Report to the General Board of Health on a preliminary inquiry into the sewerage, drainage, and supply of water, and the sanitary condition of the inhabitants of the town of Braintree / by Edward Cresy, Superintending Inspector.

19

PUBLIC HEALTH ACT,

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

REPORT

TO THE

GENERAL BOARD OF HEALTH,

ON A

PRELIMINARY INQUIRY

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

OF THE TOWN OF

BRAINTREE.

BY EDWARD CRESY,

SUPERINTENDING INSPECTOR.

LONDON:
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FOR HER MAJESTY'S STATIONERY OFFICE.

1850.

NOTIFICATION.

THE General Board of Health hereby give notice, in terms of section 9th of the Public Health Act, that within a period not exceeding one month from the date of the deposit hereof, written statements may be forwarded to the Board with respect to any matter contained in or omitted from the accompanying Report on the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the Town of BRAINTREE, or with respect to any amendment to be proposed therein.

By order of the Board,

HENRY AUSTIN, *Secretary.*

Gwydyr House, Whitehall.
19*th February*, 1850.

Report to the General Board of Health on a Preliminary Inquiry into the Sewerage, Drainage, and Supply of Water, and the Sanitary Condition of the Inhabitants of the Town of BRAINTREE.
By EDWARD CRESY, Superintending Inspector.

Braintree, Essex.

MY LORDS AND GENTLEMEN,

THE General Board of Health having been petitioned by 197 rate-payers, out of the whole number of 1290, that a Superintending Inspector should visit the town of Braintree, I was desired to advertise and give the proper notices, which were duly performed; and on the 5th January, 1849, a meeting was held at the Horns Inn of that town at 11 o'clock, to examine and receive evidence upon its sanitary condition, state of the drainage, supply of water, &c. &c. Present:—The Rev. B. Sale, Vicar, &c., R. C. Veley, Esq., John Cummington, clerk to the Guardians, &c., Mr. William Wilson, Mr. Augustus Portway, and several other inhabitants.

It was stated that the number of acres in the parish was, 2,242 acres, 1 rood, 5 poles.

The number of rate-payers, 1,290;

	£.
The gross value of the parish . .	11,706
The rateable value	10,642

The poor-rates for the last year were 5*s.* 2*d.* in the pound.

It appears that the poor-rates from Lady-day, 1832, to Lady-day, 1833, amounted to the sum of . . £2,875 18 2

Land-tax from 5th April to 5th April, same time or year, exonerated . . .	£234	4	0		
Not exonerated . . .	292	5	6		
				524	9 6
Assessed taxes				580	15 2
Surveyors' rate for one year . . .				80	0 0
Duty and compensation . . .				140	0 0
Church-rate (average for 12 years) . .				134	0 0
Lamp-rate 1 year from Michaelmas, 1831 .				93	16 9
				£4,428	19 7

The above rates and taxes were drawn from the inhabitants, which, in 1831, amounted only to 3,422 persons; at that period there were only 708 inhabited houses, occupied by 722 families, 26 uninhabited houses, and five building.

On the 30th November, 1835, Braintree was made the head of a Union under the Poor Law Amendment Act.

The amount of poor's rate for the last seven years, from the Braintree overseers' book, viz., from 1842 to 1848, both inclusive:—

	£.	*s.*	*d.*
1842	2,297	7	1¾
1843	1,986	14	11
1844	2,009	14	9¾
1845	2,040	6	11½
1846	2,149	3	9½
1847	3,029	0	8½
1848	2,680	9	5¾

The roads measure seven miles in length, besides four miles which belong to the Trustees or Commissioners.

The rate for the parish seven miles, is 6*d.* in the pound.

The gas-rate for the houses at 4½*d.* in the pound, and for the land 1½*d.* in the pound.

The parish contract for their gas: they have 24 public lamps, for each of which they pay 40*s.* per annum, and the inhabitants who burn gas pay 11*s.* per thousand cubic feet.

The town of Braintree has adopted the Act for lighting and watching, and although this general Act does not embrace paving, the chief streets have flagged foot pavements which have been laid down by the inhabitants opposite their respective houses.

The government of this town is by a select vestry of 24 parishioners, who, as early as 1584, were styled Governors and Town Magistrates. The population immediately after the Reformation appears to have been but small, and did not recover itself until the Flemings settled here in the time of Elizabeth, when probably the principles of the new government of the town were introduced. The powers which were vested in them are not very accurately defined, but it is evident from the state of the courts, houses, and Crocker's-hole, that they have never directed their attention or control to the points which concern the salubrity of the town, or the health of the inhabitants.

It was constituted by king John a market town, previous to which it was considered a hamlet to Raines, which, at that time, formed a part of the manor of the Bishop of London; of the then number of its inhabitants we have no account.

The number of houses as returned under the Act of 1802 was 454, and the inhabitants 2,821.

In 1831 there were	708	houses, and	3,422	inhabitants.
In 1841	„	786	„	3,670 „
In 1848	„	900	„	4,000 „

Therefore in 1802 we find 6·2 persons to a house.
„ 1831 „ 5·75 „
„ 1841 „ 4·66 „
„ 1848 „ 4·44 „

The increase of cottages since 1802 accounts for the decrease in the number of persons to each house, yet there are quarters in the town where the inhabitants are thickly crowded.

From the registrar's account (Mr. John Cunnington) we find the proportion of births and deaths to have been—

	Births.	Deaths.
In 1842 . .	203	111
1843 . .	196	129
1844 . .	225	124
1845 . .	212	154
1846 . .	193	121
1847 . .	212	173
1848 . .	200	131
	7)1,441	7)943
The average .	205·8	134·714

Or more than 33 per thousand; or 1 in every 30·3 persons.

