr. Yates, his Lordship's agent.

The enlightened and liberal management of this property has been of immense benefit to the town and district; but even here the want of power to drain has been seriously felt, and many nuisances at present exist.

Much land is leased or let by his Lordship for small cottage gardens; they are generally about 11 rods each, and let for 27*s.* a year.

1, *Suffolk-street, Birmingham,*
May 3, 1849.

SIR,

THE parish of Edgbaston, in the borough of Birmingham, and the county of Warwick, contains, exclusive of roads, 2,425 acres; whereof 2,065 acres belong to the Right Honourable Lord Calthorpe, and the remainder to Charles Noel, Esq., and many other persons.

With respect to Lord Calthorpe's estate, the system pursued for upwards of 40 years has been to grant building leases of various plots for the term of 99 years, reserving fixed annual rents, generally of about 1*d.* per square yard for the land near the town, but at a distance, where six or more acres have been leased in one lot, the reserved rent is somewhat less than 10*l.* per acre.

The leases contain conditions that a fixed amount shall be expended in buildings, or that every house shall be worth a certain rental. The number of houses to be built upon a given plot is limited, not more than two houses being allowed to join, and all workshops, manufactories, and small or back houses, are strictly prohibited. The houses erected under the above system, vary in value from 300*l.* to 18*l.* a-year, the latter being the lowest class of houses allowed to be built.

Probably one-third of Lord Calthorpe's estate has been already leased, the remainder being farming, accommodation, and garden land.

In carrying out the above building lettings, it has been necessary to construct many new roads, and widen and improve old ones, which has been done at the entire cost of his Lordship, upon a liberal scale, and under all the roads made within the last 20 years (with a few unimportant exceptions) good and sufficient culverts have been provided for the building tenants.

In some parts of the estate, however, the sewerage is deficient; for instance, the Hagley and Bristol roads. In the Hagley-road, near the Five Ways, the houses were built upwards of 50 years since, and at that time *surface*-drainage was considered (and probably was) quite sufficient, as water-closets (with which, at the present time, all houses of the class in the neighbourhood are provided) were not then used. Several attempts have been made to induce the owners of houses in the neighbourhood to contribute to the expense of constructing proper culverts, and Lord Calthorpe has offered to pay part of the expense, and has actually at his own cost provided a sewer, which, if used, would afford drainage to a considerable portion of the road.

As respects the Bristol-road, a large egg-shaped sewer has been made at Lord Calthorpe's charge, from the river Rea into the road, near the bottom of Sir Harry's-road, sufficient for the drainage of the whole of the upper part for the length of upwards of three-quarters of a mile, and offers have been made to pay half the expense of constructing sewers along the road, but the owners of houses have not been willing, with some

few exceptions, to bear any part of the expense, and therefore the road is in the state you observed it.

It has been considered by his Lordship's agents that they have a fair claim upon the leaseholders to contribute towards these expenses, as they took the land satisfied with the surface-drains, and have a much greater interest in the value of the property than his Lordship, who is only in receipt of very moderate ground rents.

As respects the complaint of waste water being discharged into the Worcester Canal from George-street, &c., the fact is that no provision was made by the Canal Company for the natural drainage of that neighbourhood, and until a recent period, when the Commissioners of Birmingham made a culvert underneath the canal, the whole drainage of the district (Birmingham as well as Edgbaston) ran into it.

The surveyors of the highways of Edgbaston have not had power to expend any portion of their rates for sewerage, nor have they authority to compel parties laying out new streets to make proper culverts, otherwise the nuisances complained of would have been long since removed.

There are upon Lord Calthorpe's estate upwards of 250 small gardens, containing from the eighth to the sixteenth of an acre each, and let at the rate of from 10*l.* to 15*l.* an acre, according to situation. These are much sought after, and are found to be highly conducive to the health and morals of the various occupiers, who are principally inhabitants of the town of Birmingham, engaged in manufactures and shops.

I trust you will excuse me calling your attention to the subject of an abundant supply of water being obtained for cleansing the sewerage of the town, and the ordinary uses of the inhabitants. Mr. J. P. Smith's suggestion to bring the water of the river Rea along the Worcester Canal appears to me a very excellent one, and deserving the fullest consideration.

I shall have great pleasure in giving you any further information in my power,

And have the honour to be, Sir,

Very respectfully yours,

(Signed) CHARLES YATES.

To Robert Rawlinson, Esq.

The easy way at which land is let, namely, an annual chief-rent, has been of vast benefit to the inhabitants of Birmingham. The ready disposition to let, or sell, land has also proved mutually advantageous; the streets are also set out, voluntarily, by the land-owners at a greater width than is usual, and the benefit derived from this wise measure is reaped by all.

There is no town in England that has finer views than those seen from the suburbs of Birmingham, especially those to the south and west, which are most delightful, presenting a beautiful undulating landscape, well grassed, well wooded, and well watered. It would be of vast importance to the future town if some of this land could be set apart as public parks and recreation grounds.

TRADE AND OCCUPATION.—Birmingham and the district around it contains a vast population engaged exclusively in

manufactures and trade; men, women, and children finding active and useful employment in some branch or department of the numerous and independent trades carried on, either collectively in rooms or factories, provided by a master manufacturer, or independently at their own homes. Birmingham is not confined to one routine of manufactures; as that of cotton in Manchester and the great inland towns of Lancashire generally. Stockings at Leicester and Nottingham. Boots and shoes as at Northampton. Lace, crapes, and stuffs of various kinds, as at Norwich. Ribbons and lustrings as at Coventry. There are about 520 distinctly classified manufacturers, traders, or dealers; and about twenty separate professions in Birmingham, and each trade may certainly be divided into five branches, which will give 2,600 varieties of occupation; but I have no doubt this is understated, as there are fourteen distinct branches named in the Directory as engaged in the manufacture of guns. The trades carried on in the town are not only numerous, but they are also, in a great measure, distinct and independent of each other in their manufacture and after use. To the knives, swords, and spears of the ancient Britons has been added a splendour of finish and polish unknown to the magical blades of Damascus; and there is a small instrument of steel manufactured in millions, the pen, more powerful in the world at this day than all the swords, spears, and scythe-armed chariots of past ages. The black and dingy "naylor" of Leland has for his town companion the electro-plate and papier machie manufacturer, in the latter of which the lustre and polish of the precious metals is outshone by the iris-dyes of the pearl.

The variety of trades and occupations exercised is, in many respects, advantageous to the population; it tends to a more equal and general diffusion of wealth amongst the master manufacturers, and the means of acquiring it in moderation amongst the workpeople; there are few, if any, "millionaires," connected with trade in or near Birmingham, if we except the Staffordshire iron-masters; there are few who occupy the position of the "cotton lords" of Manchester, or the "merchant princes" of Liverpool; but there is a numerous class of master tradesmen whose wealth tends to comfort rather than ostentatious show, and there is a race of workpeople comparatively independent and self-relying. Some observant and intelligent writers have considered the prosperity of the town has arisen from its perfect freedom from the corporate trammels of past ages, or the blind, exclusive "guild," which affects to give privileges to a few, by the Chinese plan of stereotyping the initiated; any form of trade or occupation might and may be commenced and carried on without local restriction or interference, the only question to be answered rests with the individual, "Can he make it pay?"

The diffusion and variety of occupation gives an elasticity to the trade of Birmingham unknown in towns and districts confined to the manufacture of one article, or one material; and it also gives to the workmen an aptitude which enables them to change their occupation should any form of trade die out, as shoe-buckle making at the beginning of this century, which in 1812 became totally extinct; and the carpenters frequently turn gun-stockers, so that, if required, 10,000 stand of arms could be completed in a week. The variety and independence of labour exercised, produces freedom and independence of thought and action, which unfortunately has not always met with the best advisers and directors, so that one or two riotous errors have given to Birmingham a name very undeserved. In no place will there be found more freedom of intercourse between the employer and employed, or more general intelligence and comfort amongst the work-people, or more forethought and kindness from the employer for the employed.

The habits of a people may be known and judged of by an intelligent observer from many external signs; their houses, are they crowded and dirty, or open and clean; the windows, are they whole or broken; the state and condition of their privies and drains, if such exist, and if they do not exist, the condition of the surface near their houses; the means of amusement, and also by that which they eat and drink. In Birmingham there are 564 hotels, inns, and taverns, a sixtieth of the whole number of houses; but many of these are used principally by travellers and strangers, yet one such house in sixty must be considered a large number; there are 661 retail brewers, 54 wine and spirit merchants, 14 ale and porter merchants, 60 tobacconists and snuff dealers, and 10 tobacco-pipe makers. In round numbers, 1,363 places of business to supply spirituous liquors, ale, porter, tobacco, and pipes to smoke it in. This is rather more than one house in 29. There are 240 bakers and flour dealers, 300 butchers, 36 pork-butchers, 38 tripe-dressers, 9 tallow-chandlers, 43 fishmongers, 4 soap-boilers, and 3 horse-slaughterers, 622 shop-keepers, 292 grocers and tea-dealers, 201 green-grocers, 52 eating-houses and dining-rooms, and 14 coffee-houses. There are 88 pawubrokers, 19 pump-makers and well-sinkers, and 8 fellmongers and leather-dressers. There are 7 news-venders, and 4 newspaper publishers. The use of fermented liquors in public, as contrasted with coffee drinkers, is 1,353 to 14.

The progress of Birmingham is fully shown by the following list of steam-engines employed to economize and facilitate labour. Thirty years since machinery was denounced and destroyed as the enemy of the labourer, but steam is now found to be his most active assistant; destroy the steam-engines of

Birmingham, and the town would rapidly sink back to its former insignificance and comparative barbarism. The steam-power used in locomotive engines running through the town must equal that of many hundred horses.

STEAM POWER.—From 1780 to 1836, 169 steam-engines were erected in Birmingham, of which 17 had been erected in 1834, and 24 in 1835. The total horse-power was equal to 2,700 horses. In 1839 it amounted to 3,436 horse-power, consuming 240 tons of coal per day. The estimated number of persons employed in connexion with these engines was about 4,000 males and 1,300 females; and the estimated amount of power hired out of the borough was probably equal to 450 horses. Within the borough about 1,770 horse-power was employed in working metals; as 162 were used by iron-founders, first applied in 1788; 570 in rolling copper, brass, and other metals, first applied in 1790; 150 in drawing wire, first applied in 1808; 201 in iron forges and wrought-iron mills, first applied in 1816; 74 in nail-cutting, first applied in 1813; 104 in screw-making, first applied in 1819; and 24 in drawing metal tubes, first applied in 1822. In 1839 there was steam-power used within the borough equal to the labour of 54,976 men, exclusive of power hired out of the borough, equal to the labour of 7,200 men, making the whole amount of steam-power equal to 62,176 men. At present, 1849, the engine power is about 5,400 horse-power, consuming about 377 tons of coals each day, and is equal to the labour of 86,400 men; or taking 10,000 as the probable amount hired out of the borough, it is equal to 96,400 men in steam-power used in the manufactures of Birmingham alone. From eight to ten thousand persons, men, women, and children, are at the present time employed in the working of this steam-power.*

MARRIAGES in the District of Birmingham.

	Quarters ending the last day of March,									
	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848
Marriages in the District of Birmingham.	204	253	229	241	230	232	294	373	313	278

Birmingham has increased rapidly within the last 94 years. The marriages in the church of St. Martin and St. Philip were 155 in the year 1754, and 567 in 1800. The marriages in the parish churches of Aston, Deritend with Bordesley, Edgbaston,

* The horse-power of steam, for every 12 hours of work, is equal to the labour of 16 men.

St. James (Aston), St. Martin and St. Philip, were 663 in 1801, and 1571 in 1830. The population of the Birmingham district was 60,822 in 1801, and 138,215 in 1841.

WAGES.—Many of the workmen earn from 30s. to 40s. a-week, and women from 10s. to 14s. a-week. As trade is brisk or dull, these persons prosper or suffer. Many of the men work in garrets at their own houses, and have several boys under them.

PAROCHIAL RELIEF.—The number of applications varies very greatly in different years, as trade may be prosperous or dull. Within the last seven years the numbers have varied from 5,818 to 10,222.

DRUNKENNESS.—This vice is said to prevail to a considerable extent amongst that class of workmen who obtain the highest wages. The improvidence is said to arise, in many instances, from extreme ignorance on the part of the wives of these people; many of these females having been bred up from their youth in the workshops, have no knowledge of household management and economy, or any inclination for domestic industry. The habit of a manufacturing life once formed in a female, she generally continues it, and her children are left in comparative neglect to the care of a neighbour or child. To this may be traced the premature death of many children; accidents from fire are very frequent. More comfort and happiness is found in families superintended by a careful wife, where the earnings are comparatively small, than in others whose wages are very considerable, but where there is improvident management at home. Jealousies and heart-burnings frequently arise betwixt those wives and their husbands who both work in manufactories.

There are many clubs formed amongst the working classes, attended and subscribed to separately by male and female, such as building clubs, male and female sick clubs, burial clubs, watch clubs, clothes' clubs, and many others of this nature. Frequently they meet at public-houses, are promoted and managed, or rather mismanaged, by interested parties, and their principle has been quaintly and most forcibly described as consisting of the false economy of a person taking a shilling to a public-house, and giving a person or a "club" threepence to take care of it, and spending another threepence over the arrangement; and frequently losing principal and interest. Vast sums of money are expended by these clubs on unmeaning, gaudy, and childish show. Once a-year, generally in Whitsun-week, they marshal themselves into a procession, with bands of music, colours, flags, and banners dispersed along

their ranks, and each man or woman is ornamented with sashes and rosettes of ribbons. The wise and otherwise moderate teetotaller errs in this; and it is not too much to say, that more money is expended in these processions, in loss of labour and the attendant expenses of the day, than would pay the rent-charge of a full supply of water, and perfect sewage. The practice of walking in procession is said to be on the decline.

LIST OF FRIENDLY SOCIETIES in the parishes of Birmingham, Edgbaston, and Aston, which have been allowed by the Justices between Epiphany Sessions, 1830, and Epiphany Sessions, 1847, both inclusive.

The whole number is 213, of which about 159 have held their meetings in inns or public-houses, or in beer-shops; 54 have had their place of business in rooms, or school-rooms attached to churches and chapels, or in public buildings, or in private houses. The rules have been registered pursuant to the Act (9 and 10 Vict., c. 27, s. 12); the charges for which are 1*l.* 1*s.* 10*d.* Within the same time there have been 13 building societies registered, all of which have been conducted in public offices, Temperance hotels, or coffee-houses. The character of some of the Friendly Societies may probably be inferred from their names. There are Friendly Societies, Benevolent Unions, Brotherly Benefits, United Gifts, Union Sick Society, Sick Man's Friend Society, Abstainers' Gift, Society of Total Abstinence, Provident Society, and others. There is the True Blue Society, and the Honourable Knights of the Wood, the Modern Druids, and the Samaritan Lodge, the Royal Dragoons, and the Good Intent, the Society of Royal Veterans, and the Rational Sick and Burial Association. One Friendly Society meets at the Malt and Shovel; the Nelson's Friendly Sick Society at the French Horn; another Friendly Society at the Fox and Goose; another at the Bell and Candlesticks; a Gift Society at the Blue Pig, and a Union Benefit Society at the Jolly Bacchus. The Modern Druids meet at the Saracen's Head, and the Royal Dragoons at the Dog and Duck. The ladies have Friendly Female Societies, one of which meets at the George and Dragon, and another at the Bull's Head. The Daughters of Hope Friendly Society meet at the Globe Tavern: the Old Women's Society at the Village Tavern, and the Daughters of Faith hold their club at the Gate and Traveller. Some public-houses have several clubs, male and female attached to them; they generally meet once a-month, and have an annual dinner; some walk in procession to church or chapel with music and colours; the minister who preaches is paid by some one guinea for the sermon. The dinner and

day's enjoyment will not, on an average, cost less than 5s. each individual. These 213 societies will not number fewer than 30,000 members, and consequently spend at the least 7,500*l.* on their annual day. The whole amount of their year's subscription may be about 15,000*l.*; the whole amount of their expenditure 30,000*l.*—as probably a sum equal to their subscription is spent on club-nights throughout the year, and on their annual day. Thus it will be found that the artizans of Birmingham meet to contribute 15,000*l.* for club purposes, and spend 15,000*l.* more to accomplish it. The present clubs have been the means of doing some good with some evil.

A cheap and simple form of local sick and benefit club, founded upon true principles, where poor persons could deposit their savings in confidence, without risk, expense, or temptation to extravagant expenditure, would be a great local and also a national blessing.

CHARITIES—SCHOOLS AND ALMSHOUSES.—There are several public charities in the town for purposes of education, and relief to the poor.

Free Grammar or King Edward's School, was founded by King Edward VI., in the year 1552. The endowment arising from land, at that time produced only 30*l.* per annum, but at present the income is from 8,000*l.* to 10,000*l.* a year; recently the governors received a sum of about 40,000*l.* from the Birmingham, Wolverhampton, and Stour Valley Railway, and about 39,000*l.* from the London and North-Western Railway Company, both sums for property in Birmingham. There are five elementary schools on that foundation, in the town 1,200 children are returned for King Edward's school. There are 44 other schools in various parts of the town, belonging to the several denominations. There are about 48 separate charities, for which money or land has been left by indenture, or otherwise, for the use of the poor; and there are almshouses in Bellrope-croft, Steelhouse-lane, Dudley-street, and in Park-street and others.

EXISTING SEWERS AND DRAINS.—According to the evidence of Mr. Piggott Smith, surveyor to the Commissioners, about 40 miles of public and private drains and sewers had been laid down in Birmingham previous to the year 1845, but they are not laid down according to any general plan or system, and consequently do not serve the purpose of efficient drainage. Mr. Smith states, "it is essentially a surface drainage; it averages 1 foot 9 inches in diameter, and is 5 feet deep."

