

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 Exmouth / by Thomas Webster Rammell, Superintending Inspector.

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14
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 TOWN OF

E X M O U T H.

By THOMAS WEBSTER RAMMELL, Esq.,

SUPERINTENDING INSPECTOR.



LONDON:

PRINTED BY W. CLOWES & SONS, STAMFORD STREET,

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 EXMOUTH, or with respect to any amendment to be proposed therein.

By order of the Board, :

HENRY AUSTIN, *Secretary.*

Gwydyr House, Whitehall,

Jan. 28, 1850.



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 EXMOUTH.
By THOMAS WEBSTER RAMMELL, Esq., Superintending Inspector. 1849.

London, 25th October, 1849.

MY LORDS AND GENTLEMEN,

A PETITION having been presented to your Honourable Board, from more than one-tenth of the inhabitants rated to the relief of the poor of the town of Exmouth in the county of Devon, and praying for inquiry, with a view to the application to the town of the whole of the provisions of the Public Health Act, 1848, your Honourable Board was pleased to direct me to visit the parts for the purpose of making a preliminary inquiry, according to the terms of the Act, and with respect to the matters following, viz.:—

The sewerage, drainage, and supply of water;

The state of the burial grounds;

The number and sanitary condition of the inhabitants;

The local Acts of Parliament (if any) in force within the town for paving, lighting, cleansing, watching, regulating, supplying with water, or improving the same, or having relation to the purposes of the Public Health Act, 1848;

The natural drainage areas;

And the existing municipal, parochial, or other local boundaries, and the boundaries which may be most advantageously adopted for the purposes of the Public Health Act, 1848;

And also as to other matters with respect to which your Honourable Board was desirous of being informed.

In pursuance of these directions, I caused the proper notice to be issued for a public meeting to take place at the Globe Hotel in the town on the 5th of February last; and on proceeding on that day to the appointed place, I found present a

very full attendance of the influential and respectable inhabitants. Amongst these were the Rev. S. J. Rocke, vicar of Exmouth; the Rev. J. W. T. Lee, incumbent of Withycombe; Sir Henry Browne; Mr. W. Cole Cole; Mr. W. H. Hull; Mr. T. M. Eustace; Mr. W. H. George; Dr. Kane; Mr. Trenchard, solicitor; Messrs. Spettigue, Waters, Land, and Ward, surgeons; and Messrs. Winsor, Bastin, and Sheppard, tradesmen in the town.

Before assembling, a copy of resolutions relating to the objects of the inquiry, and adopted at a large and general meeting of the inhabitants on the 29th of January preceding, and also a list of offensive drains and nuisances in the town, drawn up by a committee of twenty-four gentlemen named at this meeting, had been presented to me by Sir Henry Browne.

I opened the proceedings by proving the due publication of the notices, and shortly explaining the course I intended to adopt in conducting the inquiry; and I then commenced hearing evidence upon the various subjects to be elucidated. In the afternoon I proceeded, in company with many gentlemen who had been present at the meeting, personally to inspect those quarters of the town which had been represented as being in the worst sanitary condition; and I may here state that I have never yet seen human habitations more utterly devoid of the precautions necessary for the preservation of health and cleanliness—more crowded, dark, close, filthy, and loathsome, than those in the part called South Town, and in one or two of the neighbouring streets.

It was not without some surprise that I found such pestiferous abodes in a town resorted to by invalids for the recovery of health, and in close proximity with the dwellings of the open and airy quarter they inhabit.

I continued the inquiry during the two following days, the 6th and 7th of February, devoting the mornings to the hearing of evidence, and the afternoons to a further inspection of the town or an examination of the surrounding country.

I received the testimony of the following witnesses, viz.:—

1. William Staple Winson, builder.
2. Thomas Manston Eustace, private gentleman.
3. Samuel Blackmore, waywarden of Withycombe.
4. Elizabeth Dyer.
5. William Henry Land, surgeon; Medical Officer of Littleham.
6. William Brutton, master mariner.
7. Thomas Hall.
8. Elizabeth Daniel.
9. Sarah Webster.
10. Henry Branscombe, builder.
11. John Spettigue, surgeon.

12. Dr. Kane.
13. William Henry George.
14. William Sheppard, draper.
15. The Rev. J. W. T. Lee, Incumbent of Withycombe.
16. John Trenchard, solicitor.
17. Alexander Ferres, tailor.
18. Allan Waters, surgeon.

With a view to ascertain the facilities afforded for future works of improvement, and to determine the boundaries which may be most advantageously adopted, I again visited the town on the 1st of August.