In 1841, Braintree parish contained 786 inhabited houses, 44 uninhabited, and 1 building; a population of 1,724 males, 1,946 females, making a total of 3,670.

Under 20 years of age, there were 856 males, 917 females; above 20 years, 868 males, 1,029 females. It is to be remarked, that these numbers refer to the entire parishes, a small portion of which, called Rayne Hatch Farm, consisting of about 40 acres, lies in the centre of Stisted parish.

If we examine the rates of births and deaths, as given in the returns of the Registrar-General during the year 1841, for the whole of the registration district, in which Braintree is comprised, and where we have a population of 52,530, we shall find—

The number of deaths were . . .	1,130
„ births	1,702
The proportion of deaths to the population	46
„ births to the population	31
„ deaths of infants under 1 year to the births	7
The proportion of deaths from epidemics.	249
The average age of all who died . .	29·1 year.
„ „ above 20 years of age	58 years.

The proportion per cent. of deaths were as follows :—

Under 1 year . . .	20·6
„ 5 years . . .	36·7
„ 15 years . . .	49·2
„ 20 years . . .	54·2
Between 20 and 30 . . .	6·
„ 30 and 40 . . .	6·
„ 40 and 50 . . .	5·3
„ 50 and 60 . . .	5·2
„ 60 and 70 . . .	6·3
„ 70 and 80 . . .	8·8
„ 80 and 90 . . .	7·6
90 and upwards . .	·5

Now comparing these numbers with the corresponding numbers as we have them given by the Registrar-General, for the district of West Ham, in the same county, we find, that there is an excess in the number of deaths of 225, and also an excess in the number of births of 311.

That the year's loss of life to every individual is seven years, and to every adult one year four months. And it is also estimated that the total loss of money value, of productive labour, at 10*s.* per week for men, and 5*s.* per week for women, or 7*s.* 6*d.* per week for each adult, would amount to 26*l.*

The total loss on the year's deaths has been estimated to be as follows :—

	£.
Sickness	6,300
Funerals	1,125
Labour	13,442
Making a total of . .	£20,867

The approximate proportion of life lost also by each person is one-fifth.

In the Braintree district,—

The total number of adults prematurely dying is	255	
Or to every 10,000 of the population .		48
Number of classes killed by epidemic, endemic, and contagious diseases . . .	212	
Or to every 10,000 of the population .		40
Deaths of all classes from diseases of the respiratory organs	325	
Or to every 10,000 of the population .		62
Proportion of deaths to the population	in 1839, 1 in 50 in 1840, 1 in 41 in 1841, 1 in 46	

Proportion of births to the population	in 1840, 1 in 31 in 1841, 1 in 31
Proportion of marriages to the population	in 1840, 1 in 147 in 1841, 1 in 143

The high rate of mortality we observe in this town, at once compels us to endeavour to discover the physical causes which have produced it; and in Mr. Farr's letter to the Registrar-General, Fifth Report, p. 418, we find ample solution; for—

"Every population throws off insensibly an atmosphere of organic matter, excessively rare in country and town, but less rare in dense than in open districts; and this atmosphere hangs over cities like a light cloud, slowly spreading, driven about, falling, dispersed by the winds, washed down by showers. It is not *vitalis halitus*, except by origin, but matter which *has lived*, is dead, has left the body, and is undergoing by oxidation, decomposition into simpler than organic elements. The exhalation from sewers, church-yards, vaults, slaughter-houses, cesspools, commingle in the atmosphere, as polluted waters enter the Thames; and notwithstanding the wonderful provisions of nature for the speedy oxidation of organic matter in water and air, accumulate, and the density of the poison (for in the transition of decay it is poison) is sufficient to impress its destructive action on the living, to receive and impart the processes of zymotic principles, to connect by a subtle, sickly, deadly medium, the people agglomerated in narrow streets and courts, down which no wind blows, and upon which the sun seldom shines."

Here the accumulated night soil from 4,000 persons, passes along alleys, lanes, and open ditches, amidst the habitations and walks of these human beings who must feel annoyed, though they may not complain, at the polluting and odoriferous exhalations they are surrounded by. There are no sufficient sewers to carry away this pernicious matter, which frightfully increases the victims of disease; there is no sufficiency of pure, sweet, and wholesome water, which ought abundantly to flow into every dwelling, court, alley, and street. At present, inhabitants of the dwellings of the lowest classes in this town, have neither air nor drink in a wholesome condition; the consequence naturally arises that they lose speedily their vigorous digestive powers, and cannot eat the coarse but wholesome diet prepared for them, or if they do they cannot digest it, and soon fall into the habit of seeking more stimulating food, which unfits them for labour, and eventually destroys the little stamina they had.

Towns like Braintree, where manufactories are established, require more than ordinary care to prevent the atmosphere from being saturated with impurities, and also that the courts and smaller dwellings should not be overcrowded; wherever this is permitted, we find small shops established where their food is retailed out, often in a very deteriorated condition, if not in such a state that might be deemed unfit for human beings to eat.

Wherever a village of agricultural labourers has been converted

into a manufacturing town, we find that the changes produced for the accommodation of an increasing population have usually been effected without any regard to what is absolutely essential for their health or convenience. How different must have been the external character of our smaller towns previously to the introduction of a manufacturing class from the shores of France, or from the Low Countries. Around the great workshop, houses were erected to receive every additional family who, accustomed to the privations and miseries attendant on persecution, cared for little else but the means of procuring their daily bread in peace, and a shelter from the inclemency of the weather; neither drainage nor a sufficient supply of wholesome water existed, or if there were streams, their purity became contaminated by being turned into reservoirs of filth; or if possessing any power to turn machinery, they were appropriated to that use, and their natural direction in many instances entirely changed. Such at least seems to have been the case with this town; and we find by its history, as recorded by one of the inhabitants, that it has frequently been the seat of plagues, and of diseases arising from neglect of cleanliness; and the condition of several ditches almost excite a wonder that this frightful pestilence is not again depopulating the town.