NEW SEWERS AND DRAINS.—In consequence of rain-floods causing much damage in the lower parts of the town, especially in the neighbourhood of Smallbrook-street, Bromsgrove-street, and Rea-street, where damage to the amount of 3,000*l.* was caused by the great storm of 1845, the Commissioners directed their surveyor to prepare sections and plans for a system of new sewers, which have since been executed as part of a general plan; but which they have no power either to perfect or carry out. In 1845, plans were perfected for these mains, which have since been executed. The first main constructed, is egg-shaped, and is 5 feet 9 inches in height, and was calculated to pass through it the drainage of 700 acres of land, covered with buildings. The capacity of this sewer, 5 feet 9 inches in height, may be taken at 100 gallons for each foot in length, and the great storm-waters of 1845, which fell in little more than half an hour, would have occupied three hours in passing through it (if the whole left the ground), at a velocity of 1,643 feet per minute, or 18 miles per hour, a velocity said by Mr. Smith to be the maximum, as ascertained by actual experiment. A fall of rain of two inches on 700 acres, is equal to 28 millions of gallons of water. The steep gradients of the streets, and necessarily the sewers of Birmingham, combined with occasional excessive rain-fall, demands that the main outlets for the sewerage water should be capacious, and of superior workmanship, both of which are found in the new sewers of Birmingham; 1,374 lineal yards of the 5-feet 9-inch sewer has been executed at a cost of 3*l.* the lineal yard complete, also 4,755 lineal yards of 4-feet 6-inch sewer, and 486 lineal yards of 3-feet 6-inch sewer; all in brick set in lias lime; and the form egg-shape in section. Of earthenware glazed pipe, 1 foot 3 inches in diameter, 346 lineal yards; 541 lineal yards of 12-inch, and 489 lineal yards of 9-inch, making in the whole a total of 4½ miles and 71 yards, laid at a minimum depth of 14 feet. These sewers have flushing apparatus, side entrances, ventilators, gully-mouths, and stench-traps. The cost of these sewers and drains has been about 27,000*l.*, towards which the railway Companies have contributed 17,000*l.* or more than three-fifths of the whole. This large amount was obtained from the Companies under the powers of a clause inserted by the Commissioners in their Bills, making it compulsory on them to construct at their own expense, whenever they interfered with the then existing drainage, a new sewer, not only to act as a substitute for the drains disturbed, but to be formed in accordance with the plans of the Commissioners. The evidence states,—

“These requirements were acceded to after much discussion, and the strenuous efforts of the Commissioners in Parliament, and they have since been liberally carried out by the respective Companies.”

WATER SUPPLY.—Birmingham is at present imperfectly supplied with water from several independent sources. 1st, The stratification of the district is full of water, and consequently private wells and pumps are constructed very generally. 2nd, There are several public wells or pumps in the town, from which the water is obtained by the neighbouring inhabitants; and 3rd, many private water carts traverse the town, from which it is purchased by the cottagers at an half-penny the can full; or about three and a half gallons; and 4th, there is a public company supplying portions of the town three days in each week, with about one million gallons a-day.

There may be advantages in a district, where the subsoil is porous, as found on the new red sandstone districts generally, and in thinly peopled districts it may be highly desirable to have water easily obtained; but when such a district becomes crowded with inhabitants, streets, middens, cesspools, and grave-yards, as all large towns are, then an open subsoil, full of water, is rapidly converted into a dangerous nuisance. The infiltration from every source of impurity, passes into the sand and gravel, and all the water drawn from such strata, is of necessity impregnated with the offensive matter. Many of the wells now in existence in Birmingham, when first made, yielded comparatively pure water, and it was used for drinking, and all other purposes, but at present this water can only be used for washing and scouring; the supply for cooking and drinking has to be drawn from some other source, namely, the public pump, or water cart. The public pump yields identically the same water as the private pumps, only it may be drawn from a lower depth, and the "quick draft" of a more constant pumping does not allow it to stagnate in the well, and this gives it the appearance of greater purity, although in reality the same water. The bright appearance of water is no test of its purity, it is the chemical analysis alone which will reveal true results. Dr. Robert Angus Smith, of Manchester, analysed upwards of 90 of the wells in Manchester, and found all, more or less, impregnated with the impurities above named, some of them, from within the vicinity of the grave-yards, most offensively so. The stratification of Manchester and Birmingham are identical.

The supply from public pumps and water-carts, is most extravagantly expensive, if even the water was pure. One half-penny for four gallons, is 10s. 5d. for 1,000 gallons; a proper scheme of water-supply can furnish 1,000 gallons for less than 3d., or 41 times cheaper than the carts; there is also the cost of pots or cans to hold it for use; and not the least disadvantage arising from this mode of supply is, that water kept for a few hours, exposed to the atmosphere of a dwelling-house, im-

bibes all the deleterious gases of the district, and rapidly becomes unfit for purposes of household use and drinking. The supply from wells and pumps is also most expensive. It was given in evidence that a well and pump would cost about 25*l.* complete, and about 10*s.* annually to maintain and keep it in repair, or the account would stand as under :—

	£.	s.	d.	
20 <i>l.</i> first cost of pump, at 5 per cent.	1	0	0	per annum
Repairs	0	10	0	,,
Or per annum for one pump, the sum of	1	10	0	

To this may with fairness be added the labour of pumping and fetching the water, the use and wear of cans and pots to hold it, and we shall have an annual outlay for one pump, of not less than 2*l.* This would give a constant supply of pure water to eight houses, of 100 gallons a day to each house. The water would be pure, ready at hand, and the supply constant. To have a pure supply insured, is of vast importance, as there is a liability on the part of persons imperfectly supplied, and who have a vitiated source at hand, to make use of it, to the serious injury of the health of themselves and their families. This vitiated water frequently, when used, produces dysentery and death.

WATER WORKS COMPANY.—This Company was incorporated by an Act of Parliament, 7 Geo. IV., cap. 109, obtained in the year 1825. The capital of the Company under their Act of incorporation is 120,000*l.* raised in shares of 25*l.* each, with power to raise 30,000*l.* additional if required. The principal reservoir is situated at Aston juxta Birmingham, and the water is admitted into it from the river Tame; the area of this reservoir is about 747,000 square feet; there is no filter bed, but the water passes through large canvas strainers, which can be removed for cleansing. This reservoir was constructed in 1831, and it has been twice cleaned out since it was opened. Near this reservoir two lifting engines of 90-horse power each, force the water into an upper reservoir, situated to the west of the town, and which is at an elevation of 252 feet above the river, which commands the greater portion of it. All the conduit pipes are of iron; the small service pipes are of lead; and most of the cisterns are lined with lead. Supply, as previously stated, intermittent, on three days in the week. About one-third of the town was supplied.

Analysis.

Temperature on the 25th of August, 1843 = 60° F.

Specific gravity 1000·68.

100 parts of the solid matter obtained by evaporation consisted of chloride of calcium, with traces of magnesium	11·42
Sulphates of lime and soda, with traces of sulphates of magnesia	37·14
Carbonate of lime	45·24
Silica, with a slight trace of organic matter	6·20
	100·00

(Signed) GEORGE KEMP, M.D.,
Professor of Chemistry,
Birmingham.

COMPARISON of RATES allowed by Birmingham Water Works Act, and those actually charged by the Company.

Rent of Dwelling not exceeding.	Rate allowed by Company's Act.	Per Annum.	Rates fixed by Company not to exceed.	Remarks.
£.	£. s. d.		£. s. d.	
10	1 0 0	15s. 12s. 11s. 10s. 9s.	..	And where there are several, 10 per cent. off, and in very poor neighbourhoods more.
20	2 0 0	. . .	1 8 0	
30	2 16 0	. . .	1 17 0	When farmed by landlord, empty or full. 20 per cent. off for a term of 7 years.
40	3 15 0	. . .	2 0 0	
50	..	. . .	2 10 0
60	5 0 0	. . .	3 0 0	
70	..	. . .	3 10 0
80	5 12 0	. . .	4 0 0	
90	..	. . .	4 10 0
100	6 5 0	. . .	5 0 0	

In principal streets, where the shop fronts add to the value of the house, the rates, and not the rack-rent, are taken as the guide for the scale.

The following is a table of the specific gravity of some of the public wells in Birmingham.

Name of Well.	Specific Gravity.
Lady Well	1000·403
Digbeth	1000·480
Jamaica-row	1000·520
Allison-street	1000·570
Distilled water being	1000

The water from the well in Jamaica-row, contains no trace of sulphates in its ordinary state.

(Signed) GEORGE KEMP, M.D.,
Professor of Chemistry.

REMARKS ON ANALYSIS OF WATER.—The following most able and elaborate analysis and report from Dr. Clark is of the utmost importance and value to the inhabitants of Birmingham. It will be seen that all the waters now in use are hard to excess, No. 1, from the Water-works Reservoir, also contains insects (monoculi); Nos. 4 and 5, from pumps, are both exceedingly hard, as are those from Lady Well and the pump near St. Martin's Church, Nos. 2 and 3. The specimen No. 0 is from the Lickey Hills, near Bromsgrove, which is the district named by Mr. Pigott Smith as the most desirable source for the future full supply of the town. The use of this water would save a vast sum of money in soap alone:—

In the use of 100 gallons of water from the		30 ozs. of soap is
Water Works Reservoir	}	destroyed.
Ditto ditto from Bromsgrove only	7	,, ,,
Difference		23 ozs.

Or nearly 1½ lbs. of soap gained or saved.

If 500,000 gallons of this water is used for washing in one day, and soap is charged at 4d. per lb., the saving will be 125l.; and this, multiplied by 300 days in the year, gives an annual saving of 35,500l.; or the people of Birmingham now expend 6d. extra in the use of each 100 gallons of water more than they would have to pay, if a water as soft as that from the Lickey district was supplied to them. This is, as shown, an annual sum to the whole population of 35,500l. for purposes of washing alone. But hard water is destructive of much more than soap; it is destructive of clothes in washing, and is also most wasteful in making decoctions and infusions, such as brewing and making tea; hard water is especially destructive to steam boilers, by furring them over and causing "burning" to the boilers and also waste of fuel; and as Dr. Clark intimates all high pressure boilers are more liable to explosions and accidents from being furred with hard water.

The direct and indirect saving to the inhabitants and manufacturers of Birmingham, if fully supplied with a water of 2.5° of hardness, in place of one of 13.25°, would probably not be less than 70,000l. a-year. The benefit to health, and increase in comfort, would also be very great.

NOTE.—I have given the analysis of Professor Kemp, which was furnished to me by the Company, but this analysis by Dr. Clark will show how necessary it is to give more than the mere specific gravity to test fully the properties of water.

NOTE ON SIX SPECIMENS OF WATER FROM BIRMINGHAM, by T. CLARK,
Professor of Chemistry in the University of Aberdeen.

GENERAL TABLE OF RESULTS.						
	100 Gallons require of Curd Soap, in order to form a Lather,	Actual Hardness.	Latent Hardness.	Total Hardening Matter.	Fur Deposited on Boiling, in Grains per Gallon.	REMARKS.
No. 1. From Reservoir of the Birmingham Water Works Company at Aston.	oz. 30	13.25° +	0.9° =	14.15°	6.4	This water had insects (monoculi) swimming in it.
After boiling	19 $\frac{3}{4}$	8.25° +	0.0° =	8.25°		
No. 2. From the Lady Well	20	8.3° +	8.5° =	16.8°	8.0	
After boiling	20 $\frac{3}{4}$	8.7° +	0.3° =	9.0°		
No. 3. From the pump in Digbeth, beside St. Martin's Church.	23	9.8° +	0.5° =	10.3°	5.0	This water had a whitish film on the surface, and a slight milky tint diffused throughout it; these, careful filtration removed.
After boiling	13 $\frac{3}{4}$	5.45° +	0.0° =	5.45°		Besides having a slight milky tint, this water had whitish particles, evidently of organical origin, diffused throughout it; all which, however, careful filtration removed. The water smelled like sour dough, or like a porter cellar, and had a corresponding taste. There was free acid in this water, over and above the carbonic; probably the acetic.
No. 4. From Bromsgrove	7	2.5° +	0.0° =	2.5°	0.0	This water smelled of mineral oil, somewhat like coal gas.
No. 4. From a pump, No. 3 Court, Tonkstreet, near the Inkleys.	..	..	..	45°	..	
No. 5. From a pump in the yard of the "Lamp" public house in Cannonstreet.	..	..	..	26°	..	

NOTE.—The soap necessary for Nos. 4 and 5 could not be accurately observed in the undiluted waters, on account of the earthy curd that floats on the surface, resulting from the decomposition of the soap by the excessive quantity of hardening matter present in solution.

Explanation of the General Table.

There are five columns of figures. The *first* gives the quantity of curd soap capable of forming a lather with 100 gallons of each of four of the waters. This quantity of pure distilled water takes about $1\frac{1}{4}$ oz. of curd soap. Any soap additional to this required by the several waters is owing to the presence of salts held in solution by them. The *second*, *third*, and *fourth* columns are expressed in degrees of hardness. Each 1° of hardness stands for as much hardness as would be produced by 1 grain of chalk per gallon. The *second* column gives the actual hardness; for example, No. 1 is $13\cdot25^\circ$ of hardness, that is to say, 1 gallon of it will destroy as much curd soap as a gallon of water containing $13\frac{1}{4}$ grains of chalk ($= 0\cdot3$ oz.); and a gallon of No. 2, being $8\cdot3^\circ$ of hardness, will destroy as much soap as another gallon, containing $8\cdot3$ grains of chalk ($= 0\cdot2$ oz.)

The *third* column contains what I have called the latent hardness of the water; that is to say, it represents certain degrees of hardening matter present in the water, but not brought out into action. What brings this latent hardening matter out into action is the addition of more pure water. For example, if a mixture be made of

50 gallons of water No. 2, and of

50 gallons of pure distilled water, this mixture of

100 gallons will take within $\frac{1}{4}$ oz. of 20 ozs. of curd soap in order to form a lather, which 20 ozs. is the quantity of soap that 100 gallons of No. 2 itself would take. Most of the latent hardening matter would be brought into action by this degree of dilution. But however farther diluted the water No. 2 may be made, the whole hardening matter present in the whole of the diluted mixture will never exceed $16\cdot8^\circ$. The *fourth* column is the sum of the *second* and *third* columns. To understand the *fifth* column, let it be remembered that, when certain waters boil, they deposit solid matter formerly in solution—salts of lime and of magnesia. This deposit, commonly called a fur, forms an incrustation on boilers, which occasions a loss of fuel and other inconveniences. The deposit consists of hardening matter. The *fifth* and last column contains the weight of fur thus deposited; some further information respecting which will be given in the concluding part of this note.

In general it may be stated of all the waters that they contain salts of soda, salts of lime, and salts of magnesia. The hardness of the waters is nowise dependent on the acids of those salts, but only on their bases. Salts of soda do not affect the hardness; salts of lime and salts of magnesia do; but, as far as I know at present, it is salts of magnesia alone that have the power of producing any degree of hardness capable of being latent; that is to say, of being present in a water without the power of acting fully on soap until further diluted with pure water.

Is any of these Waters eligible for the Supply of the Town of Birmingham?

Nos. 4 and 5 are altogether out of the question, on account of their great hardness. The actual hardness even of No. 5 is much above 16° ,

No. 1 is the water made use of by the Company for the supply of the town. I am clearly of opinion that although necessity may in some places justify the choice of a water of 13 degrees of hardness, yielding a fur of 6 grains per gallon, and not falling below 8 degrees of hardness, after thorough boiling without evaporation, yet the necessity where it exists, which does not seem to be in Birmingham, can never cease to be a misfortune. There will be a waste of soap, an encouragement to dirty habits,—not only clothes less frequently washed, but clothes more subjected to wear and tear in the washing; there will be a waste of tea, a difficulty of cooking such articles as peas, the kitchen boilers will be furred, the steam-boilers will be furred, and probably explosions in steam-boilers will be more frequent.

It is doubtful whether No. 2 would be a better water than the water of the Reservoir. No. 3, however, probably would be a better water, but not so good as is desirable; or as is attainable, too, I doubt not, if due diligence be given to find good water within reach of Birmingham.

With regard to No. 0, (the specimen from Bromsgrove), let it be observed, that it is a specimen, and not the water itself, that is before me. How, therefore, the organic matter it manifestly contains—how the free acid and the smell and the taste that contaminate it, got there, or whether it can be kept free from those contaminations—I cannot tell. These are points that must be determined by some competent observer on the spot. I have no hesitation in saying, that a water so soft as this is, and yielding no sensible fur, would, were it free from contaminations, be a blessing to the town of Birmingham.

Comparing Nos. 1 and 3, which resemble each other, with Nos. 3 and 0, which are very different from each other and from those, it is plain that Birmingham and its neighbourhood affords several varieties of water, the characters of which should be fully known, before any one water is selected finally for so important a purpose as the supply of the town of Birmingham; and I hold it to be one of the plainest maxims of prudence in the selection of a water for a town that the choice should be made, in respect of the quality of the water, so advisedly that no better is likely to be procured from any other source for more than a hundred years to come. When a wrong choice is made at the outset, every after expense in carrying out the plan, is less a correction than an aggravation of the first error.

Effects of Boiling on Nos. 1, 2, and 3.

I conclude by presenting some of the numerical particulars of my experiments on the effect of boiling.

Respecting degrees of Alkalinity, it is necessary to premise, that for each "degree of alkalinity" that a water is found to contain, a-gallon of it will neutralize as much sulphuric, or nitric acid, as one grain of chalk would neutralize.