The earliest epidemic in Braintree of which we have any account, happened soon after the desertion of Britain by the Romans, when a contagious plague fell so outrageously among the Britons, and, without the sword, swept off such numbers of them, that the living could scarcely bury the dead.

The next was in 1348, when this town seems to have suffered in an equal proportion with London, where 100,000 persons fell a sacrifice. Between this time and 1665, it appeared no less than five times, at intervals varying from 215 to 11 years. There is an account of plague having visited Braintree in 1571 (see Mr. Dale's extracts), which does not well correspond with any of the periods of its prevalence in London, the nearest of which was 1563; so that supposing it to have broken out in London at that time, and to have spread itself into the country, it must have been eight years in reaching Braintree; it must therefore either have been local, or independent of London, or it did not at this period spread so rapidly as afterwards, when from the increasing manufactories, communication with the metropolis was more frequent.

It would seem also, from the following extracts, that the town was visited by the plague in 1640, in which year a great number died in London of that disease. It is recorded at—

"*Mr. Burnett's Meeting, held in this town, September* 7, 1640.—Imprimis, at this meeting every man paid for his own dinner, and Mr. Burnett had promised to give the poor what charges his dinner should amount to, the town being visited at this time with the *sickness*, he afterwards paid 40*s*.

"*February* 1*st*, 164$^{0}/_{1}$.—Item, we agree that Mr. Walford shall have 20*s.* for his paynes in going into Thomas Byrd's house when he was visited by the sickness, at the towne's request, and this money is to be paid him by the constables."

Of the extent to which the last great plague in 1665-6 affected Braintree, many details are preserved; and principally in a curious memorial on parchment in a gilt frame, which hangs in the vestry. It sets out with an account of the charitable contributions to meet the distresses consequent upon the disease, which were as follows:

Charles Earl of Warwick gave two bullocks a-week all the time the plague lasted, which was from the 8th September, 1665, to the 15th of September in the next year; and for maintaining a doctor and an apothecary £12

Lord Maynard 30 sheep, and in money . .	10
Mr. Leggatt	10
The inhabitants of Coggleshall . . .	35

Besides which Robert Carr, minister (the vicar), and John Sumners, Esq., are mentioned as great benefactors.

Captain John Fitch, clothier, and William Wilkinson Barker, chirurgeon, were overseers all the time it lasted.

And it moreover appears, by the proceedings of the "Four-and-twenty," that Sir Andrew Jenner contributed . . £21

And Mr. Carr, the vicar, brought in money received him in the time of sickness . . .	10
And afterwards upon the same account . .	25

Then follow the names of the families visited by the plague, amounting to 286, and the number of persons affected in each family, which in one instance amounted to 10, and it then gives this summary:—

People visited and died of the plague . .	665
People visited only	22
In all both visited and died . .	687

showing that not 1 in 30 of those attacked recovered.

Dr. Salmon states that more than one-third of the inhabitants were cut off.

The register of the period is extant, and "Old Beckwith received from Captain Fitch 20*s.* for registering the deaths of this time."

(See Capans Lives of the Bishops of Bath and Wells, for accounts of the plague in the west of England.)

In early times this town entirely depended for its support on the numerous travellers and pilgrims going to the shrine of St. Edmund, or our Lady of Walsingham, it being situated on the high road between London and those hallowed spots in Suffolk and Norfolk; the remains of several large inns indicate that the traffic was very considerable. In the early part of Elizabeth's reign, we find an

Act of Parliament passed (1 Eliz. cap. 14), in which several towns in Essex were permitted to manufacture cloth, and among them Bocking is mentioned as a clothing town; and from the names of several families still existing, we may infer that in the same reign many of the Protestant manufacturers, both from the Low Countries and in France, settled here, after they were driven out by the Duke of Alva and the oppression of the Huguenots, some of whom probably introduced the baize and serge manufacture, and laid the foundation for those of crape and silk, which now afford so much employment as to lead to the expectation of some degree of comfort and respectability among that class of the inhabitants so employed, which however is far from being the case.

The cottages are in a wretched condition, they are built closely together, and many without ventilation, having no openings at the back; all the refuse being carried out and deposited in the street, over the first grating that offers. They are generally built of timber and plaster, or with brick, and indicate considerable age. Some have cellars that cannot be drained under the present arrangements, as all the sewers which exist are considerably above their level.

There are many yards and courts which appear to have belonged to the large inns or hostelries, now divided into small tenements, but without any proper arrangements, for a supply of water or accommodation for sewage. Many of them have but a single privy, and that placed over an open and fœtid cesspool, cleansed only by manual labour, and situate in the midst of a dense population.

In the towns formerly occupied by an agricultural population, and afterwards adapted to receive an increase of artizans and manufactories, it is universally the custom to convert old and decayed manor-houses or other buildings of any extent into a number of dwellings; but the requisite attention to sewage, ventilation, and other accommodation demanded by the increased number of inmates seems quite forgotten, and they are left to make the best arrangement they can for themselves, when in fact the most careful supervision should be exercised by the proprietors. The large cesspool of the mansion soon becomes a pestilential accumulation, and when made to serve the wants of perhaps an hundred families, the atmosphere of every tenement is infected. No such changes should be permitted without some responsible supervision. In the erection of small houses attention should also be paid to their being arranged regularly and at sufficient distance from each other, to allow a free circulation of air and the admission of the sun's rays, the first condition for preserving the inhabitants in a healthy state; and with a sufficient supply of water, accompanied with proper drainage, such healthiness will be secured, at least as far as human means can be exerted. If dwellings of this character were erected, we should now be relieved from the sight of the

decaying thatch, the only covering to low and ill-contrived rooms, which ought not to be called habitations, for which 1*s.* a-week is charged, a sum that might procure a dwelling free from all the pollutions which exist generally in this town.

Forty-eight cottages are as many as should be permitted at any time to be built upon an acre; and in laying out land for the purposes of building, some control should be exercised upon this subject; the cottage of the present day has usually 12 feet or 4 yards in frontage, 7 yards in depth, and is about 10 yards high to the top of the chimnies. The street should consequently be 10 yards wide, to ensure proper ventilation and a due admission of light and air; 5 yards to the middle of the street, 7 yards for the depth of the houses, and 13 yards for its garden or back premises; in all $25 \times 4 = 100$ superficial yards, which would allow 48 houses to be placed upon each acre of land.

At present the houses in the town are so closely packed, that nearly double that number stand upon an acre, and in many of the courts nearly treble.

The town and its immediate suburbs at present occupy an area of perhaps about 10 acres, without taking into consideration the extensive fields near the railway station, laid out for building. Of these 10 acres the houses and buildings may be supposed to occupy 28,400 square yards, and the streets and alleys 20,000, averaging about 12 square yards to each individual of the population.

Wherever there is an opportunity to build, and the demand for labourers' cottages great, the return for an outlay is so considerable, that for the ground to be so disposed of in the vicinity of a large town, there are always small capitalists ready to cover it; but as with them it is a mere matter of investment, distinct from any more important consideration, it has become a serious necessity that some authority should be exercised to produce a state of things more consonant to the growing feeling of the age; and it is unquestionable, that if builders would carefully attend to the provisions of the Public Health Act, they would find that while erecting dwellings, fitted for all the wants of their fellow-creatures, they would be really benefiting their own interests, inasmuch as the greater comforts provided would induce in the inmates a greater degree of attachment to their dwellings, and a consequent desire to maintain those comforts in their original state, and fewer repairs would be required.

To adapt 10 cottages to all the requirements of the new Act, will not occasion an expenditure of more than from 45*l.* to 50*l.*, a sum often charged for sinking a well and putting up a pump; and the annual charge for an abundant supply of water will be comparatively small, seldom if ever amounting to 6*s.* or 7*s.* for each house, and the tubular drainage will of course be infinitely less costly than the usual 9-inch barrel drain.

This town is admirably situated for all the purposes of drainage,

and for an abundant supply of pure water; it now communicates by a railway, *viâ* Witham, with the metropolis, and there is every reason to expect, that the land around the railway station, which is to be disposed of in small plots, will soon be taken by builders, and it will be a matter of regret, if in the several streets which are set out, a better arrangement for the supply of water and sewage be not made than is usually observable for the smaller class of tenements.

The town is placed upon the side of a hill, whose ridge forms the upper part, the ground falling on both sides, and very rapidly, towards the rivers at no great distance from this high ground. One of these rivers is the Pant or Blackwater (the Indumania of the Romans), the Hoppitt, which afterwards flows on to Witham. In Domesday-book the town is called Raines and Branchtrue, the former probably of British, the other of Saxon derivation. Morant, in his history, seems to think the latter name signifies a town on a rising hill, "or the bank between two rivers," which bank separates Bocking from Braintree. From the road which traverses its summit, a view is obtained over the two towns, as well as through their respective valleys, which are fertile pastures of no great width.