—	Actual Hardness.	Hardening Matter.	Alkalinity.
	o	o	o
No. 1	13.25	14.15	8.9
After boiling . . .	8.25	8.25	4.3
Difference		5.9	4.6
		4.6	
		<u>1.3</u>	
Lost in alkaline earthy salts . .		4.6	
Lost in neutral earthy salts . .		1.3	
Lost in alkaline and earthy salts } together		5.9	

Calculating the alkaline earthy salts as carbonate of lime, and the neutral earthy salts as sulphate of lime, (by an increase of 36 per cent. on the degrees of neutral earthy salts deposited), we have as the fur deposited by a gallon—

	Grains.
Carbonate of lime	4.6
Sulphate of lime	1.8
	<u> </u>
Total	<u>6.4</u>

In like manner—

—	Actual Hardness.	Hardening Matter.	Alkalinity.
	o	o	o
No. 2	8.3	16.8	11.35
After boiling . . .	8.7	9.0	4.15
Difference . . . . .	..	7.8	7.2

Hence, as before, the fur is per gallon—

	Grains.
Carbonate of lime	7.2
Sulphate of lime	0.8
	<u> </u>
Total	<u>8.0</u>

—	Actual Hardness.	Hardening Matter.	Alkalinity.
	o	o	o
No. 3	9.8	10.3	7.55
After boiling . . .	5.45	5.45	3.2
Difference . . . . .	..	4.85	4.35

Hence, as before, the fur per gallon is—

	Grains.
Carbonate of lime	4·35
Sulphate of lime	·68
	<hr/>
Total	5·03
	<hr/>

True, a portion of the salts deposited may be salts of magnesia, but the difference of weight that would occur in the fur would be unimportant in any practical point of view.

THOS. CLARK.

17, *Bryanstone-street, Portman-square,*
June 13, 1849.

The advantage of an abundant supply of water is very great as regards the cleanliness and comfort of all streets and roads, and it is most important that it should be cheap, or the necessary supply may be very injuriously limited. The cost of watering the streets of Birmingham is excessive. There are about 23 water-carts used for the streets and roads, each of which will hold 330 gallons: for this quantity the Company charges 1s., or rather more than 3s. each thousand gallons. In the year 1848 very nearly 8,000,000 of gallons were used during the season; the actual number of loads used were 24,153, or 7,970,000 gallons, costing 1,576*l.* for water alone. The surveyor states, “although the amount may appear large, there is great economy in its use, inasmuch as it saves the wear and tear of the roads.” A full supply of water may be given for 3*d.* a thousand gallons, or one-twelfth of the present cost, to the rate-payers. The indirect saving to the shopkeepers of a full and cheap supply would be very great, as those who necessarily have their goods exposed perfectly understand clean streets can scarcely be valued too highly.

CHALYBEATE SPRING.—A short distance from Birmingham, in the manor of Duddeston, and joining the turnpike-road to Coleshill, in the time of Hutton there existed a chalybeate spring, whose water, he quaintly remarks—

“Has but one defect,—it costs nothing. This excellent spring lies forlorn, neglected, and exposed to every injury; it seems daily to solicit protection, and offer its friendly aid in restoring health: but being daily rejected, it seems to mourn the refusal, dissolve itself in tears, and, not being allowed, though designed by nature, to increase the health of man, moves weeping along to increase a river. Had this water passed through a bed of malt, instead of mineral, it would have drawn more attendants than the shrine of Thomas à Becket. Poverty assumes a variety of shapes; but in whatever form it appears it is always despised. The low state and the low credit of this well are equal.”

I wrote to the town-clerk to inquire what had become of this spring, and his answer is as follows:—

“The chalybeate spring in Duddeston was turned into a culvert by the railway people when the Birmingham and Liverpool Railway was constructed, and consequently no water can be obtained from it. The inhabitants in the neighbourhood very much regret the loss of this water, and speak strongly of its virtue in diseases of the eye.”

Surely some of the benevolent and liberal gentlemen of Birmingham may be found to restore this valuable water to the use of the district for its own sake, and also for the sake of the historian of the town, its eloquent advocate, who says of it—

“Merit is often depressed. Here the afflicted might find a prescription without expense, efficacious as if signed by the whole College of Physicians. The stick and the crutch would be nailed round its margin, as trophies of victory over disease.”

A comparatively small outlay would not only restore this well to public use, but would also erect a neat structure over it, in which baths might be provided, and the whole might be called the HUTTON BATHS, after the benevolent, earnest, and most eloquent advocate of this spring. There is a debt of gratitude yet due from the people of Birmingham to the memory of Hutton for his History and his labours in their Court of Requests; and his calm spirit would rejoice more in one small work of true utility than in the most gorgeous monument ever erected to man, if it only served the purpose of ostentatious ornament. But the use of this water might also serve the purpose he contemplated when he wrote in his chapter on this well:—“The use of the bottle adds to the spirits, but shortens life: THIS FOUNTAIN IS THE RENEWER OF HEALTH, THE PROTRACTOR OF AGE.” This might be the motto; and then comes comfort for the teetotaller: “I remark that the water will lose some of its efficacy if carried off in any vessel but the stomach.”

It is a difficult matter in this country to find a source of water supply unappropriated; real or imaginary rights are asserted to all that flows over the surface or rises in springs; and should any portion be required for sanitary purposes it too frequently happens that an extreme bargain is driven for it. There is, however, one feature in the case, where any supply is given to a town, which must not be lost sight of if a river or stream flows through it. Those parties below can only be injured to the extent of one-seventh the quantity of water taken, as six-sevenths find its way back into the stream; and if used for water-power alone the injury can only amount to this extent.

Some years ago water was required for the supply of Bolton, which in its natural channel flowed down into the Bridgewater

canal; but Lord Ellesmere willingly gave up all right to it on the single condition, that the waste water should be passed into its natural channel.

One person alone appeared at the inquiry in Birmingham on this question, and I have given his evidence:—

Mr. Edward Rollinson:—

“ I live at Erdington, in the parish of Aston. I am the owner of Bromford Mills, and a shareholder in the Water Works Company. I have gauged the stream in a very dry summer, and find that the minimum flow is about 28 millions of gallons per day. I mean to say, that more than 32 million gallons per day can be made available for the Birmingham supply. The Act of Parliament says, that both the river Thame and the Hawthorn Brook shall be available, and the brook will bring about four million gallons per day. Why I know it is, that I was born and bred and live upon the spot; the stream runs over a wear, and I gauged the wear. There are several rights on the stream below where the supply is taken for the town of Birmingham; mine is the first right, Lord Bradford has two rights: there are two belonging to the Forge Mills and one to Mr. Kintrea. The refuse water from the town again runs into both rivers; all the water each way for 10 miles comes down to my mill; and I should say, that the actual loss and waste which does not run back into the stream is about equal to one day's consumption a-week, or one-seventh.”

The Company in the first instance paid as a money compensation for the use of the water abstracted from the river 6,705*l.*, and supposing one million gallons a-day is pumped up and supplied to the town the actual abstraction does not amount to more than one million gallons a-week, and consequently this sum of money has been paid not for the larger quantity, as was supposed, but for the smaller or one-seventh. This river is used to work undershot-wheels, and for purposes of irrigation. The whole tenure of the evidence given by this witness was, that there was an abundance of water in the streams which might be taken for the town; that there was a minimum supply for the use of his mills, and that consequently he must have a good price for all taken. I pressed him very closely upon the estimate of quantity, as, although I had not seen the streams, I felt tolerably sure that from the elevation and central position of Birmingham such a volume of water was not a probable quantity. On the second day the witness returned to state that he had made a “slight mistake,” as the minimum quantity of water flowing down the river was 18 millions of gallons, and not 28, as previously asserted; but this quantity is excessive: from such observations as I was enabled to make upon the stream, I am decidedly of opinion that the minimum flow must be under 10 millions of gallons a-day.

EXISTING BATHS.—There are several public baths in Bir-

mingham. The baths at Lady Well Spring are 19 in number, and have cost about 4,000*l.* There are private baths, warm and cold, and a swimming bath, upwards of 100 feet long and 50 feet wide. These springs formerly supplied about 1,000 hogsheads of water per hour; but some deep sewers recently made in the neighbourhood are said to have diminished them.

Baths, George-street, Balsall Heath.—These baths were opened in 1846 by Mr. John Smith. They are situated in a most salubrious atmosphere, and have a continual supply of pure water.

The town authorities contemplate erecting additional baths and wash-houses; and the experience of those towns in which such have been brought into use is most gratifying and encouraging.

The experience of the great benefits derived from such establishments in Liverpool is shown by the last returns of the baths and wash-houses for the quarter ending the 24th May.—*Paul-street*: 1,183 cold, and 9,817 warm baths; receipts, 143*l.* 16*s.* The children of various schools, with their teachers, inspectors of nuisances, &c., to the number altogether of 19,139, had gratuitously bathed; 20,512 dozens of clothes had been washed, yielding 56*l.*, and making the total receipts of the quarter 200*l.* *Frederick-street*: 1,498 cold, 4,750 warm, and 108 vapour baths; the total number paid for being 6,346, and the receipts 85*l.*: bathed gratuitously 6,361; dozens of clothes washed 10,352, yielding 21*l.*, and making the total receipts 106*l.* How much benefit has been derived by the 6,361 persons who have gratuitously bathed it is impossible to say, and, consequently, the money value of these establishments is no test of their true utility. I would again quote Hutton, who says—

“The knowledge of this singular art of healing is at present only in infancy. How far it may prevent or conquer disease, to what measure it may be applied in particular cases, and the degrees of use, in different constitutions, are inquiries that will be better understood by a future generation.”

When a full supply of water has been provided, baths, private and public, will become general; the form, arrangement, and size of private baths for the wealthy may be left to private enterprize; but as the poorer inhabitants can only use cheap structures, hints for their general arrangement may be useful.

Hutton remarks, “The gloomy horrors of a bath sometimes deter us from its use, particularly if aided by complaint;” but there is another extreme also to be avoided, namely, lavish ornament. It has been said, we build palaces for criminals and paupers, and some of the recent public baths and wash-houses present a regal outside. Works and buildings of stern utility ought to be in appearance plain and simple. The ex-

ternal decoration of many modern public buildings might have been spared, and the cost of it added to internal space and comfort.

The situation for public baths should be pleasant and airy, the rooms should be well lighted and ventilated, and the walls formed with material not readily dirtied, and which, when so dirtied, may be soon cleansed. The walls may be constructed of hollow tiles, or hollow bricks, having, as recommended by Mr. Chadwick, an earthenware glaze on their inner face, the colour of which may be pleasingly varied; the floors may, with great advantage, be of the same tile, perforated, to allow the water to run freely off from the feet.

The furniture of the bath-rooms should be plain and simple; wood or cane-bottomed chairs, with fixed dressing-tables of slate, stone, or earthenware, should alone be used: 1,000 gallons of water may be furnished for 3*l.*, and this would afford 20 baths, allowing 50 gallons to each bath. The supply of water, therefore, for each bath would not cost more than one farthing.

The true secret of the bath is always to have the power of entire ablution at hand; each person may have the means of cleanliness within his own home, and this may be very cheaply provided. The superior artizan of Birmingham may, for an expenditure of 5*l.* provide a private bath in his own house, furnished with hot, cold, and shower bath. This would resolve itself into a rent-charge of 5*s.* a-year, or about 1*d.* a-week; But including rent-charge for water, additional fuel to heat the water, and repairs, such a bath, if used cold every day, and warm once a week, would not cost more than 10*d.* a-week. Each cottage may have its own bath at a first cost, not exceeding 1*l.*, which, at 5 per cent., is a rental of 1*s.* per annum, or less than one farthing per week. The bath will be compact in form, and may be made of brown earthenware, either in one piece or in slabs, and jointed; there will be no extra cost for drainage or water supply beyond the connexions with the bath. A distinct and separate bath room need not exceed in its internal dimensions 6 feet by 4 feet 6 inches, and 7 feet in height, and this may contain a bath for hot and cold water to afford complete immersion, and shower bath, as also a water-closet. The slipper bath should occupy one side of the six feet length, and may be 2 feet 3 inches in width; the shower-bath can be fixed over one end of it with an oil-cloth screen in front; the water-closet may be placed at the end where the shower-bath is fitted up, so as, with the breadth of the bath, to occupy the whole width of the room at that end; the door into the room will be opposite the lower side of the bath, and a small window may be made opposite the door over it. For means of ventilation a slit opening should be provided in the ceiling betwixt the wall and its usual junction; this need not

be more than one-eighth of an inch in width, but should be carried entirely round the room and communicate with an external opening or flue. Hollow tile may be made to answer this purpose to perfection. A similar opening may be made round the floor, and all water-closets, wash-houses, and bath-rooms should have some such means of ventilation. The more general and simple the arrangement is, the more efficient and useful will its action be.

The bath-room and water-closet I have described is not a speculation as to what may be done, but it is a thing accomplished in a private house, and the baths have been in constant use upwards of ten years.

GAS WORKS.—The following is a return from the Birmingham Gas-Light and Coke Company:—

“ In December, at the time of the greatest demand, the Company had 244 retorts in use.

“ The number of gas holders is 10, and their working capacity is 870,000 cubic feet.

“ The total quantity of gas, generated at the Company’s three stations in 1848, was 145,000,000 cubic feet.

“ N.B.—The Company have an additional retort house ready for 100 retorts; and if wanted, could in a few months erect an additional gas holder, capable of containing 370,000 cubic feet, the land and station being held quite ready for such extension.

“ The Company contracts with the Commissioners of the Birmingham Street Act for 805 public lamps, all using batwing burners, and consuming upwards of 5 cubic feet each per hour, lighted every night throughout the year. For these 805 lamps, the Company receives a gross price of 70s. per lamp per annum.

“ The Company finds all the fittings for the said lamps, exclusive of the pillars, which are the property of the Commissioners; and the price includes lighting, extinguishing, and keeping the lamps in repair; leaving a nett produce to the Company of 2s. 4½d. per 1000 cubic feet.

“ The prices of gas to the private consumer are as follows:—

1st Scale, determinable by quarter consumption.

	s.	d.	
Under 5,000 cubic feet	6	8	per 1000 cubic feet.
5,000 feet and under 25,000 cubic feet	6	0	,,
25,000 ,, 50,000 ,,	5	0	,,
50 000 ,, 100,000 ,,	4	9	,,

2nd Scale, determinable by annual consumption.

	s.	d.	
100,000 feet and under 200,000 cubic feet	4	6	per 1000 cubic feet.
200,000 ,, 400,000 ,,	4	3	,,
400,000 ,, 600,000 ,,	4	0	,,
600,000 and upwards	3	9	,,

“Each scale and all the prices subject to an uniform discount of 10 per cent. if paid in cash during the succeeding quarter; and in all cases the Company supplying meters of the very best description, and made by the most correct manufacturers, free of any charge whatever. The cost of meters is peculiarly heavy upon the higher prices and smaller quantities; thereby accounting for a difference which would otherwise seem disproportionate.

“(Signed) JOSEPH HARRISON,
“Clerk to the Company.”

The Birmingham and Staffordshire Gas Company also supply a portion of Birmingham. This Company was established by Act of Parliament in the year 1825, 6th Geo. IV., c. 79, and had their powers enlarged in 1845, 8th and 9th Vict., c. 66.

Works.—The number of retorts are 176, ovens 138; the number of gas holders 14, and their capacity one million of cubic feet. The greatest annual quantity of gas generated in one year was 216,000,000 of cubic feet. The number of public lamps lighted by this Company within the borough are 1,280, the kind of burner used a batswing, consuming upwards of 5 cubic feet per hour; the price charged is 70s. per lamp for being lighted every night throughout the year, which, after deducting the expense of cleaning, lighting, extinguishing, and keeping in repair, leaves the nett amount received by the Company 52s. per lamp, or a fraction more than 2s. 4¼d. per 1000 cubic feet; in one district of the borough the lamps are lighted only on 274 nights during the year, for which the Company receive 60s. per lamp, subject to the above deductions, which reduce them to the nett amount of 42s. each. The Company find the lamps and fittings.

The Company have two stations, one in Birmingham, the other in Westbromwich; the one in Birmingham is situated in Adderley-street, near the Coventry-road, and is distant from Nelson's monument about three quarters of a mile. The other station is on the Dudley-road, about a quarter of a mile from its junction with the Wolverhampton-road, and between six and seven miles from Nelson's monument.

The Company have another tank made ready to receive a gas-holder, capable of storing 230,000 cubic feet, and the works in every respect are capable of being greatly increased.

SCALE OF CHARGES FOR QUARTERLY CONSUMPTION.

	<i>Per Quarter.</i>	<i>s.</i>	<i>d.</i>	
100 cubic feet and under	5,000	6	8	per thousand.
5,000	25,000	6	0	„
25,000	50,000	5	0	„
50,000	100,000	4	9	„

subject to the bonus of 10 per cent. for quarterly payments in cash.

SCALE OF CHARGES FOR ANNUAL CONSUMPTION.

	s.	d.	
100,000 cubic feet, and under 200,000	4	6	per thousand.
200,000 ,, 400,000	4	3	,,
400,000 ,, 600,000	4	0	,,
600,000 cubic feet and upwards	3	9	,,

subject to the usual bonus of 10 per cent. for quarterly payments, in cash.

When the quantity consumed in any quarter is less than 100,000 cubic feet, the same will be charged according to the quarterly scale of prices, and a drawback will be allowed in the succeeding Christmas quarter upon all accounts so charged which shall be found to have exceeded 100,000 cubic feet in the year; commencing with the first day of July last.

Scale of charges for public lamps, each 1,000 cubic feet, 2s. 4½*d.*, or 4s. 3½*d.* less than is charged to the small consumers, and 1s. 4½*d.* less than is paid by the large consumer.