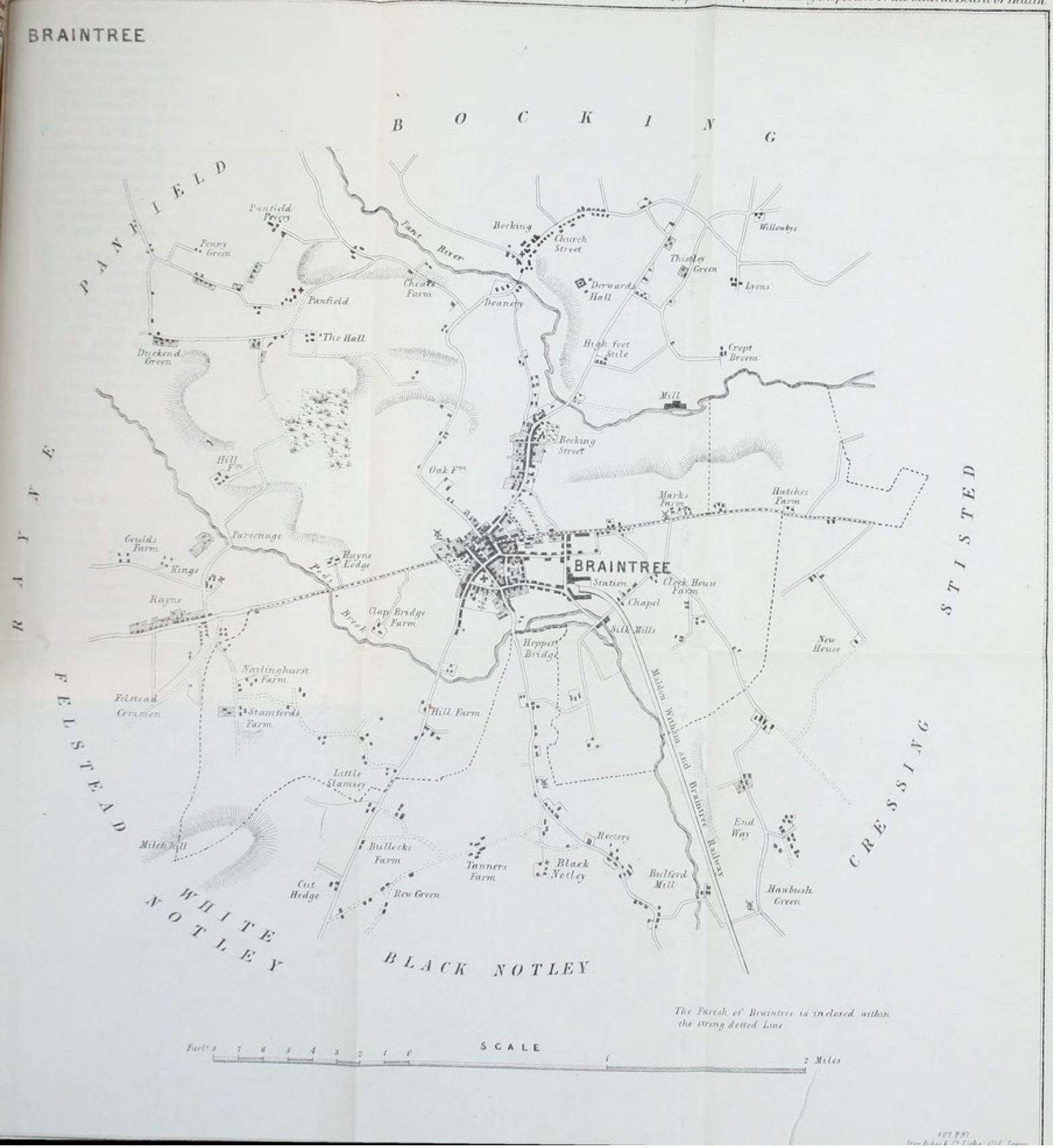
Drainage at present.—We shall now proceed to detail the condition and present state of drainage. There is a flat-bottomed brick drain 21 inches wide, covered with a segment of the same material, which runs from near the Horse and Groom public-house in the Raine road, continues by Sandford's Pond-lane, then on the north side of the churchyard wall, passing the vicarage, down Pond-end, to the bottom of Hodges garden; discharging itself into a celebrated ditch called Crocker's-hole, which receives all the filth of the town. This drain about 30 years ago was an open water-course.

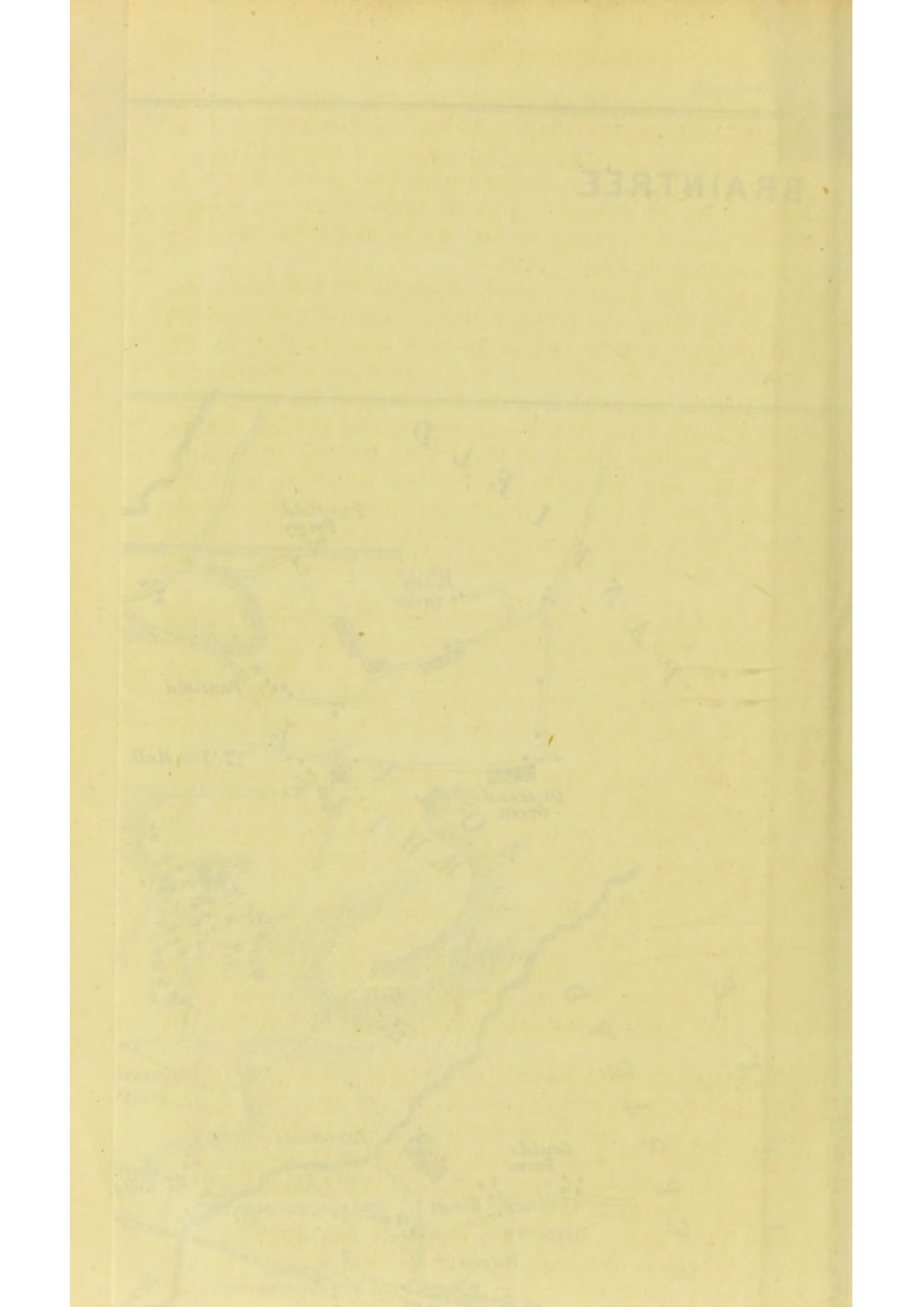
Another brick drain, with a flat bottom 9 or 10 inches wide, covered with an oak plank, is placed a few inches only below the surface of the road, it commences somewhere in New-street, passes through Back-lane, across the great square, under and through several gardens, at the back of the gas-works, where it receives the ammoniacal liquor, and a little further, or under the large 21-inch drain above described, at a place called Pond End.

The privies connected with these two drains are all without cesspools, and discharging their contents at once into them: the consequence is truly disagreeable, every place being infected by the noxious gases, which arise from the putrid matter they contain. No flushing ever takes place except during heavy rains, when the sewers frequently burst; and the effects are deplorable in the streets as well as in the houses.

Another brick drain commences at the back of the Freemasons' Lodge, in High-street, passes near the office of the registrar, then

BRAINTREE


BOCKING
PANFIELD
RAYNE
FELSTEAD
WHITE NOTLEY
BLACK NOTLEY
STISTED
CRESSING
Panfield Priory
Penny Green
Panfield
The Hall
Duckend Green
Cheats Farm
Pant River
Becking
Church Street
Deanery
Derwards Hall
Thistley Green
Willowbys
Lyons
High feet Stile
Crept Breem
Mill
Becking Street
Oak Fm
Hill Fm
Marks Farm
Hatches Farm
Parsonage
Geulds Farm
Kings
Rayne
Rayne Ledge
Pads Brook
Clap Bridge Farm
BRAINTREE
Station
Clock House Farm
Chapel
Silk Mills
Heppitt Bridge
New House
Maldon Witham and Braintree Railway
Naylinghurst Farm
Felstead Common
Stamfords Farm
Hill Farm
Little Stamsey
Milch Hill
Bullocks Farm
Tanners Farm
Black Notley
Rectory
Bulford Mill
End Way
Hawbush Green
Cut Hedge
Row Green
The Parish of Braintree is inclosed within the strong dotted Line
SCALE
Furl's 8 7 6 5 4 3 2 1 0
1
2 Miles



down New-street, under Mr. Watson's premises, and afterwards unites with the other drains before mentioned in Pond-street or at Pond End. This last drain is also flat-bottomed, about 14 inches wide, and 9 inches high, it is covered with oak plank, which is only 3 inches from the surface. A small drain from the King's Head runs through the passage of Mr. Nash, and falls into that on the north side of the churchyard.

Crocker's-hole, the level of which is about 30 feet below the upper part of the town, and perhaps 50 feet above the river, which flows to Witham, is a wide chasm cut in a gravelly soil, to the depth of from 15 to 20 feet, with a rapid fall; it evidently has been a watercourse, through which the Rayne-road, the Back-lane, High-street, Church-lane, New-street, and several private drains, originally open ditches, united at Pond End, flowing afterwards, as they do now, into this sink of pollution, which is rendered worse by being dammed up, to obtain the contents for the benefit of a garden of about three acres on its banks, in which are several square rods of pond and filth, amidst cottages inhabited by the poorer classes.

In the Hyde-field row, it was stated that there were 11 cases of typhus fever. The lower part of this place has an open offensive ditch, into which all sorts of nuisances are emptied, the cottages being literally without any accommodation whatever, and these poor people pay from 1*s.* 6*d.* to 1*s.* 9*d.* per week, for two or three small and miserable rooms.

The Raine-road, which forms a part of that which passes from Dunmow to Coggeshall, is situated at the north-east side of the town; it takes a direction from the north-east to the south-west, and in the middle is the division between the parish of Bocking and that of Braintree.

At a short distance from Braintree, on this branch of the road, which conducts to Dunmow, and in the parish of Bocking, stands the new Union workhouse. The ground story of this building is sunk below the natural level of the surrounding soil, and occasionally the water from the several yards must find its way into the rooms.

All the privies and other drains are carried into two open ditches which discharge themselves into another, on the Braintree side of the Dunmow-road; at this ditch commences the pollution which is afterwards suffered to flow onwards towards the town, and seems to run afterwards down Back-lane, then joins the drain in Church-lane, and flows onwards to Pond End.

The ditch which passes from the Union at the upper part of the town, it should be observed, receives all that drains from the Raine-road, where there are several privies and pigsties close to the road-side.

In Drury-lane and Little-square, in the very heart of the town, near Bankside, and the great square, there are slaughter-

houses, lodging-houses, miserable dwellings, pigsties, and ope ditch cesspools, uncovered, but with the chamber story of old timbered houses in several cases projecting over them. Severa of these open cesspools, for the receipt of every kind of putri matter, are only separated from the road, by a 9-inch wall carrie up to the height of 3 or 4 feet.

The privies belonging to the houses of this quarter of the town are all placed over the small drains already mentioned, and sen their pollution through, and under the neighbouring house gardens, yards, &c., into the several other drains which ru towards Crocker's-hole.

Several of the dwellings of the poorer class in the town are o the worst construction; old timber houses covered with a coat o plaster in a rotten and decaying state, many without either water o conveniences. There are other cases where there is only one con venience to a dozen families.