With all the advantage of cheap fuel near Birmingham, and large consumption in it, 6s. 8*d.* must be considered an excessive charge, and there is every reason to believe that a wise reduction to one uniform rate would very much tend to increase the consumption, and even bring the Company's profits up to their present standard. The rate has been reduced in Whitehaven from 8s. to 4s. each thousand feet, with singular advantage, alike to the Company and to the consumer. It has taken away from the latter a just cause for complaint, and it has, by the great increase in consumption, almost brought up the dividend to 10 per cent., and it has also put an end to rivalry which the excessive charge would inevitably have brought about. The history of this Company is instructive in the reduction of rates:—

	s.	d.	
In 1830, the rate was	12	6	each 1,000 feet.
Reduced to	10	8	,,
Ditto	8	0	,,
Ditto	4	0	,,

or more than 300 per cent. from the first charge, and the chairman stated, that the last price would soon produce their dividend of 10 per cent.

The two Companies at present supplying the town must necessarily increase the expense, as there are two separate establishments, with distinct offices, and two sets of mains. The inconvenience to the inhabitants will also frequently be doubled, as some streets will be twice broken up where once would have served. Unity of works and of management is most desirable for efficiency and economy.

BURIAL-GROUNDS AND CEMETERIES.—Like most other towns in a Christian country, the old grave-yards of Birmingham are

attached to places of worship. These old grave-yards are full to repletion, and almost every square yard of their surface is covered with a stone, or bears evidence of a grave. In the centre of the town, and within the compass of a square mile, are the churches and burial-grounds of St. Philip's, St. Paul's, St. Mary's, St. Bartholomew's, St. Martin's, and Park-street. The area of the ground thus situated is about 12 acres; on the outskirts the churches of St. George, All Saints, and Trinity Church have burial-grounds, all of which may be considered full, with the exception of All Saints. Most of the Dissenters have grave-yards attached to their several places of worship, and some of them inter within the walls. St. Philip's Church stands near the centre of the town, and the grave-yard surrounds the church, and is itself entirely surrounded with houses. This yard has been partially closed, and it certainly should be closed entirely as soon as possible, as the effluvia from the yard and graves is said to be very offensive to the surrounding neighbourhood, especially in the summer months; the surface of this yard has been considerably raised by the vast number of interments which have taken place there. It has been in use upwards of 120 years. There have been at times 900 burials in one year. St. Paul's Church and burial-ground is also entirely surrounded with houses; it has been in use about 70 years; it is near $2\frac{1}{2}$ acres in extent, and there have been as many as 600 burials in a year. St. Mary's Church and burial-ground is also closely crowded round with dwelling-houses, and the ground is said to be wet. It has been in use for 70 or 80 years, and the burials have exceeded 700 in the year. The ground is about three acres in extent, and has been partially closed. The grave-yard of St. Martin's Church in the old market-place has been entirely closed. St. Bartholomew's and Park-street burial grounds are most unfavourably situated; they are in the lowest part of the town, and are surrounded by a population of the working-classes densely crowded. Both these grave-yards are very full; the chapel-yard has been lately used for the pauper burials, which are made a less depth than ordinary graves, not more than 4 feet. The area of both grounds is about five acres; they have been in use from 70 to 80 years, and the number of burials has probably exceeded 1,300 a year. The number of burials which have taken place in these several churchyards has exceeded 3,500 during the last 12 months.

As stated, these grave-yards are situated within the heart of the town, built in on all sides, so that any effluvia or evaporation that arises, must inevitably be carried upon and through those dwelling-houses situated on that side the wind is blowing towards; the effect such a tainted atmosphere has upon health is well known; many of these yards have public foot-walks through them.

In none of these burial-grounds are there any plans kept of the yard, on which to show the progress of interment; and consequently one sexton has no means, but the appearance on the surface, to ascertain where former burials have taken place; and as the ground is trodden down by children's feet, or levelled by other means, it is impossible even for the same sexton to ascertain the precise position of his former interments; and he consequently uses that revolting implement the "boring-rod," and even then, according to the testimony of every sexton examined, graves are frequently disturbed in which half decayed bodies are exposed.

The practice of burying within the walls, as in some of the chapels and churches, is most offensive, and highly dangerous to health. Two public cemeteries have been established in Birmingham, on the north-west side of the town; one is not incorporated or consecrated; it occupies about 12 acres of ground; six of which only are in use for cemetery purposes. The Church of England cemetery adjoins the other; it was established by Act of Parliament in 1846, and was opened and consecrated for general use in the autumn of 1848. The whole extent of the land is about 11 acres, of which 9 are laid out for burials. There are catacombs and vaults calculated to hold many thousands.

There is in these two cemeteries an uninterrupted extent of area of about 23 acres. In each a regular plan for interments is followed, and each grave is numbered; and a correct register is kept, of which the following is a copy, abstracted from the Register Book:—

Copy of the FORM of the REGISTER BOOK of INTERMENTS kept at the BIRMINGHAM GENERAL CEMETERY.

No. of interment.	Running No.	Section No. of Grave.	Depth. Feet.	Name of Deceased.	Parents' Name, Relative, or principal Connexion.	Last Residence.	Age.	Disorder.	Officiating Minister.
15	6512	481 } 482 } Q	18	Edward Timms.	Thomas Timms.	New Summer-street, Manchester-place, 11 Ct. 3 Ho.	17	Phthisis.	Bernard Ivers.
	6513	55 D	16	Charles George Foster.	Elizabeth Blancy.	Spring-street.	W. D. 1 5	Erysipelas.	Peter Sibree.
	6514	12 E	8	Richard Whittell.	Thomas Haywood.	3, Old Meeting House-yard, Deri- tend.	M. 7	Marasmus.	Peter Sibree.
	6515	957 K Re- opened.	12	Francis Owen, Clark.	Francis Clark.	Hazelwood House, Edgbaston.	20	Phthisis.	Samuel Baché.

The situation of both these cemeteries is immediately outside the thickly built portion of the town, they occupy the side of a hill, and the subsoil is sand, gravel, and "roach," or fri-

able red sandstone rock, the grounds are beautifully laid out, and everything about them is in a clean and neat condition, offering a strong contrast to some of the churchyard burial grounds within the town, where all is neglected and wretched-looking to a degree.

ROAD AND STREET MAKING AND CLEANSING.—I would beg to direct especial attention to the streets of Birmingham, and the roads in the neighbourhood. They have been for some years under the able superintendence of Mr. Pigott Smith, the surveyor to the Commissioners, and their general state and condition is such as to merit a word of praise. The whole are Macadamized, and have for several years been cleansed by Mr. Whitworth's street-sweeping machines, 12 of which are in use; and I was informed by Mr. Smith that it would be impossible to preserve them in their present state without their aid. They are not, however, used at random, but with a degree of intelligence which insures their full efficacy. In fine weather both men and horses are worked easily, but the whole force is put on in continued wet weather; and, if need be, work, at a push, night and day. Mud is never allowed to accumulate, but is removed at once, and consequently the material of the road is preserved sound and hard. The action of the bushes tend also to preserve the road, as the hollows are passed over lightly. The good roads and streets of Birmingham owe their character entirely to machine cleansing and active intelligent management. There are no side accumulations of street mud; as in hand sweeping, or hand scraping, the machine removes all at once.

By confining the coating of streets to the months of November, December, January, and February, a good even surface is obtained, as during these months the material becomes rapidly consolidated, and during the summer months the roads presents an even and unbroken surface; few loose stones are to be seen, and in this state the streets are kept during eight months of the year, which is principally owing to the excellent working of the machines. The saving effected in the consumption of material is estimated to be fully one-fourth; the annual consumption of material for the seven years previous to the introduction of the machines was 20,000 cubic yards, and the three subsequent years the actual consumption was under 13,000 cubic yards. The total cost of cleansing for the last year, according to the accountant's return, was 1,372*l.*; a fair estimate for the whole of the borough, (with twice the number of machines) would be twice this amount, or 2,744*l.*

Watering the streets is commenced as early as necessary, frequently in March. There are in use 23 water-carts.

PUBLIC WALKS AND GARDENS.—There are no public walks,

parks, or gardens, properly so called; the suburbs are, however, most beautiful, and there are some fine sites where such might at present be cheaply provided. A few hundred acres of land bought, and judiciously laid out in a park form, might be made self-paying, if not a source of profit. Such grounds should, if possible, be to the south and west of the town, as the wind blows from that quarter nine months in the year. Several parks or recreation-grounds would be more useful than one, if they were chosen so as to be easily accessible from each part of the town.

PRIVATE GARDENS.—There are many private gardens surrounding Birmingham, and they have served a most useful and beneficial purpose; the working man has had an object of attention and care throughout the year, and if work was slack, he could find employment for a time on his own small plot of ground.

The owners of land near Birmingham deserve all praise for their wise and liberal policy in letting their land on easy terms for gardens and buildings. The system which prevails of letting it at a cheap rent is also highly advantageous, as cottages occupy more land than if there was any difficulty made about a first freehold purchase. Land in the suburbs is let at from one penny to four pence each square yard.

It does not appear that many of the trades and occupations carried on in the town are peculiarly unhealthy. There are, however, some such; as the manufacture of white lead, dry grinding in all its forms, especially pointing needles, turning pearl buttons, brass founding, and the process of lackering. All the shops and manufactories would be improved by attention to perfect ventilation, and the same plans may be applied for this purpose, as described for house ventilation. Many of the shops are small, damp, and badly glazed.

PUBLIC LODGING-HOUSES.—These must be placed under inspection and control; each room should have proper means of ventilation and the number of beds limited; a separation of the sexes should be insisted on, and every public lodging-house should be open only under the powers of a licence granted by the Local Board of Health, and certified by the Medical Inspector. At present these places are the common resort of tramps, pedlars, and pickpockets, and the rent charged is excessive, amounting to no less a sum than 20*l.* or 30*l.* a-year for one room, where many bed are crowded together, the price for each bed being 6*d.* a-night. The parties who keep these places are frequently of the lowest character, and their houses are now put to most improper uses.

SMOKE CONSUMPTION.—Perfect smoke consumption would be

a great advantage both to the manufactures and health of the town. There are numerous plans by which to accomplish this. One most efficient means has been patented by Mr. Bedington, and is carried out by Mr. S. Rawlins.

STONE, FLAGS, BRICKS, TIMBER, AND OTHER MATERIALS USED IN THE DISTRICT.—The new red sandstone of the district is not extensively used for building purposes; when first raised from the quarries, it is soft and friable in its nature. It is, therefore, not suited for house building where tenacity for bearing is required, as in window heads and sills; or where there is a great portion of the surface exposed, as in cornices and coping. Quarries of this rock have, however, been worked from time immemorial, about four miles south-west from Birmingham. Near the old castle, which castle has been built from the stone obtained there, and several modern churches in Birmingham, are constructed with the stone from these quarries, such as St. Luke's Church, in Bristol-road; St. Mark's, King Edward's-road; St. Stephen's, Walmer-lane. It must be observed, that this stone, raised in blocks, may be so worked and set; and that upon exposure to the atmosphere, it requires a hardened skin surface.

The magnificent town hall is built out of a coarse grey marble, brought from the island of Anglesea; the flags and kerbs used for foot-pavements are brought from Yorkshire, and the guard-posts at the corners of the foot-walks are also of stone from the Yorkshire quarries. Sets are brought from the Rowley Hills and Mount Sorrel for street pavements, and common lime-stone is obtained in the neighbouring iron district.

Broken Rowley rag is used for road-making, as also the broken boulders and whole gravel of the district. Clay is abundant, and bricks and tiles of a superior description are manufactured from it. Sand is abundant and cheap. The blue lias lime is used for hydraulic building purposes in the sewers and other work exposed to the action of water; it is brought from the neighbourhood of Stratford-upon-Avon. The foreign timber for building purposes is brought from Hull and Gloucester.

LIST OF PRICES.

Street posts, each 4 feet in length, and of similar dimensions in section, about 16 inches square at the ground line.

Street Posts.

	£.	s.	d.	
Cast iron	2	2	0	each set complete.
Yorkshire stone	1	8	0	, ,
Wood	1	2	0	, ,

The Yorkshire stone is found to be the most economical, and as it is worked to an octagonal section, and "tooled," it presents a very neat appearance. They are painted by contract once every year, at a cost of 1s. each for two coatings of paint.

Foot Pavements.

	Each square yard.	
	s.	d.
The best Yorkshire flags three inches thick, tooled and squared	4	3
Yorkshire stone kerb, six inches square, each lineal yard	3	6
Lias lime delivered ground and ready for use, 13s. a ton.		

Paving.

Small sets from Rowley Hill quarries, from 2 to 5 inches square, and about 5 inches deep, squared, and set complete—used for foot pavements	4	6
Mount Sorrel stone, 2 to 3 inches square, and 5 inches deep, as above—these are used for crossings	7	6
Common pebbles of the district	1	2

Channels.

Gutter stone, 19 inches wide, squared, and laid complete, at per lineal yard	3	6
Do. do. undressed, laid complete	2	6

Macadamized Roads.

	Each Ton.	
Broken Rowley rag, ready for use	6	0
Broken pebbles of the district	3	6
Gravel of the district	1	6

NOTE.—The broken stone must pass through a 2½ inch ring. A cube yard weighs about 22 cwt.

The unbroken gravel is used on outside roads alone.

BRICKS.—Best blue bricks from the neighbourhood of Oldbury, hard burned, delivered on the wharfs at 11. 10s. a thousand; common bricks made near the town 11. 4s. a thousand; these common bricks are of a very superior description, but to economise expense in building the sectional form and dimensions have been altered from the usual standard; the bricks are made shorter, narrower, and deeper, so that a wall built with them is 8 inches in thickness, instead of the usual dimensions 9 inches, and the bricks are all about 3¼ inches deep, the old form giving a depth of about 2¾ inches; or rather this may be termed the modern depth, as the bricks of the Elizabethian

period are not more than 2 inches in depth. In a district where stone is scarce, and where clay and coals are abundant, it may be well to direct attention to the capabilities of this material for building purposes, as there is scarcely any form of architectural ornament even, which may not be obtained in brick and tile-work; clay may be moulded and burned into any shape and form. Mr. Hill, the architect of the New Asylum and Gaol, has to a considerable degree availed himself of this use of the material in these structures, and with singular advantage. The usual method of cutting bricks to form an external face is most objectionable, as the fire-skin once destroyed, the power to resist the action of the atmosphere is taken away. There is, however, a growing attention now paid to this subject, as I observed a skew-bridge in course of construction over one of the new railways, the Stour Valley line, under the direction of Mr. C. Henfery, and all the face bricks in the arch had been cut off to the proper angle at the brick-yard, when the clay was partially dried, and before burning by this means saving an expensive variety of moulds, and avoiding the equally expensive and more objectionable practice of cutting. In Staffordshire I also observed that bricks were moulded purposely for window-heads of cottages, giving strength and regularity of form. To mould and use bricks and tiles for purposes of ornament and use is not a thing to speculate about; many ancient examples are found in the Elizabethian structures of this country, where quoins, gables, cornices, and clustered chimney shafts are not only formed of bricks and tiles, but have their peculiar ornaments and characteristics of architecture moulded in the material. There are old cornices of plain and moulded bricks at the Campo Santa of Rome; the church of San Giorgio in Velabro, Rome; the church of San Stephano, Ferrara; Santo Stefano, Venice; the Great Hospital, Milan; the church of the Servi Bologna; and many other examples. Drawings of these named may be found in the second part of the Architectural Publication Society's work, published this month, May, 1849.

Not only may solid bricks and tiles be used for purposes of ornament and utility to an extent not recently carried, but the application of machinery to grind and temper the clay, and to mould and compress it, will give the means of producing forms adapted for uses of various kinds highly advantageous. Mr. Chadwick has paid much attention to this subject in an economical and sanitary point of view, and has directed attention to the great advantages hollow bricks have over the solid form. He says—

“ If we suppose that improvement were to stop at the adoption of constructions of hollow brick, made of the common sizes and shapes, so that they might be worked by the common bricklayers without change

of their practice in any other respects, the gain would be considerable in getting rid of a large proportion of the absorbent qualities, and the damp incident to the use of common bricks, apart from the gain in the more economical manufacture of the hollow bricks.

“ There appears to be no reason to doubt that all the observations which we have collected, in respect to the superior warmth of double walls, and of walls made hollow as described by means of half-bricks, of battened walls, and of hollow walls of wainscot, will be found applicable to walls of the proposed hollow-brick construction. In reducing the amount of heat requisite to repel extraneous damp, we economise the labourer's fuel, in other words, increase its power and his means of comfort.

“ Suppose the walls of a cottage constructed 9 inches thick with 9-inch hollow bricks, the possible absorbent power of the walls of a cottage, say of 500 cubic feet, will be reduced from gallons of water.

“ Any gentleman who has a tile-machine and a kiln may with it use almost any description of clay, and more conveniently apply it to the manufacture of hollow than common bricks for the construction of dwellings for his labourers, which dwellings will be drier and warmer, and he may afford to let them at a lower rent than the common cottages.

“ For farm-steadings also, and for garden walls, the less absorbent and drier walls, constructed with the harder burnt and less porous hollow bricks, will be found of great advantage.

“ But the remaining absorbent power of the hollow bricks, it may be submitted, is an ill quality, for the removal of which it is worth while to make exertions. To this end I have requested a trial to be made of a machine, for giving additional density by additional pressure to the bricks made by the machine. The trials are very satisfactory, and the work is promised to be done at a very cheap rate.

“ I propose to have the bricks glazed, to save whitewashing and paint inside the house, and to give a cheerful appearance on the outside, and to repel the weather. The process, judging by that for pottery, need not be an expensive one. It would, moreover, be worth the while to increase the density of the clay, by a careful preparation of it in the mode of potter's clays.