For a more particular description of the streets, and the direc tion of the present four drains, which are perfectly inadequate fo the purpose of carrying off the water from the cellars, see th two plans, where they are expressed by dotted lines.

In general, the better class of houses are without water-closets and those belonging to tradesmen are almost as badly accommo dated as those of the poor inhabitants. Every iron grating ove the gulleys from the open and surface gutters, exhibits in all part of the town very unpleasant evidence of these inconveniences, and it is no uncommon thing to see even respectable persons openly removing from their dwellings matters for which less public re ceptacles are usually provided.

In the summer-time, as there is no water to flush these im perfect drains, the stench and inconvenience must be, as described quite unbearable.

There are not any resident gentry or independent families in this town; we may suppose, therefore, that the tenantry have been un accustomed to any supervision, and consequently have been unwill ing to improve the property of their landlords.

Bocking joins on to Braintree, and many of the houses belong ing to it ought perhaps to be comprised in the arrangements for improving the condition of Braintree, but as the street leads from the latter place towards Bocking-bridge, over a different river, and the fall is equally favorable to a system of inde pendent drainage, this parish had better probably be left to itself. All the houses at Bocking seem of a better character than those of Braintree, and are inhabited apparently by a superior class of persons.

SEWERS PROPOSED.—The fall from the upper part of the town towards the lower being so considerable, a small-sized sewer only is required; 10,000 running feet in the rear of all the habitations

s sufficient effectually to carry off all that would be discharged nto it. A back drainage is always to be preferred where it can ›e so easily obtained as in this town, the oldest sewer passes in he rear of the houses in New-street, and falls towards Pond End; ›ad and defective as it now is, before the great increase in the town t might have answered its purpose; but this increase must now ›e provided for, and some means adopted more consonant to the vants of the present generation.

It is generally allowed that nothing would be more desirable than to free all the rivers and streams from pollution; this object can only be attained by directing the various nuisances which are the cause of it into some other channel, not by accumulating a quantity in the upper portions of the town, and leading it away to one central point, but conducting it through smaller drains so constructed, that no effluvia can escape, and it is presumed that the matter so collected will be readily purchased by the farmer, and a fund thus formed which would contribute towards the expense of management, and interest of money expended.

£3000 would be ample to accomplish this part of the arrangement, and give every house a perfect and efficient discharge for its drainage.

The data from which the calculations are made, which induce the expectation of the important return alluded to, are given on the authority of some of our best experimental chemists, who have stated that the liquid and solid excrements from a population of 4,000 inhabitants would annually amount to 980 tons, or 1½ lbs. daily from each individual. Thus sufficient matter might be obtained from the town to manure 4,000 acres of land, as there is found to be in the quantity stated, 586 cwt. of nitrogen, besides the phosphates. This valuable manure has in England been much neglected, from the difficulty of removing it, and the expense attending its collection. The wages for these operations are always high, and the covered waggons proper for the purpose are rarely possessed by the farmer; some method must therefore be adopted by which the moisture can be thrown off without permitting the escape of the ammonia, and in such a dry state it would be as easy of transport as guano.

Wood ashes, or earths which contain caustic lime, and which are commonly used to destroy the smell, also expel the ammonia which is so valuable, and the phosphates are alone retained. Peat earths or some mineral acid are the best neutralizers of this matter.

Water Supply.—The houses are generally supplied from pumps. The wells vary in depth, some exceeding 40 feet. The water is exceedingly hard, and in many places affected by the drainage, which being suffered to filter away, naturally occasions much organic matter to descend to the stratum, from whence the

pumps draw their supply. In several instances old wells are actually converted into cesspools, which, by their proprietors are considered an unusual advantage from their not requiring any cleansing.

The water is drawn from the gravel, and probably from a run of fine sand, which lies upon a bed of clay, or where the gravel immediately unites with it; of course, its supply is by percolation, and after rains it is more abundant. Any organic matter poured at once into any part of this layer, must sensibly affect the condition of the water, and be pumped up at the nearest well; it is hardly possible to comprehend, how any one in the present day, possessed of two wells, within a few yards of each other, could expect to draw pure water from the one when the other is converted into a receptacle for all that is filthy.

The land around the town abounds with springs, and in the parish of Raine the water appears to be clear and pure; at a distance of less than a mile from the high street, any quantity required might be obtained: and collected at such an elevation as to need little engine power.

For each house to have a proper supply of water, with enough also, at the disposal of the Local Board, for flushing the sewers, 40 millions of gallons annually would probably be required.

An acre of land would, in the course of the year, upon an average, receive 2,700 tons of rain-water, or 648,000 gallons, 57 parts of which probably are carried off again by evaporation, the 43 passing through the soil by percolation to feed the springs, from whence the pumps draw their supply, and the streams receive their tribute.

By draining the gravel it is fairly presumed that 250,000 gallons per acre might be collected; 160 acres would therefore produce the quantity required and of the purest quality; where gravel lies immediately on the clay it holds water like a sponge, as the subsoil does not absorb it, and at an expense of something more than 4*l.* per acre all the water could be collected and conveyed away, leaving the soil in a far better condition for agricultural purposes, and consequently of greater annual value.

Wherever there are springs near the surface, as in the neighbourhood of this town there can be no difficulty in getting a *gathering ground* for an abundant and constant supply, and upon the most moderate terms. Presuming the expense to be 4*l.* per acre, and 160 acres required to be so treated, the cost would amount to 640*l.* The annual charge upon which an improvement rate or rent for 20 years would scarcely exceed 52*l.*

In the courts where houses are closely packed together, and where there is but one privy, or, as in some instances, not any, it will be necessary to construct one for each sex, with proper earthenware pans, syphons, and tubular drainage pipes, with water sufficient under proper management to pass off the entire contents of

the pan. It cannot be too frequently observed how important such arrangements are in the habitations of the labouring classes, not only rendering them wholesome, but checking, in some measure, the grossness of manners so frequently complained of.