“ By the additional pressure greater exactitude to form will be given, and larger bricks made, fit for a construction of the nature of ashlar or stone construction.

“ To keep, however, to the construction of walls, there appears to be no reason for supposing that a 5 or 6-inch wall may not be made by means of hollow bricks sufficiently dry and warm to render any further increase of thickness of little moment compared with the expense.

“ In towns space in houses is of the greatest consequence. There the space for the houses of the poorer classes may be taken as small and fixed, and this being so, all that can be gained from the thickness of walls, within that fixed area, is gained as breathing-space.

“ Thus the difference between a 9-inch and 5-inch wall, in a fourth class two-story house, is about 500 cubic feet, equal to the space for two bed recesses, or one small sleeping-room.

“The improvement in the manufacture of bricks, so as to ensure to a thick wall greater dryness and warmth than to a practically thick wall, is a highly important object.

“Hollow bricks, it may be stated, from the experience of hollow walls, will transmit far less sound than solid walls. Partitions may be made of 3-inch hollow brick, which will not only attain this end excellently well, but another—that of superseding the hollow wooden partitions, which gave dreadful facilities for the spread of fires.

“In confined space and crowded apartments the noise and disturbances from the tread of adults, not to speak of children or their noises, is the occasion of much irritation, and in the cases of sickness of pain and injury.

“To prevent this, and to isolate as far as possible one family from another, and the living-rooms from the sleeping-rooms, the floors of some of the improved dwellings for the labouring classes at Birkenhead were constructed of brick in flat arches of about 6 feet span. The arches were tied together by iron ties, and abutted in the centre on an iron beam. The spaces between the upper surface of the arches and the spandrels were filled in by mortar, on which flat tiles were imbedded. They answered the purpose perfectly; but the weight of a floor of such a construction must be very great. Observing this construction, and, generally, the economy of constructions of groined arches in brick, where the same centring was used successively for many arches, it occurred to me to propose the construction of such floors of hollow brick, moulded in form for the purpose. The precise thickness, and the best forms of bricks for the purpose may not be readily determined. The expense of an ordinary wooden floor, of 12 feet square, would be about, I am informed, 7*l.*; the expense of an arched floor of the hollow brick construction, tied together with iron ties, taking the hollow brick at one-third less price than the solid bricks, is estimated at 4*l.*

“With constructions of these hollow bricks experiments were made—

“1st. For a series of arches of small curvatures without iron ties.

“2nd. For circular arches without iron ties.

“3rd. Elliptical arches with iron ties. The experimental arches were 2 metres, or 6 feet 6 inches wide, or 43 square feet, being a portion of a surface of 690 feet.

“The ordinary weight of a common wooden floor of that extent, as constructed in England, would be about 700 lbs., and it would be expected to bear, say 2 tons. Each ton would be equivalent to the average weight of say 15 adult persons, at least, in England. The results were—that the elliptical arch made of earthenware pots or hollow bricks, 6½ inches high and 3¼ inches in diameter, without iron ties, supported, besides its own weight, a load of about 2 tons 10 cwt. on each 10 superficial feet.

“That an arch of small curvature, made of hollow bricks 9¾ inches high and 5½ inches diameter, supported, besides its own weight, a load of 3 tons 18 cwt. on each 10¾ superficial feet.

“That a portion of a circular arch, constructed with earthenware pots 12½ inches deep and 5½ inches in diameter, supported, besides its own weight, a load of upwards of 5 tons, or the weight of more than 67 adult persons of 165 lbs. each; that a floor of earthen pots, 4 inches high and 3½ inches in diameter, tied with iron ties, supported, besides its own

weight, a load of 2 tons per square foot; that a floor, formed with earthen pots $7\frac{1}{2}$ inches high and $4\frac{1}{2}$ inches in diameter, and tied with iron ties, supported more than 3,994 lbs., or the weight of 24 adult persons, besides its own weight.

“The experiments and practical experience in private and public buildings of the Parisian architect corroborate the general conclusions which are submitted as established in relation to the hollow brick construction, as being superior to the common stone and brick construction:—

“In preventing the passage of humidity and being drier.

“In preventing the passage of heat, and being warmer in winter and cooler in summer.

“In being a security against fire.

“In preventing the passage of sound.

“In having less unnecessary material, and being lighter.

“In being better dried, and burnt harder and stronger.

“In being more cleanly.

“In being cheaper.

“The extent to which these qualities are attainable must depend upon the extent of demand for them, upon further attention and experience being brought to bear upon them, and on the approved application of machinery to the construction of the various eligible forms of hollow bricks.”

The use of bricks and tiles, solid and hollow, appears to be as old as the records of history. They are dug from the buried ruins of a forgotten civilization in Asia; the Egyptians converted their manufacture into an intolerable burden to the enslaved Jews; the Etruscans and Greeks were skilled in the art of working clay, to an extent even now considered almost perfect; the Romans constructed vast works with bricks and tiles, moulded into forms of use and beauty, unknown even in this age of invention; and the Italian architects have used bricks and tiles in their buildings, following the examples set them by their Roman predecessors.

All that is required now is fully to direct attention to the subject, and that general intelligence which has made Birmingham the metropolis of manufactures, and perfected the steam-engine, will also put this material to its most beneficial use. There is, as previously stated, in the neighbourhood of Birmingham, clay in abundance, fuel cheap, tile and brick-making machines to economize labour, &c. There has hitherto been one great drawback to improvement in brick and tile construction,—the excise duty. This in a great measure has arisen from an idea that the law dictated the form and size, namely, 10 inches by 5 inches by 3 inches, or 150 cube inches. The 150 cube inches the law does dictate as the largest size for single duty; but any form may be given to that cubic capacity; and, if the brick does not displace, in water, more than this number of inches, it will be allowed at the single duty. Double duty

only is charged for all forms and dimensions above the standard capacity.

Hollow tiles 9 inches square and 2 feet in length have been made, and I was informed that they might be produced in quantity at from 5*l.* to 10*l.* the 1,000; 1,000 of such tiles would do the work of 15,000 bricks. The cost of each would be as under:—

Comparative Cost of Hollow Tile and Solid Bricks.

	£.	s.	d.	=	£.	s.	d.
15,000 common bricks, at per 1,000	1	4	0	=	18	0	0
1,000 hollow tiles, 9 inches square and 10 feet long, say	7	10	0	=	7	10	0
					<hr/>		
In favour of tile					10	10	0

Used with iron, wrought and cast, hollow bricks may be combined for purposes where, at present, wood alone is introduced. In hospitals, gaols, workhouses, and asylums, they will give ready means for a general diffusion of warmth and ventilation; barracks in tropical climates, so constructed, with hollow walls, would resist the intense action of the sun, and the solid material of the tile the attacks of insects, and, what is almost of as much consequence, their carriage would be about one-third that of solid bricks. Factories and warehouses would be made fire-proof at the least cost, as much weight in the floors would be avoided. The dwelling-houses of the wealthy may have, in every room, a completeness of ventilation at present unattainable with solid bricks. The humblest cottage may have walls, stairs, floors, and roof of the same hollow material; they may be made dry, warm, and fire-proof; ventilation may be simple and effective, and fuel may be economized to an extent not at present practised, by expending much of the heat of the fire in the hollow walls and floors. With these advantages, Mr. Chadwick proposes to combine extreme solidity of substance and colour: solidity and finish he will obtain by mechanical pressure; colour by thin layers of tinted clay pressed on the surface, or by washing the semi-dried brick or tile in a mineral solution. The tile-making machines will press out any form of section, plain or moulded; and any raised form, not undercut, may be obtained by pressure, as practised in terra-cotta. Hollow bricks can be made subservient to improved construction; they may be worked and combined with stone, solid brick, iron, and timber; they may be made to serve in numerous instances all the purposes of solid material, with advantages peculiarly their own.

The modern French architects use a kind of pottery vase in construction for partition walls, floors, stairs, and ceilings; but they depend more upon the lightness of the material and the strength of their mortar and cement, for the stability of their

works, than upon skill in constructive adaptation of their hollow pots. In fact, the stability of their work depends upon the strength of the mortar or cement (gypsum), and iron bond, altogether.

Ventilation is of as much importance to health as warmth, but the means of securing it are not attended to. It is a fact that cannot be too widely known, that a modern house, built in what is termed "the best manner," is about as injurious a place of residence as any man could devise. All the walls are solid; the specification described that they should be "well flushed, jointed, and perfectly grouted up;" the floors are formed with "narrow stone-dried boards, close jointed, and laid in the best manner;" the doors and windows are the perfection of workmanship, as, when closed, they will scarcely admit a breath of air; the "skirtings are of cement," the slates are close pointed," the chimney openings are upon "the most recently improved principle," low; and the whole structure approaches as nearly as human ingenuity and "good workmanship" can make it, to the condition of an hermetically sealed bottle; and in these rooms wealthy human beings live and breathe; head-aches, it is true, are common, but they proceed from the "weather," or some cause beyond the reach of medicine. I have been in one of these "well-finished rooms," when the door has vibrated with the in-draft, like an eolian harp; perhaps one of the greatest blessings which can befall a family is to get into what is termed "a slight and ill-built home," in which it is impossible to block constant ventilation. But it will be far better to build from the commencement with this means in view. Dr. Arnott's apparatus is a simple and beneficial contrivance, but it does not effect fully all that is required, as the ventilation is confined to one small opening; the means of admission for fresh air should be general and diffuse, the means for abstracting vitiated air are the same; as the more diffuse the opening, the less perceptible will the draft be. An opening 12 inches square is not too much for an ordinary dining-room, but if it is made at one point, the draft would be excessive, and if two such are made, for ingress and egress, there would be a direct current from one to the other, leaving the air on each side comparatively undisturbed, as may be seen in many lakes where a river holds its course in a direct line across. In place of making one or two square openings, the sectional area should be lengthened out, for instance, an opening 96 feet in length, and one-eighth of an inch wide, would be equal to one of 12 inches square, and such a slit-like opening may be made all round the skirting, and at the junction of the ceiling and the wall. Hollow bricks will readily and cheaply place the means of effecting this under control, we could then have our rooms in a healthy condition at all times and seasons.

REMEDIAL MEASURES PROPOSED.

PROPOSED WATER SUPPLY.—A full supply of water to a town so important as Birmingham ought not to be under eight millions of gallons each day. It should be upon the high-pressure principle, and the supply must be constant. The assessment of the borough is about 600,000*l.* per annum, and consequently a water-rate of 6*d.* in the pound would produce an income of 15,000*l.* a-year, and at 5 per cent. this would represent a capital of 300,000*l.* in gross. A supply of eight millions of gallons of water per day would be equal to an annual supply of 2,920 millions of gallons annually, and would cost at the above rate 1½*d.* each thousand gallons. The present Company can very materially extend their works if a rate is made general, the great drawback has been want of customers. The engineer to the works stated, that he had no doubt but that if required they could increase their supply to 10 millions of gallons a-day.

I have not had time or opportunity fully to examine the surrounding district, but Mr. Pigott Smith states that an abundant supply may be brought from the Lickey Hills in Worcestershire, where there is a district of about 30 square miles, or 19,200 acres, which may be made available as a gathering ground. There are no manufactures to pollute the water, and only eight small mills. This water may be brought nearly the whole distance in an open conduit, and can be so delivered in the town at an elevation of 180 feet above the present summit reservoir of the water-works.

It is of the utmost importance to the future welfare of Birmingham that a large and comprehensive scheme of water supply should be at once devised both as regards utility and true economy.

ANALYSIS OF WATER FROM LICKEY HILLS.—Degrees of hardness 2½°.—*Dr. Lyon Playfair.*

SEWERS AND DRAINS.—A system of perfect sewage and drainage has been laid down with the valuable assistance of Mr. Pigott Smith, and an accurate estimate made out, in which it is found that 37,652*l.* 15*s.* will be required to complete the mains, and 64,566*l.* 4*s.* 6*d.* for the secondary branches and street drains; or, in the whole, 102,218*l.* 19*s.* 6*d.*, the annual interest, at 7½ per cent. upon this sum will be about 7,500*l.*, or it would require an annual rate of 3*d.* in the pound; this will pay the interest of the capital borrowed, and provide a sinking fund to liquidate the debt in 30 years; an additional rate of ½*d.* in the pound will pay for superintendence and annual repairs.

The cost of private and house drains will be about 135,000*l.*, which must be levied as a private improvement rate, and would be about 6*d.* in the pound on the whole rateable property. But the owner of a 10*l.* house could either pay down at once the first cost for private drains, which will not exceed 3*l.* for a cottage, or he may pay a rate or rent-charge of 4*s.* a-year, or less than 1*d.* a-week.

The whole amount of rates for the improvements proposed will then be as under :—

	<i>d.</i>	
Public mains, sewers, and drains . . .	3	in the pound.
Superintendence	0½	, ,
Sweeping and watering roads and streets	0½	, ,
Scavenging and cleansing all yards and courts	0½	, ,
	—	
Or for these purposes a rate of . . .	4½	, ,
	—	

MANAGEMENT OF WORKS.—To insure unity of action and economy, the whole of the sanitary works must be under one management, so that one set of offices and officers will perform the entire work. The servants of one establishment will serve for all purposes connected with the local management of the works during their progress, and the maintenance afterwards.

The principal portion of Birmingham may be drained with earthenware tile drains, and these may be most advantageously made in the district, as clay is abundant, and coals cheap. But in order to insure the utmost efficiency and economy in the works, and to afford every facility and guarantee for its execution, steps should be taken to provide the best means for the manufacture of the materials, and to organize a body of men to construct the work; and this will be best attained by contracts, which shall embrace the maintenance of the works in perfect repair after their execution.

HOUSE-DRAINS AND WATER-CLOSETS.—As in a complete system of water supply every house must have a water-tap provided, so must each house and yard have a drain to take off the refuse; there will be a branch to the sink provided, with a bent syphon or water-trap; into this branch, in many instances, the water from the roof will pass direct, and there will be a separate branch for the surface drainage and water-closet. Detailed estimates have been made out for such apparatus in other places, and the works executed for a cost of 2*l.* 10*s.* to each house, or 7 per cent.; an annual charge of 3*s.* 9*d.*, or less than 1*d.* a-week.

THE APPLICATION OF TOWN REFUSE IN THE FORM OF LIQUID MANURE.—This matter has long engaged the attention of the most eminent chemists, such as Leibig, and practical agriculturists, such as Mr. Smith of Deanston, and many others, all of whom speak with the utmost confidence as to its great fertilizing utility. The theory of the chemist is fully verified by the successful operations of the practical farmer.

In all ages, and in all countries, irrigation has ever been regarded as the best means of producing fertility. The Egyptian bowed down in religious reverence to the awful mud-laden waters of the rising Nile. The Hindoo built vast tanks in which to store the excess of rain for after use, or trenched in contours the hill-side and valley to lead the precious fluid over his paddy-grounds. The Mexican and Peruvian cut surface aqueducts 300 miles in length for irrigation. The vast ruins of a past civilization on the old continents and in the new attest to the extreme value placed upon this means of securing fertility, and modern practice has more than realized even the fabled wonders of antiquity. The Chinese store every portion of refuse for agricultural use; they do not commit the extreme folly of sending ships 5,000 miles for the inferior produce of a distant land, and blindly pour their own more valuable manure into the nearest stream, or allow it to stagnate on surface-gutters, in cesspools, dumb wells, and imperfect sewers, there to generate filth, disease, and death. They *have made* "that which is the bane of our towns" the "boon of their country," and to this must our civilization rapidly lead. If the drainage of Birmingham is made to realize its full value, according to the calculations chemists have made, it would reach in gross 100,000*l.* a year; but one-tenth of this would much more than pay all the improvement rates required at present, and for years to come.

Mr. Smith of Deanston, says,—

"The practicability of the application of the sewage-water for agricultural purposes is now placed beyond the category of project, for its merits have not only been fully investigated and approved by scientific inquiry, but all the points of usefulness have been fully established by practice."

There are few towns so favourably situated as Birmingham to enable full effect to be given to the application of its sewage refuse; standing near the centre of England, at an elevation of 400 feet above the sea, with a fall northward and eastward, and a river outlet in that direction, flanked by some of the richest meadow land in the kingdom, which is situated on the banks of the Tame, and the Trent, down to the Humber. The whole sewage of the town may be passed, self-gravitating, in earthenware pipes, down such portions of the valley as it is desired shall be brought under its influence, realizing an income to the town, and offering an immense benefit to the landowner and agriculturist. That which the Egyptians, the Hindoos, and the

Mexicans did with their mud-laden waters (or clear water alone) from their rivers, we may do with tenfold advantage with the diluted sewer refuse from a well-drained town. It is said, that which has been done may be imitated, where the circumstances are similar. The following has been done at Edinburgh.

Irrigation at Edinburgh, &c.—Of the efficacy of sewage-water applied by irrigation we have many practical proofs of long standing. The grass meadows near Edinburgh, upon some of which the sewage-water has been used for upwards of 100 years, and more extensively during the last 40 years, afford indisputable proofs of its value, as the land which had let formerly at from 5*l.* to 8*l.* per acre, is now let annually by public auction for rents varying from 15*l.* to 40*l.* per acre. On one portion, which 30 years ago was a sandy rabbit warren on the sea-shore, growing nothing but coarse grasses, and gorse or whins, the sewage-water was applied, having previously irrigated a succession of meadows, and this land was thereby raised from an annual value of 2*s.* 6*d.* per acre, to that of from 15*l.* to 20*l.* an acre.

Experiments have been made in other places, and results equally satisfactory have been obtained, as at Glasgow, Stirling, Bury in Lancashire, and near Manchester, under the superintendence of Philip Holland, Esq., on the Duke of Portland's estates at Clipston, and at other places, by other persons.

The liquid is applied to the land in all its agricultural conditions. It is applied to grass for hay, for grass to be cut and used green, and to pasture, to stubble land before being ploughed, to ploughed land preparing for green crops, and it has been successfully applied to promote the advance of turnip crops during their growth. The crops of all kinds have been uniformly superior to those raised with solid farm manure, under similar conditions. The straw of the crops from the liquid manure has been more firm, and the grain heavier in quality.

Manure in the liquid form is in much more minute division; it admits of the most equal distribution, it is instantly absorbed diffusively into the body of the soil near the surface, and in that diffused condition it is ready to be taken up by the roots of the plants in every portion of the soil; the consequence is, that the growth of the plant is always vigorous.

Sewage has been applied also on the meadows below Salisbury, and on a greater or less scale near many towns in England and Scotland; where the natural conditions for application are obvious, similar results may be found. We have, through Mr. Chadwick's valuable publications, notices of the successful application of sewage water by irrigation at Milan, and elsewhere on the continent of Europe.

The application of this refuse will be a benefit to all parties

independently of any mere money profit, and that of preserving the rivers and streams comparatively pure will not be one of the least of all the numerous advantages.

BOUNDARIES FOR THE PURPOSES OF THE ACT.—I would beg respectfully to recommend that the borough boundary, including the hamlets of Duddeston and Nechells, Deritend and Bordesley, and the parish of Edgbaston, shall be the boundary for the purposes of the Public Health Act.

CONSTITUTION OF LOCAL BOARD.—The town of Birmingham being a corporate borough the local Board will be formed as the Act directs.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.—Having fully examined the town and suburbs of Birmingham, I beg respectfully to recommend that the Public Health Act be put in force; that the local power so necessary to cheap and efficient government may be consolidated, and that the whole sanitary work of the borough may be placed under one establishment.

I beg respectfully to lay the following summary before the General Board of Health for their consideration:

1. That the borough of Birmingham is not so healthy as it may be, on account of unpaved streets, confined courts, open middens and cesspools, and stagnant ditches.

2. That excess of disease may be distinctly traced to crowded lodging-houses and want of ventilation in confined courts, and to the want of drains generally.

3. That the present church and chapel yards within the town which are used as burial-grounds should be closed.

4. That a better supply of water should be provided, and that a perfect system of sewers and drains should be laid down.

5. That public parks and pleasure-grounds would be very beneficial to the working classes and their families.

6. That a consolidation of the conflicting power exercised within the borough would produce great economy.

7. That the health of the inhabitants would be improved, their comforts increased, and their moral condition raised:—

1. By a perfect system of street, court, yard, and house-drainage.

2. By a constant and cheap supply of pure water under pressure, laid on to every house and yard, to the entire superseding of all local wells and pumps, the water of which is impure.

3. By the substitution of water-closets or soil-pan apparatus (for the more expensive existing privies and cesspools), with proper drains to carry away all surface-water and refuse from the roofs, streets, yards, and water-closets.

4. By properly paved courts and passages, and by a regular system of washing and cleansing all courts, passages, footpaths, and surface-channels.

8. That these improvements may be realized, independently of any advantage to be derived from the application of town refuse to agricultural purposes, at the rates per week for each house and labourer's cottage here stated:—

1. A full and complete system of house and yard-drains, with a water-closet and soil-pan, and yard-drain to each house, three halfpence per week.

2. A constant high pressure supply of pure water laid on in each house, with a water-tap and waste-water sink to each house complete, for three halfpence a-week.

3. Complete and perfect pavement to all yards and courts, with proper surface-channels and grates, at one farthing a-week each house.

4. Washing, cleansing, and watering streets, courts, foot-walks, and surface channels, at one farthing a-week each house.

9. That from the character of the soil in the neighbourhood of the town, sewage manure may be applied to the agricultural land by irrigation, with singular advantage, so as to increase its value to the farmer, and yield an income for the benefit and improvement of the town.

10. That these improvements will increase the health and comfort of all classes, and reduce the amount of poor's-rates.

11. That the direct charges stated will be the means of a direct and indirect saving to the inhabitants generally, but to the labouring man especially, of many times the amount to be paid.

12. That the outlay will not be burthensome or oppressive to any class of the community, as the capital required may be raised by loan, and the interest upon it reduced to an annual or weekly rent-charge.

CONCLUDING PARAGRAPH.—That the Public Health Act is not only necessary, but will be of the greatest advantage to the rate-payers generally, as it will render their public officers responsible, and make an annual published account imperative,

I have, &c.,

ROBERT RAWLINSON.

APPENDIX A.

REMARKS and SUGGESTIONS by JOSEPH HODGSON, Esq.,
Surgeon, F.R.S., Medical Sanitary Inspector for the Corporation of Birmingham; giving in evidence at the Inquiry.

I have resided and been in the practice of my profession, in the town of Birmingham, for more than 30 years, and have been Sanitary Inspector to the Corporation for the last two years or more.

I think that the health, comfort, and moral condition of the people would be very much improved by an improved state of the drainage of the town. Many of the courts are not only undrained but have no proper privy accommodation, the cesspools and the middens are in contact with the houses, and the material percolates through the houses, and creates bad smells in the adjoining premises, which is a great and constant nuisance to the people. In the course of my visits as Sanitary Inspector I have very frequently found courts in which the pumps were so situated, that the water was rendered impure by the percolation from the privies, and from other impurities going into them. I think one of the greatest evils among the lower classes in this town is the condition of the privies, the mixens, and the surface of the courts. The common practice in this town is, that the manure should mix up with the ashes and rubbish of the mixen, and there it lies till the place is full. There is very frequently a dispute as to who is to remove it, and at whose cost it is to be done, till it overruns the seats, runs into the court, and gives rise to noxious exhalations, which, in my opinion, are injurious to health, as well as to decency, to say nothing of the injurious results which often arise from the percolation of the more fluid parts of the contents of the privies into the neighbouring buildings. During the time that I have been Inspector upwards of 400 nuisances have been removed, and the consequence has been, that an improvement has been observable in the state of the privies. When I say upwards of 400, I do not want to be very accurate, because 400 is near enough for two years. In particular situations, where nuisances have been removed, the comfort and health of the inhabitants has no doubt improved. This is not the only way in which privies are injurious to health, as in many cases they are totally unusable, in consequence of which people don't go to them, they neglect the state of their bowels, and they get many of those disorders which arise from the derangement of the digestive organs which is thereby produced. I wish also to observe, that though I have inspected, I think I may say, many hundreds of the privies in the town, I do not think that in more than three or four instances I have found any accommodation for the children, I mean small low seats; the consequence is, that these poor children are absolutely destitute of such accommodation as this. The manner in which this evil is in some degree abated is this, they make use of pots in the house, and there the stuff lies in the house till it is convenient for the mother to throw it away. In other cases they go and discharge the

contents of their bowels anywhere about in the neighbourhood of the
lixens; and I have scores of times gone to see places where Bliss has
aid, "Mind where you tread, Sir, for the children have been here." I
am positive that a great share of the disease in this town, particularly
of fever and contagious disease, together with the bad health of the
people, is the consequence of the imperfect state of the privies. I may
perhaps leave also to remark, that the generality of the privies in this town
are in a very conspicuous part of the premises, and it rarely happens
that there is any door; there may have been one originally, but you
very seldom see a door, and it frequently happens that as persons go to
these privies they are obliged to pass their neighbours' houses, and be
subjected, more particularly the women, to the annoyance of laughing
and derision from the men; and some of the women have told me, that
in consequence, they have made use of the chamber-pot in their own
houses and at night they have emptied it, consequently you may
imagine how often that is done. In other cases the door is open and it
is thrown out without the least reference to the spot where it falls, or
anything else. You will see that, Sir, in the Inkleys, in Slaney-street,
and all those parts of the town where the Irish more particularly reside;
that there is a great deal more to be said about the privies. Not only
is the condition of the privies very bad among the lower classes, but
so among the better classes they are extremely bad, and the public
latrines or ditches of the town, in many situations, are made to answer
the purposes of cesspools. I would particularly mention as one place,
the Hagley-road, where this has happened, the water-closets of some
of the houses absolutely discharge themselves into the road. We have
removed them up from time to time for the nuisance, and they scrape and
rape and throw down ashes, and do all they can to cover it. I believe
now that if you were curious enough to go, you would find pieces of
paper, and all the rest of it, that had been used to-day. It is not only
here but in the Bristol-road the same thing takes place. There is also
another evil in relation to the privies which I beg to mention. The
drainage of these in all parts of the town runs into gutters, brooks, or
ditches. That is brooks (call them rivulets, if you please) running
to the river. These in time become sewers. Now it frequently
happens that privies are built and the contents are discharged into a dry
brook, where they accumulate, and means have not been taken in this
town (saving the presence of these Commissioners, be it said) to cover
over all these places; we (the Medical Inspectors) have been the means
of covering over some of them.

In Digbeth there is a most horrible place which we have had covered
over; but if you wish to see a terrible specimen of a place like this, I
should advise you to call at a butcher's shop near Dretend, and when
you are sitting in the butcher's parlour it might happen to you as it
did to me, that some one used a water-closet of a neighbouring house,
and the water and everything else was discharged, so to speak, smack
in our faces. Again, in the neighbourhood of Chapel-street there is
a similar nuisance, which has been represented several times, but the
removal of which has not yet been effected. There is one abomi-
nable ditch running parallel with the east side of Cheapside. You
must go up the courts to find it. Then again there is a very bad
one in or near Barford-street, that is where we have worked at them so

much. There is one of those uninclosed rivulets which has been a receptacle for filth for many years. The year before last the typhus fever prevailed in the houses there, and in my opinion the horrible condition of that ditch increased, if it did not cause it; and I would mention that it has been scraped, until the bottom has become so much lowered that it never discharges itself, but it is an everlasting cesspool. Then there is another at the back of Lombard-street, this was originally a natural water-course. That is the way in which the sewerage of a town naturally accumulates, and this to which I have alluded is not the only nuisance to be found, but such exists also about Hockley Brook, where within the last 20 years a large population has become fixed, and where the brooks are getting very narrow in the way I have already described. The condition of the privies, the condition of the brooks, and the condition of the river, are, in my opinion, the three greatest evils, in a sanitary point of view, in the condition of this town.

With regard to the condition of the river, I would observe, that it is certainly a very great nuisance to this town through its whole extent; the sewage for the most part is discharged into the river towards the west end of the town. The river running west to east, the consequence is that the water of the river is rendered very impure by it; and it continues in its course receiving tributary streams of filth discharging in the summer the most noxious exhalations, which are to be experienced as you pass over Deritend Bridge on a hot summer day. I would further observe, that towards the Railway Station there are some most offensive accumulations by the sides of the river and the stream is in the most polluted state. I have seen it within the last summer, when it has been as black as a pretty strong solution of Indian ink; and it is to be found in that state, flowing as darkly as I tell you, till it arrives at Duddeston Mills, so that the froth of it instead of being white, is brown. I wish also to observe (if I understand it rightly) that some years ago, when the Warwick and Birmingham Canal was formed, the natural course of the river was diverted for some purpose connected with the canal; the consequence was that the natural loop of the river was cut off. They made a sort of loop for some purpose, I believe to avoid going over the work twice, and doing so they made the course of the river a little straighter, as I understand they would have had to make two embankments; however that may be, the consequence is that there remains a sort of lake, in an inner place, or morass of filth, into which a part of the Deritend sewage is discharged.

The sewage is discharged into this dead sea, and it has no mode of getting out again; so there it lies to evaporate. That part is much built upon at present, but as the land becomes more valuable and it is already valuable, houses will be built on this morass of filth. This has frequently been represented to the authorities of the town. These are some of the evils of the condition of the town, but there are some others with regard to the drainage. I would observe, that there are two valleys, or, if I may so call them, ravines, on the side of which this town is principally built. These valleys are—the Valley of the Rea; the other has no name, but, if you please, we will call it the Valley of Lady Wood Brook and Hockley Brook, which originate at that part. These are the two natural drainages of the sewers. N

The Hockley Brook is not much covered in, and that near Lady Wood brook is altogether uncovered; there is a great piece by the hospital which is not covered in, and I do not know whether it is all covered in a Cleveland-street. I refer to that portion of the meadows called Aston Brook, in order to direct your attention principally in reference to what is going on at Birmingham Heath. At Birmingham Heath three very large buildings are in the course of erection (or, rather, I should say two, for the workhouse is not yet begun); I refer to the workhouse, the gaol, and the lunatic asylum, which three buildings when complete, I believe I am under the mark when I say they will contain 1,500 persons. That drainage it is intended to carry in two directions to Hockley Brook; the workhouse drainage is to be carried by one sewer, to be made from the workhouse along the Dudley-road under the canals, but how it is to be got there I do not know: it will be a long drain which will take it down from there to Spring Hill into Hockley Pool; and by some means or other it will get along and empty itself in the brook. Then the drainage of the gaol is to go on the other side. The sewage of 1,500 persons would be very considerable, of course; and these brooks will, at no great distance of time, be just in the condition in which the river Rea is now; they will be just as bad, and from that being the lowest elevation of the town I consider that there is great danger that the health of the inhabitants will suffer from the kind of drainage which it is there contemplated to carry into effect. I do think it is much to be regretted that some system of drainage into tanks for these three large buildings could not be adopted, and that they have not tried in so favourable a situation the system of tanking, and employing the produce for agricultural purposes, instead of allowing it to flow down into the brooks to the injury of the health of the town. It was the nicest opportunity possible for trying the experiment; but the plans are adopted, and if carried out the brooks will eventually become extended cesspools; and I think it is much to be regretted that the sewage of these three large buildings should open into the brooks, and have to run along for miles. There are also nuisances belonging to the public authorities themselves, viz., those depôts of manure by the sides of the canal. There is one in Fazeley-street, one at Walmer-lane Bridge, and three opposite the hospital in Bath-street. I went to look at one the other day, and seeing a man, I said to him, "There is nothing but sweepings here." He gave me a look, and taking me, I suppose, for a farmer, he said, "Oh, yes, Sir, there have been several loads of capital privy muck put into it within the last few days." I must say, that large depôts of manure in every part of the town are insalubrious; and as a proof I would mention that I had a patient, a lady, who lived in the neighbourhood of the one at Walmer-lane, who was always ill. I sent her out of the town, and she recovered; but when she came back she invariably became ill again. At length, at my suggestion, she went to reside at the Lozells, and she has been very well ever since. In the summer time swarms of flies, millions upon millions of flies, infest the houses situated in this neighbourhood; these flies go and feed upon the manure in the depôts; they carry it away on their legs and wings, and whatever evil arises from the evaporation of this fœtid matter is brought into actual contact with human beings. These things are more important than many persons think.

I do not mean to say that it was wrong to place them there; but, in my opinion, they are injurious to health. I would also mention, that a great many of the drains are discharged into the canals. I resided some time back in the Crescent, and our water-closet was discharged into the Birmingham Canal. This is a great nuisance, because it renders the water of the canal more impure than it is now; and we all know that the neighbourhood of Cumberland-street and Oozells-street are in this state. This is an evil which ought to be abated. Whether the canal people have a right to stop any of it or not I do not know, but in many instances they have no right, because the owners of the property have a prescriptive right to let it go in. It has run in so long that they have no right to stop it; and I remember that Crowley's people complained of the water-closets emptying themselves into the canal under the very noses of the men as they were at work; but the owners have said, "We have had it so long that we cannot alter it."

Further, a very large portion of this town is totally without drainage; as an illustration, I would instance the Workhouse Field, a large portion of the neighbourhood of St. George's Church, and particularly the suburban parts. Nearly a year ago I asked my friend Mr. Pigott Smith, for my own information, what was the length of the street or carriage-roads in the town of Birmingham, and of the suburban roads; and he had the kindness to send me this paper, which, with his permission, I beg to hand in to you. That, Sir, I considered a very important document; and you will observe that out of 124 miles at that time existing, only $43\frac{1}{2}$ miles had sewage. It does not include the courts and yards. In many parts of the town the old drainage is not of sufficient depth to drain the cellars, and it is further of very imperfect construction, in many places, I believe, having a flat bottom. The new sewage is most beautifully executed; it is impossible to conceive finer specimens of masonry than they exhibit; the flushing apparatus in them appears to be most perfect. I am sorry to say, however, that the inhabitants do not make much use of them for house-drainage, and that on account of the expense attending it; for they will not do it until some compulsory powers are given to the authorities to cause them to do so. The establishment of public conveniences, especially for the use of the poor, would be a great benefit.

These conveniences being constructed according to the most improved modern principle on which water-closets are made, having a communication with the public drains; and I do not think that any great amendment can be made in the condition of the privies in the poorer parts of this town till they are placed under the superintendence and management of the local authorities: so long as they are left in the hands of landlords and tenants, they never will be efficiently looked after and cleansed. I would also wish to make some remarks with regard to the supply of water in the courts; until that is under the control of the authorities, neither landlords nor tenants will take care that the inhabitants are properly supplied, and the inhabitants will not obtain a proper supply. One great difficulty in the drainage of this town is the want of water in the higher levels; for, inasmuch as drainage consists in the admitting, and then the washing away of filth, unless you have an abundant supply of water, you cannot obtain a sufficient

state of fluidity to enable it to run through drains of this construction: the question therefore is, how can the higher levels of this town, such as Edgbaston, Camphill, and the neighbourhood of St. George's Church, be properly supplied with water so as to wash it away. The greater part of the town is supplied with water by means of pumps. This water, though hard, is pretty good, and there is no great fault to be found with it generally. The supply by the water-works is on the intermittent system. I cannot say that it is of the very best quality. I had occasion the other day to require some for drinking purposes in the neighbourhood of the New Church, yet although drawn from the cistern, and though the cistern was pretty clean, the water was by no means so clear and good as you see it in many places. It is on the intermittent system, and in the higher levels the pipes are not always full. In my own neighbourhood in the Hagley-road, some years ago there was a fire, and it was some minutes before the water was in those pipes; indeed, the men were obliged to go to the turncock at or near to the reservoir to let it on, before the water could be procured.