Malaria should not be generated either within or without the cottage, and having freed the atmosphere from every impure exhalation, it then becomes a duty to impress upon the minds of the young of both sexes the respect due to cleanliness, the importance of observing it, both physically and morally, and the value of being free from any habit that indicates a want of decency and self-respect.

The advantages of a proper water supply cannot be estimated too highly. For cleansing purposes alone it is a great economy. Supposing, for instance, that there are 20,000 square yards of street, road, and courts, to be properly swept by scavengers, at 1*s.* 6*d.* per day, and that this is performed once a-week, as 1,000 yards of sweeping per day is considered good work, 20 days will be required for the purpose; the weekly charge for this labour being 30*s.*, will amount in the course of the year to 78*l.* With a hose-pipe, where the water is delivered under pressure, the 20,000 superficial yards of street would not require more than that number of gallons of water to carry off all the accumulated dirt, rendering the place more healthy and clean than could be done by the former process, and the cost would not amount to a fourth. Another advantage would be that the fronts of the dwellings could occasionally be cleansed in the same way, which would be found highly beneficial, particularly in narrow courts and crowded lanes.

Gas Works upon a limited scale are situated within the town. At present the charges are high, which probably accounts for the small demand for gas by the inhabitants, who thus prefer the old mode of lighting, when on the score of economy there is no inducement to change.

The coals required to heat five retorts, when under the influence of one fire, is only one-third of what is necessary when each retort is heated separately; it must not, therefore, be expected that a small establishment can manufacture gas at a sufficiently low rate to induce its general introduction. In this, as in most other instances, the demand will follow the supply; let it once be proved that there is economy as well as increased light in the consumption of gas, and it will be readily adopted; but this can only be effected by liberal and scientific measures on the part of the Companies of any kind, and they would always find that a ready adoption of every improvement in their manufacture would be beneficial to themselves, as well as to the community.

Supposing the average consumption of candles to be nightly 172 lbs., one retort charged with 1½ cwt. of coal four times in 24

hours would produce sufficient gas and more to equal the light of the candles; but the cost of making so small a quantity would be so great as not to allow the manufacturer to charge less probably than the cost of the candles.

But if works upon a different scale were established, and public and private lights were demanded, and every other light was abandoned, then a vast saving would be made.

The BOUNDARY PROPOSED for the application of the Public Health Act is indicated upon the annexed plan, and having maturely considered the state and condition of the town of Braintree, and examined the streets and alleys where most prevail those endemic and epidemic diseases which are destructive of human life, I am of opinion that it ought immediately to have applied to it the provisions of the Act, in order,—

1. To do away with all cesspools, open ditches, surface drains, and to have in lieu a perfect back drainage, by means of earthenware tubes and pipes. These should be duly proportioned to their situation, fall, and quantities of refuse to be discharged; the whole of the water and other matters, conveyed by a perfect system of earthenware sewers, should be conducted to such convenient and properly selected quarters of the neighbourhood where covered tanks may retain it, until used by the farmers or gardeners, who may be acquainted with its value. These situations are denoted on the plan, but they may be prolonged to a greater distance if required; no drainage whatever, that is of a noxious quality, or calculated to pollute the streams that flow near or about the town, should be permitted to enter and render impure the water which flows to other villages and towns, where it may become injurious to health, or useless for domestic purposes.

2. To do away with all open privies, and that in lieu, there shall be substituted pan-closets and traps, with earthenware pipes properly jointed, and connected with the earthenware sewer; that all sinks, urinals, and other drains, be directed into the same sewer by means of similar earthenware tubing; that all the rain-water that falls upon the roofs or yards be conducted away by means of earthenware pipes, in such a manner as the Inspector under the Local Board may direct; and that there may be ample means provided to scour, cleanse, wash down, all streets, alleys, pavements, roads, &c., where there are habitations, and to remove all slaughter-houses.

3. To open all courts where practicable, and afford a thorough transit and ventilation, and to prevent any cottages being improperly constructed.

4. To provide an abundant and efficient supply of pure and wholesome water for domestic purposes, as well as for washing and cleansing; that fire-plugs be properly placed, and that the pipes be constantly charged with water.

5. To dispose of the ashes, refuse matter, manure, and sewage waters of the town, so that they may be sold to the greatest advantage, and the money so obtained be applied to the working of the Act under the Local Board; that the several streets and alleys may be paved or gravelled, and maintained in good condition.

6. To place the whole town under one and the same Local Board, to consist of nine persons, who may have the management of all matters that are within the scope of the Public Health Act.

In concluding, I am of opinion that the health of this district will be most materially improved when these sanitary measures are applied, and the inhabitants will generally find that a great saving will be the result over what now constitutes their expenditure, for cleansing out cesspools, privies, ordinary repairs of drains, wells, pumps, and scavenging. What is the duty now of individual landlords is rarely performed, because it is costly and acts as a diminution of their rents. Under a Local Board the poorer classes will have the opportunity, and I hope certainty, of having removed from their dwellings all that can pollute the senses, or destroy the common habits of decency now so outraged; also of having an abundant supply of wholesome water, an atmosphere less tainted with poisonous gases, and streets and alleys where the inhabitants may move, without being surrounded with dirt and nastiness of every kind.

With the greatest respect.

My Lords and Gentlemen,

I remain yours obediently,

EDWARD CRESY,

Superintending Inspector.

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

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