The condition of the slaughter-houses in this town is an evil; they are distributed over various parts of the town, and some of them are not of that kind that they should be. I would also observe, that there are some knackers' yards in the town which ought to be looked to. There is one in the neighbourhood of Cheapside which is very offensive in the summer time. There is also one in New Canal-street, which they keep as clean as they can, but which is an evil in the midst of a large population; I once saw 20 dead horses there at one time. In order to get rid of the refuse that arises in such a business, I observed that they had a great hole made into a very large sewer which runs into the yard, and there they pour in the blood and refuse and all the horrible compound that the place can furnish. Near the mouth of the Fazeley-street sewer, where it opens into the river, there lives a dust-washer, and I understand that the stream from this sewer has been diverted through his yard, that he may employ the water thereof with Mr. Turvey's additions in washing dust. I do not say that it is injurious to health, but at all events it is not the right way for the waters of the sewers to be employed. There are in this town no rules or powers for preventing persons building houses without a previously arranged plan of drainage; and the consequence is, that houses are frequently built, and the sewage is discharged into the gutter or pools in the neighbourhood, and there it becomes a great nuisance, and injurious to the health of the locality. I think that before any building is erected (if the Health of Towns' Bill be brought into this town) there ought to be an accredited system of sewage adopted.

There are also some businesses carried on in this town which should be removed from the immediate neighbourhood of the town. Besides the businesses of the character which I have just mentioned, the most important of these is that of bone-boiling; it is exceedingly offensive, and complaints have been made to us by the inhabitants resident in the neighbourhood of such places that their health has suffered from it. Now I consider, that a noxious business of that description should not exist in the immediate vicinity of, or in the midst of a dense population. The principal burial-places, until the cemeteries were established, are situated close to one another. The majority of the funerals take place in a circle the diameter of which is not more than a mile.

Some of the churchyards are very much thronged. In the lower parts of the town, particularly Edgbaston-street, the Inkley's, Digbeth, and also Lichfield-street, Slaney-street, Thomas-street, and in London Prentice-street. Many of the courts and cottage-buildings are in a very dilapidated condition; and the surface of the courts is so uneven, that the rain-water and other fluids on them is not properly discharged; and I consider that a very great benefit will be derived from the proper levelling of the surface of these courts. The condition of the lodging-houses for poor persons in these parts of the town is, in my opinion, highly prejudicial to the health of the inmates. They are often extremely filthy and over-crowded, and I know of nothing which will be more likely to conduce to the health and comfort of the lowest orders of the inhabitants, than the establishment of proper lodging-houses for them; and some attention to this point appears to be more necessary at present, inasmuch as a great number of these dwellings have been destroyed by the railroads being carried through the town; and this has led to those which remain having been much more crowded than they were before. Formerly low fever was occasionally prevalent in Birmingham; but of late years I have reason to believe that it has very much increased, in consequence of the places in which the working-classes reside becoming overcrowded, and partly perhaps in consequence of an influx of Irish, who have brought the disease with them. I believe that the establishment of model or suitable lodging-houses and of baths and wash-houses would contribute very essentially to the physical as well as the moral improvement of the working-classes in this town.

APPENDIX B.

REMARKS AND SUGGESTIONS by JAMES RUSSELL, Esq., Surgeon, Medical Sanitary Inspector for the Corporation of Birmingham.

The health of the inhabitants of a town, like that of an individual, depends upon three leading considerations:

First, a due supply of wholesome and nutritious food, with refreshing sleep; second, proper attention to personal and domestic cleanliness; and lastly, breathing a pure atmosphere. The first is a question between labour and remunerating prices, for the second an adequate supply of water is required, but it is with the latter that the present inquiry is principally concerned. The atmosphere of a town may be deteriorated either by depriving it of its vitalizing properties, or by loading it with impurities of a nature which are injurious to life and health. Against the former cause of deterioration nature has made an ample provision by imparting to the atmosphere a power of equilibration; and in the arrangement of a town it is wise to favour the operation of this law of nature, by forming wide and open streets and squares so as to admit the entrance of fresh atmospherical air. In this respect the town of Birmingham, being built upon the sides of

several hills, is peculiarly favoured. To guard against the second cause it is necessary to provide for the removal of all those matters which, either by themselves or by the process of decomposition, emit impurities into the atmosphere, which render it injurious to health when taken into the lungs. Except the direct poisons there are no substances which have so great a tendency to form these impurities, as animal and vegetable substances, which, in the process of decomposition, emit gases into the atmosphere of a nature exceedingly detrimental to health, and are not unfrequently the direct cause of fevers and malignant forms of diseases of various kinds. It is therefore of the utmost importance to the health of a town that all such matters be readily and completely removed from the surface; where this precaution is neglected there fever and malignant forms of diseases generally prevail. Fever may prevail in a locality where all this precaution has been taken, but where there is an inadequate supply of food for the support of life and health; where the latter cause of fever is in operation, and the above precaution has not been taken, fever of a fatal and malignant character is certain to prevail. The readiest and most effectual mode of removing these matters is by a well-arranged plan of drainage. In those localities where this has not been provided, we see ditches and open spaces filled with foul green-coloured stagnant water, emitting disgusting odours into the adjoining atmosphere. The consequence of this neglect is strikingly conspicuous in the populous and wealthy district of Edgbaston; the part of the Ryland-road and all along the Bristol-road; in the district of Edgbaston, where public sewers are not laid down, the contents of water-closets either pass into the open ditch by the side of the road, or into dumb wells. A short time since one of these wells became overcharged, and it was necessary for the convenience and comfort of the house that it should be emptied. Men were engaged to perform this office for a remuneration of two guineas. On commencing their work, the stench from the well was so horrid and overpowering that they refused to continue their work without a further sum of one guinea being paid them, and a pint of brandy allowed them every hour. These terms were acceded to them, but they again withdrew from their work and could only be induced to renew it by the promise of higher pecuniary reward. In other instances I have known the liquid contents of these dumb wells percolate into the well which supplies the family with water. It is only necessary to point out the dangerous tendency of material of this nature buried only a few feet from the surface of the earth, to show the necessity for means being adopted for removing it from this otherwise salubrious and inviting situation for residences. I place in the hands of the Commissioner a list of places of the same description with those of which I have been speaking, which have come under my immediate inspection; and for further information I refer him to our intelligent Inspector Mr. Bliss. (See Table No. 1.) But these ditches and open spaces filled with stagnant and pestiferous water are to be met with in localities crowded with population, and even close upon a street sewer, where either the cupidity or the obstinacy of individuals prevent the judicious precautions of the Commissioners against such noxious places from being carried into effect. In Bishop-street and at the back of Barford-street is a large open ditch filled with foul offensive

liquid, and which is even destroying the property against which it lies, and yet not five yards from its termination there is a street sewer, into which it might readily be carried. In the list to which I have referred many others of a similar kind are noticed, but being in a more confined and populous neighbourhood are therefore more dangerous. Some of these nuisances have been removed, and others have been mitigated by the Bill for the removal of nuisances. The consequences of the evils of which I have been speaking affect equally the rich and the poor. The putrid exhalations from the foul ditches in the more neglected portion of our town, are carried at the caprice of the wind alike to the houses of the rich and to the more humble dwellings of the poor; all classes are therefore interested in the removal of these certain causes of disease. The one class, it is true, possessing wealth, have the means of removing themselves from these infected spots; but there exists in all large towns a class that cannot so remove, and they are by far the larger portion of the community, upon whose ingenuity, industry, and good conduct, the happiness and prosperity of a country depends. This class, from the nature of their employment, and their means of earning a subsistence, are compelled to live in the town, and it is for their benefit that legislative interference is more especially called for. The working-classes of Birmingham are to be regarded as an intelligent, industrious, and well-ordered community; and, speaking of them as a body, are not chargeable with the vice of drunkenness; but wherever squalidness and extreme degradation is found among them, it is universally traceable to that demoralizing cause. They live principally in courts, and as a general rule each family occupies a separate house. It is to this wholesome distribution of individuals, as opposed to the congregation of families in flats and cellars, that I have always attributed the immunity of Birmingham from fever, typhus in its malignant or aggravated form, as an endemic disease, being seldom if ever met with in Birmingham; where it does locate itself, it is always in the foul and ill-drained parts of the town, and among the dirty and ill-fed portion of the inhabitants. In support of the above statement I subjoin a table of the mortality from typhus in three other large provincial towns compared with the mortality in Birmingham from the same cause; I have taken it from the Registrar-General's table, and have selected the years 1841 and 1842 as those nearest the period in which the census was taken, and, consequently, the years in which an accurate comparison could be made. I have also added a table of mortality from fever in the last three years, which have occurred in my own and that of nine general practitioners in the town (See Tables Nos. 2 and 3). I do not overlook as another cause for this immunity the peculiarly favoured geological position of Birmingham, nor the obligation the town is under to the sedulous care and energy of the Town Commissioners, who have ever exerted a most praiseworthy zeal in behalf of the health and respectability of the town, and had they been endowed with more extensive powers, the necessity for this Commission would never have existed. Many of the courts, more especially of the more modern ones, are excellent in their arrangement. They are wide open spaces, are well ventilated, their surfaces are well levelled and carefully laid with blue brick, or have small gardens before them, which, however, are generally neglected and in a

rueful condition. They are mostly well supplied with water, which differs greatly in its quality. The great defects in the arrangement of these courts is in the mixen and ash-pit, of which I shall have occasion to speak shortly. The rent of the houses in these courts varies from 3s. 6d. to 2s. 6d. per week. But a very large proportion of the courts of this town, more particularly in the older parts, are of a very different description; many of them are closely built, and are narrow and ill-ventilated. They are generally paved with pebbles, some are not paved at all. There is often no attention paid to their level, and where that has originally been well laid down, it has become, by neglect, broken up, so that there are large spaces in which the wet lodges and vegetable refuse matter accumulates. The above observation as to imperfect state of repair is not confined to the court but may be extended to the interior of the dwellings. The drainage of these courts is very imperfect; often the drains are choked up at their outlet so as to be rendered useless. In some courts may be observed perfectly good drains, but the level of the court is so bad that the drains are useless. I subjoin a table, the result of an inspection of 285 courts of the town (See Table No. 4). There is a want of good privy accommodation in these courts, and in some instances there is none at all. The mixen and ash-pit form always one arrangement, the consequence of which is that in a short time the pit becomes full and choked with filth, and being open to the weather it soon becomes filled with liquid stercoraceous filth, which decomposes the mortar and penetrates through the walls, and either flows into the adjoining house or shop or is seen running down the surface of the yard in streams, emitting a foul and disgusting odour into the atmosphere of the court. These are evils alike injurious to the health and morals of the people who reside in the courts. I append a list of 23 of these disgusting nuisances, to which the attention of my friend, Mr. Hodgson, and myself has been directed, as sanitary medical inspectors (See Table No. 5). The powers of the Commissioners do not extend into these courts, and the occupiers are left to the mercy of the proprietors, who are sometimes too poor or too mercenary to remedy the evil, or are often shamefully indifferent to the comforts of their humble tenants. It has occurred to me that it would be desirable that the guardians of the poor should possess the power to purchase these properties from the needy proprietor, or to lend money to put these places and habitations in a fit condition for the health and comfort of the persons who occupy them. A power is wanted to level and drain these courts, and also to compel proprietors to keep them in proper repair when once levelled and drained: for without *this latter power* the other provision will obviously be of no avail. The whole of the mixens and privies require to be reconstructed, and suitable plans to be devised for the removal of the filth and excrementitious matter. Many of the better class of workmen are in the habit of keeping pigs in these courts. The pig is a kind of investment of capital, and the produce of the sale of it is often appropriated to the payment of some debt, probably arrear for rent. These habits of frugality ought not to be lightly interfered with, but the exhalations from the sties, and from the barrels of putrid and putrefying meat on which the pigs feed, tend to render the atmosphere of the court very unwholesome. At present there are

no places appropriated as depôts for the refuse of the town, and it is deposited in large heaps in exposed situations, often in the middle of a dense population. There are three or four of these collections near the town, and the stench from them is very bad. The extreme impropriety of such collections is too obvious to require any comment. When suitable depôts have been formed, it remains to be determined how the manure shall be conveyed to them. There can be no doubt that the readiest and most simple means is by drains, and a well-devised plan of sewerage and flushing. But the source from whence a sufficient supply of water can be obtained to carry away the refuse matter of nearly 200,000 persons is a question to me of great doubt and difficulty. A great quantity of water is daily raised by the various pumps of the town, and I am informed that the water-works company can supply the town with any quantity of water it can require; but the main supply of the water-works is derived from the rivulets and springs in the mineral district. Now, in this district there are large communities of men in villages and towns who will avail themselves of the benefit of the Health of Towns Bill, and will, consequently, divert these streams from Birmingham to apply them to their own purposes. But when the refuse-matter is carried down to the main sewer there still requires the power to convey it to the depôt appointed for its reception. Contrary to the opinion of several experienced engineers, I have great doubts as to the efficacy of the river Rea to effect this purpose. I bear in mind that this sewerage is to be carried on at all seasons, in the summer as much as in the winter months; I also bear in mind that it is not many years since the cattle in the midland districts were driven ten miles to water; and it is not more than three years since the reservoir of the Birmingham Canal, a lake of water two miles in circumference, was so dried up that shells and flowers were gathered from its bottom. Now, if the sewerage fail from a deficiency in the supply of water to carry it away, it will be at a season when its failure will be attended by the most serious consequences. It is possible that the river Cole which is larger than the Rea, and approaches within four miles of Birmingham, may be called in aid of the Rea. The removal of the ordure from a large town is equally important to the health, the morals, and the comfort of its inhabitants. It is, however, attended with many difficulties; and having had my attention frequently called to witness the evils arising from its neglect, I shall venture to state the plans which have suggested themselves to my own mind to effect this object. I do not feel sufficient confidence in any of them to do more than offer them as suggestions to other minds. I have already expressed my decided opinion in favour of the plan of sewerage, both as regards simplicity and completeness; but I am of opinion that decided obstacles will be met with against its being *generally* adopted. In the arrangement of the places for the reception of this ordure the mixed and the ash-pit ought always to be made distinct. The bottom of the ash-pit should be supplied with a drain, covered by an iron grating, communicating with the street sewer. The contents of the privy should be received into a movable iron tank capable of holding a ton, and placed upon rollers, or so arranged that it could be placed upon a truck and drawn down the entry to a low cart made to receive several of these tanks;

they would be carted to the depôt made for the reception of this material, the tank would be cleaned and returned to its situation. It has been suggested to me that these tanks might be fixtures, and built of brickwork, and provided with a plug to which the hose of a dredge-machine might be applied, and that in this way the contents might be drawn into a closed cart and the tank washed and cleansed with a few buckets of water. It has also occurred to me that the surface-water of a court might be made subservient to washing away the contents of a privy. With this view the floor of the privy should be laid on a sharply inclined plane, open at the one end to receive all the surface-water from the drain of the court, the other end should communicate with the underground street sewer. To this arrangement should be added an apparatus for flushing the upper drain, so that in dry seasons a few buckets of water from the pump might be employed to carry away the soil. The management of this plan would be entrusted to one person in the court, who should receive compensation for the trouble by a diminished rent.

The whole of the arrangements suggested by Mr. Russell will be provided for under the powers of the Act. There must be a properly-arranged system of sewers, drains, and water-closets, with a full-water supply; then such accumulations as are named cannot take place. The refuse will be removed as soon as made. Ashes and other insoluble material will be removed once or twice a-week, as the case may be.

TABLE No. 1.—A LIST of PLACES to which my attention has been called in which there are either open foul drains or parts of the town without any provision for drainage, and hence become at times a marshy place, emitting exhalations into the atmosphere. Many of these drains are in densely-populated parts of the town.

Balrall-street Court, Baggot-street, Balloon-street, the whole of Bath-row, Chequer-yard, Barford-street, Belmont-passage, Bishop-street, Bradford-street, 5 Court, Bristol-road, the whole length; Broomsgrove-street Courts, 12 and 13, and the whole district back of Broomsgrove-street; Cotton-street, Castle-street, whole of Club-buildings; Digbeth, Three Tuns-yard, White Lion-yard, back of Cockayne, butcher; Engine-street, Essex-street Court, Flect-street Court, Floodgate-street, 11 Court, Green's-village, Hagley-road, the whole length; Lawley-street, 17 Court, and the whole of the street; Lawley-street, sewer by the London Railway, Lawrence-street Court, 2; Loveday-street Court, 5; Milk-street Courts, 2, 11, 13; Moore-row, back of No. 8; Merceinstreet Court, 6; Myrtle-row, Oxford-street Court, 3; Potter-street, back of 52, and 53; Pope-street, Park-lane, Roland-road, a foul morass at the back; Roland-street; Sheep-street 9 and 13 Court; Sheep-street; Dutton's-court, back of 30; Stamford-street, an open drain without any outlet; Jarster-street Court, 2; Wharf-street Court, 1. The whole district lying between the Pershore-road, over Deritend, and on to the London and Liverpool Railway, and onwards towards Ashted, is very inadequately drained, and many parts are in a highly dangerous state as regards health.

TABLE No. 2.—A TABLE showing the average Number of Deaths from Typhus occurring in the Years 1841 and 1842 in four of the principal Manufacturing Towns in England, taken from the only Reports of the Registrar-General containing the information to which I can obtain access.

1841.	
Birmingham—Number of deaths from typhus	136, or 1 in 1,345
Manechester " "	254, or 1 in 968
Liverpool " "	402, or 1 in 712
Leeds " "	214, or 1 in 710

1842.	
Birmingham—Number of deaths from typhus	159, or 1 in 1,150
Manechester " "	271, or 1 in 896
Liverpool " "	381, or 1 in 754
Leeds " "	194, or 1 in 788

TABLE No. 3.—The following table contains the number of deaths which occurred during three years in my own practice, and in that of nine other friends, all in extensive business in this town as general practitioners. It shows the proportion of deaths occurring from low fever, and also from scarlet fever, and the localities in which the deaths occurred. It is given with the view of corroborating the statement I have made, that typhus in its aggravated or malignant form is not met with in Birmingham. I have not had an opportunity of consulting any public documents, nor do I think such sources would afford much satisfactory information, as typhus frequently occurs in the lower classes from extreme destitution, or it may originate in imported cases from other localities. In the private practice of ten general practitioners, during the years 1846, 1847, and 1848, there occurred 606 deaths, out of which number 33 occurred from fever of a low type, originating in several instances from gastric derangement, 2 of them followed parturition, and 1 was traceable to Irish importation. Of the 33 deaths from fever of a low type, 11 occurred in 1846, 9 in 1847, and 13 in 1848. Of 35 deaths from scarlet fever, one occurred in 1846, 20 in 1847, and 14 in 1848. The scarlet fever prevailed as an epidemic at the close of 1847 and at the beginning of 1848.

The following exhibits the localities in which the deaths occurred:—

Districts.

Aston . . .	Two—viz., 1 in Walmer-lane, 1 at Ashted.
Hockley . . .	Six—viz., 2 at Hockley-hill, 1 in Great Hampton-street, 1 in Great Hampton-row, 1 in Little Hampton-street, 1 in Summer-lane.
St. Paul's . . .	Two—viz., 1 in Water-street, 1 in Livery-street.
Middle of Town	Seven—viz., 1 in Navigation-street, 1 in Union-street, 1 in Park-street, 1 in Cambridge-street, 1 in New Canal-street, 1 in Steelhouse-lane, 1 in Bartholomew-row.
Edgbaston . . .	Four—viz., 1 in Francis-street, 1 in William-street, 1 in George-street, 1 in Frederick-street.
Sand Pits . . .	Two—viz., 1 at Spring-hill, 1 in Leasum-street.

Foreign . . . Ten—viz., 1 in the Green Lanes, 1 in Wellington-road, Handsworth, 1 in Sandy-lane, 1 at Birchfield, 1 at King's Heath, 3 in Lady-pool-lane, 2 at Harbourne. (The 3 in Lady-pool-lane were imported from Glasgow.)

Localities of 35 Deaths from Scarlet Fever.

Districts.

Aston . . . Two—viz., 1 in New Town-row, 1 in Wilton-street.
 Hockley . . . Seven—viz., 2 in Vyse-street, 2 in Bearley-street, 2 at Hockley, 1 in Graham-street.
 Middle of Town Fourteen—viz., 2 in Foredrough-street, 1 in Church-street, 2 in Bread-street, 1 in Snow-hill, 1 in Navigation-street, 1 in Weaman-street, 1 in Cherry-street, 4 in Union-street, 1 in Great Charles-street.
 Sand Pits . . . Four—viz., 1 at Summer-hill, 2 in Leasum-street, 1 at Sand Pits.
 Edgbaston . . . Three—viz., 2 in Reservoir-road, 1 in Fredrick-street.
 Foreign . . . Five—viz., 2 at Handsworth, 1 at Hall-green, 1 at Wilton, 1 at Barsale-heath.

TABLE No. 4.

Page of Memorandum Book.]	Drainage.			Level.			Repair.			Supply of Water			Privy Accommodation.
	Good.	Bad.	Imperfect.	Good.	Bad.	Imperfect.	Good.	Bad.	Imperfect.	Good.	Imperfect.	None.	
1	..	13	7	5	8	7	8	6	4	9	8	2	1 to 6 houses.
2	4	8	5	9	5	3	11	4	2	6	7	3	1 to 5 "
3	15	..	3	14	..	4	17	..	1	14	4	..	1 to 5 "
4	17	..	3	13	..	7	20	..	..	17	..	3	1 to 5 "
5	8	6	7	12	5	4	9	4	8	12	8	1	1 to 4 "
6	5	6	10	5	2	14	8	3	10	12	9	..	1 to 5 "
7	2	12	6	6	5	9	6	7	7	12	6	2	1 to 5½ "
8	9	5	7	9	5	7	11	4	6	14	3	4	1 to 4 "
9	9	5	8	6	3	13	7	2	13	10	9	2	1 to 4 "
10	10	5	6	8	6	7	12	4	5	11	8	2	1 to 4 "
11	13	3	5	8	1	12	15	..	6	15	3	1	1 to 4 "
12	13	6	3	12	4	6	10	4	8	13	9	..	1 to 4 "
13	13	4	4	13	4	4	15	4	2	20	1	..	1 to 4 "
14	13	1	3	14	1	2	10	1	6	12	5	..	1 to 3½ "
	134	74	77	134	49	99	159	43	78	177	80	20	
			74			49			43			80	
			151			148			121			100	

The foregoing table is the result of an inspection of 285 courts in Birmingham, made in January and February, 1849, with the view of ascertaining the state of the drainage, level, repair, supply of water, and privy accommodation. The table may be regarded as a fair average of

the state of the courts of the town, as it embraces the courts in the older as well as the modern parts of the town. The streets which have been visited are the New and Old Inkleys, Dudley-street, Vale-street, Martin-street Five ways, William-street Five-ways, Communication-row Five-ways, Foredrough-street, Park-street, Milk-street, Floodgate-street, John-street, London Prentice street, Bow-street, Smallhoop-street, Hill-street, Tonk-street, Suffolk-street, Gough street, Navigation-street, High-street Deritend, Old Meeting house-yard, Weaman-street.

TABLE NO. 5.

1. Bradford-court, Bradford-street. The liquid contents from two privies percolates through the walls, and enters into two dwelling-houses in Cheapside.
2. Rodway, in Sherlock-street. Liquid manure penetrates into the cellars and even parlours of the houses.
3. Cottage-lane. Two houses in a court rendered untenable by the percolation of liquid stercoraceous filth through the walls.
4. Nelson-street, Court 5. Liquid contents of a privy soak through the walls of an adjoining house.
5. Summer-lane. The contents of a privy in Hospital-street soaks through into a carter's shop, rendering it incapable of being used.
6. William-street North. A wheelwright's shop rendered unwholesome from the liquid contents of a privy in Hospital-street.
7. William-street North, Court 7. A house rendered unwholesome from the liquid contents of a privy in an adjoining yard flowing a foot deep into the cellar.
8. George-street, Court 7. The cellar of a house half filled with this liquid stercoraceous matter.
9. George-street. A house in Court 8 rendered uninhabitable from the same cause.
10. Communication-row. Court 2 rendered unwholesome from the liquid contents of a privy streaming down the yard.
11. Navigation-street, Court 12. Stercoraceous filth streaming down the yard from a privy in Foredrough-street.
12. Henrietta-street, Court 12. Privy manure in a liquid state flowing down the yard.
13. Pope-street, back of No. 4. An open drain, exposing liquid privy manure.
14. Vittoria-street, Court 2. A privy, the liquid contents of which flow through the walls into a casting-shop of Mr. Shepherd.
15. Snow-hill, Court 7. An infamous state of exposed privy manure.
16. Addersley-street. The liquid contents of the privy in this court flows into the cellar of a house in Trinity-street.
17. Smallhoop-street. Liquid contents flowing down the yard from a privy in Suffolk-street.
18. Park-lane. The entrance to the court is covered on its surface with liquid stercoraceous filth from the privy which is situated in the entry.
19. Gutter. Liquid privy manure streams into the yard, close by an industrious workman, from a privy in Thomas-street.

20. Livery-street, back of 100. Liquid contents of a privy, situated in Northwood-street, flows into the yard, and renders the atmosphere so impure that they cannot open the back doors.
21. Oxford-street. Mr. Whitfield's cellar filled with the liquid contents of the manure in an adjoining yard.
22. Henrietta-street. Liquid contents of an adjoining privy penetrates through the walls of a wash-house, rendering it untenantable.

APPENDIX C.

REMARKS by W. HAINES, Esq., and S. BRAY, Esq., Town Clerk.

Mr. *William Haines*, clerk to the Commissioners :

“ Although the history of Birmingham may be carried back to very remote antiquity, long prior to the Conquest, yet a little more than a century ago, a map, then prepared, shows that the town was at that comparatively recent period of very small extent. The lords of the manor however had a grant of a market in the time of the Saxons, which grant was renewed and enlarged by subsequent charters, until ultimately in the reign of Philip and Mary (1555), the present charter was granted to Thomas Marron. It is under this charter that the Commissioners of the Birmingham Street Act now hold the fairs and markets of the town which they acquired by purchase from subsequent lords of the manor.

“ As early as the 9th Geo. III., (1769). an Act of Parliament was obtained, ‘ for laying open and widening certain ways and passages within the town of Birmingham, and for cleansing and lighting the streets, lanes, ways, and passages there, and for removing and preventing nuisances and obstructions therein. By this Act certain Commissioners were appointed, who were empowered to borrow 1,000*l.*

“ In the 13th year of Geo. III., another Act of Parliament was obtained, ‘ for amending the above Act, and for widening certain other streets and places, for establishing a night watch and for regulating carts and carmen employed in the said town.’ By this Act the powers of the Commissioners were enlarged, and they were authorised to raise money by rates on the inhabitants.

“ By the 41st Geo. III. (1801), another Act of Parliament was obtained to alter and enlarge the powers of the two preceding Acts, and for further regulating the police of the said town and the manner of laying out and paving new streets there, and for other purposes. By the 52nd Geo. III. (1812), the above three Acts were altogether repealed, most of their clauses were re-enacted, and more extensive powers were conferred on the Commissioners; and among others the power to pave and repair the streets of the town, which had been previously vested in surveyors annually appointed, was given to the Commissioners. That was the first time they had that power. By the 9th Geo. IV., (May 23rd, 1828,) the powers of the Commissioners were

still further enlarged. By virtue of the last-mentioned Act the Commissioners have purchased the fairs and markets of the town, and the tolls and other emoluments derived therefrom. They have also erected a spacious market-hall, and otherwise improved the market-places in other respects and at very considerable costs. They have also purchased a site, and erected upon it a beautiful and capacious town-hall. They have raised and expended annually very large sums by way of rate upon the inhabitants of Birmingham Proper for effecting the above objects, for widening and otherwise improving various streets, and for carrying on very extensive works with a view to immediate use in the drainage of the town. Since the passing of the last Act of Parliament, May, 1828, namely, in a period of 21 years, the Commissioners have raised by way of rate upon themselves and their fellow rate-payers of Birmingham Proper the following very large sums: In highway rates (during 21 years) there has been raised, on the part of Birmingham alone, 255,949*l.*; during the same period for lighting, paving, drainage, and general improvement rates, including a portion of it, for watching, up to the time the Corporation obtained power for the regulation of the police, there was raised 207,447*l.*; and for the erection of the town-hall they raised rates amounting to 47,825*l.*, making a total of rates collected in the parish of Birmingham Proper alone, without any resort to the outlying hamlets, of 511,221*l.* The parishioners of Edgbaston, Deritend, Duddeston and Nechells, and Aston, have not as such, contributed a single penny towards the above expenditure. It has wholly fallen upon Birmingham Proper."

That the Commissioners have discharged their trust faithfully and honestly, I willingly bear testimony, and from a careful inspection of the work done under their control, I am sure they have acted up to the extent of their power and the existing knowledge of the day, but a necessity for unity of action throughout the borough is felt even amongst them; the large sums of money expended in sewers, from the want of requisite power, does not avail to remove all the evils which exist, and consequently, there are stagnant ditches and open cesspools of the worst kind within 10 feet of some of the finest new sewers in the town. It must also be remarked, that such is the character of the district within the borough boundary, that it would be impossible to carry out perfect sewers and drains otherwise than under one management.

The inhabitants of Birmingham Proper may have expended large sums of money for the especial improvement of the town, but no evil will arise by making, where practicable, such works useful for the whole district; the improvement and prosperity of Birmingham is not only local, it is national. Her magnificent town-hall and organ, for instance, is for the admiration and use of the world.

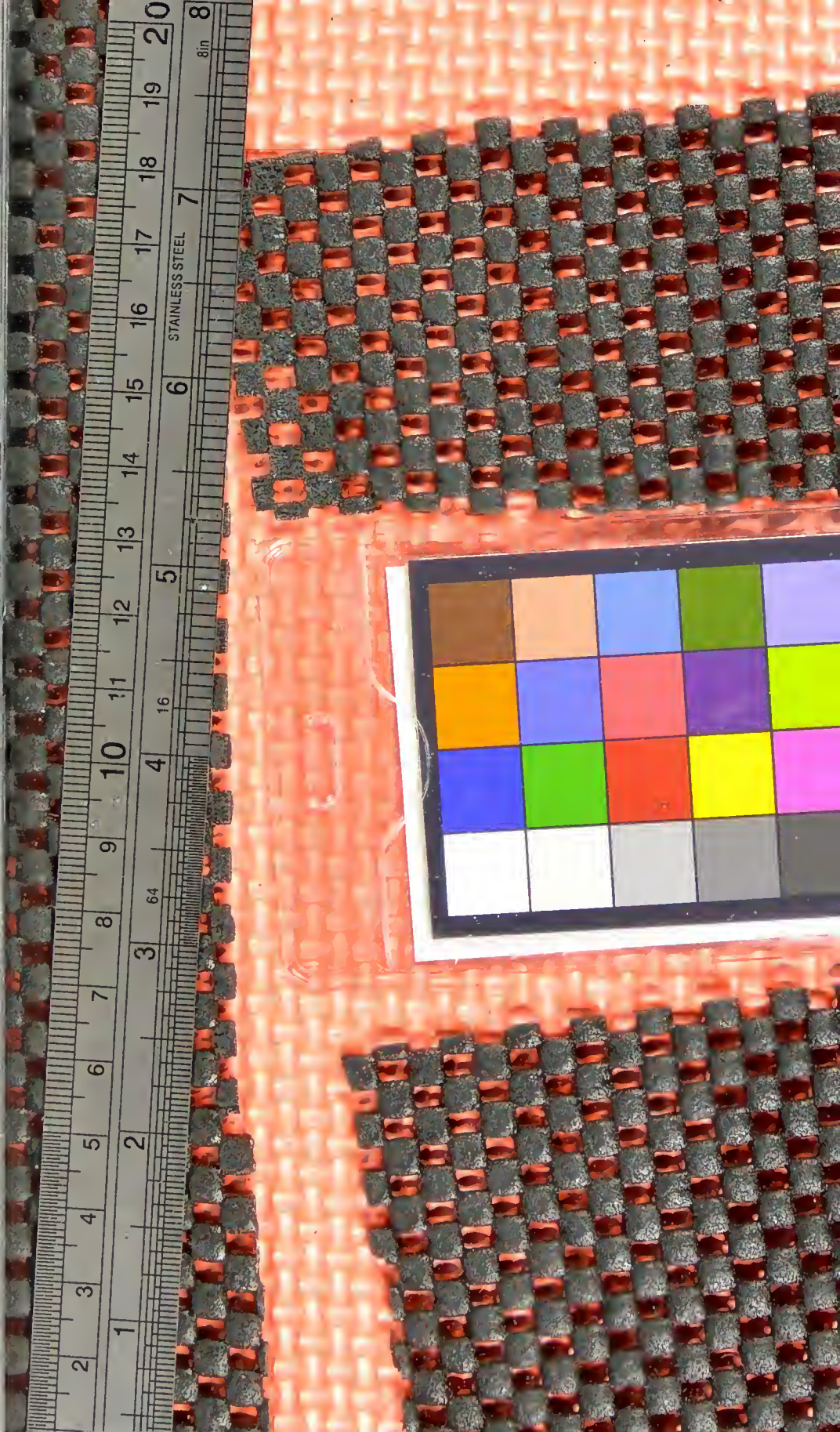
The Town-clerk remarked on Mr. Haines' summary:

"I am not instructed to say one word against the acts of the Birmingham Street Commissioners. I believe, to the extent of their

powers, they have, to the best of their judgment and abilities, rendered great and essential service to the town of Birmingham. I feel bound to make this observation, but it must be borne in mind, that times and circumstances are changed. We have now an incorporation extending the borough far beyond the limits of Birmingham Proper, including two very important and populous hamlets, and including also the very important and extensive parish of Edgbaston. I believe that the object of obtaining the charter of incorporation, was for the purpose of consolidating one uniform management of all the municipal affairs ; to get one local government, elected on the representative principle, and not on the old principle of self-election ; that was the ground on which the charter was obtained, and we have been struggling for the last 10 years for the purpose of carrying out that important object ; and I take this opportunity of saying, that, after very deep and serious consideration of this matter, I am convinced that the interests of this vast manufacturing community will be best served by one representative local Board, extending itself throughout the borough. We are a peculiar people at Birmingham, almost every man is engaged in some trade or occupation ; we are almost universally employed, and it is very desirable, that men so fully engaged, should have perfect confidence in those persons chosen to represent them, and not only so, but should have full power of sending men to represent them who have themselves acquired wealth and leisure by their industry in this their native town, that they should have full power to elect such to take charge of their local interests, and that they should feel a confidence that the affairs of the town are conducted by men representing them ; and by those who may be called on at the proper time to render an account of their stewardship."

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