From information thus acquired I have prepared the Report which I now beg to submit to your Honourable Board.

GENERAL DESCRIPTION.—The town of Exmouth is situated on the southern shore of the county of Devon, at—as its name imports—the mouth of the Exe; a river which, rising at Exmoor, in Somersetshire, flows past Tiverton and Exeter, and here falls into the sea.

Exmouth is by the road 176 miles, and by railway 202 miles, from London.

The exact situation of the town is on the eastern bank, and at the gorge, of a shallow estuary, about five miles long and from a mile to a mile and a half broad, the bed of which is left dry at low water, excepting where occupied by the winding course of the Exe.

A tongue of flat land projecting opposite the town obstructs the mouth of the estuary, and, partially enclosing a portion of it, forms a natural tidal harbour for vessels of small tonnage; and it is to this advantage, coupled with that of proximity to the open sea, that the origin of the town is probably due.

The rise of tide at the springs is about 12 feet, and at the neaps from 7 to 8 feet; and during both rise and fall, the current—from the large body of water necessarily passing in or out—runs through the narrow gorge of the estuary with considerable velocity.

The geological position of Exmouth is upon the new red-sandstone formation; and a gently-rounded ridge of this rock, abutting upon the sea towards the south-west in a perpendicular cliff of no great altitude, and sloping very gradually towards the north-west, forms, with an alluvial deposit at its base, the immediate site of the town. This ridge rises inland, in a north-easterly direction, and is gradually lost in undulating ground of considerable elevation.

In the interior of the country numerous small springs issue from the hill sides and form streams in the valley lines, two of which, of inconsiderable size, discharge near the town; one,

called the Withycombe Brook, falling into the estuary on the north, and the other, called the Littleham Brook, falling directly into the sea on the east. These streams, however, bring down the surface drainage of an extensive district; and the large boulders with which their beds are strewn attest the force of the currents when swollen by the accumulations of heavy rains.

The views from the town—whether across the estuary and embracing the well-wooded hills on its opposite shore; or along the indented and picturesque coast, open as far as Berry-head on the further side of Torbay—are extremely pleasing.

The town lies completely open to the prevailing winds, which, blowing from the south-west, are—although occasionally extremely violent—invariably mild in temperature; and it is in a great measure screened, by the high land in its rear, from the colder winds of the opposite quarter.

The climate is thus described by Dr. Shapter, in his work “On the Climate of the South of Devon, and its Influence upon Health:”—

“Notwithstanding the south-westerly aspect of Exmouth, it offers a more bracing climate than any of the watering-places here described. It may almost be said to be unsheltered by any intermediate neighbouring ground, though to a certain extent the Woodbury Hills protect it from the north. Exmouth at times suffers severely from the south-westerly gales, which blow immediately into it; but as the winds from this quarter rarely bring a low temperature, no inconvenience is suffered from them, but the violence with which they blow. The north-west is the blighting and obnoxious wind of this place, and not the easterly, as is more usual on the coast. The climate partakes of the same character as that of the district, modified by the sea only. An inhabitant, to whose opinion I would defer, thinks it more equable than any on the coast; and that this may in some measure be owing to its exemption from the damp vapours so often experienced in the valley towns.”

Exmouth is said to be less liable to rain than other towns in the neighbourhood, and more particularly, and in a very marked degree, than the district commencing only a short distance to the north.

Dr. Shapter states, with reference to this—

“Certain it is that clouds from the Atlantic are seen coming, as it were, straight towards it (Exmouth), and then, seemingly attracted by the high lands from Berry-head to Haldon, sweep by before they discharge themselves into the interior of the country.”

I have not been able to procure any returns of the quantities of rain falling at Exmouth; but through the kindness of Mr. Coleridge, of Ottery St. Mary, have been furnished with the following table, showing the depths of the rainfall in the neighbouring town of Sidmouth, from observations by Dr. Cullen during the four years 1844-47:—

Mean Monthly and Annual Depths of the Rain-fall at Sidmouth during the four years 1844-47.

Years.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Quantity.
1844	3.13	3.75	4.51	0.88	0.06	0.53	2.02	2.70	2.20	1.74	0.81	0.73	23.06
1845	2.90	1.14	2.34	1.02	0.61	1.72	0.64	2.43	2.35	1.51	3.00	1.30	21.06
1846	4.30	1.08	2.65	2.29	1.08	0.91	3.71	1.25	1.35	4.17	3.08	1.40	27.27
1847	2.98	1.67	3.06	2.37	2.91	0.98	2.29	2.16	0.39	8.39	3.42	2.27	32.89
Mean .	3.32	1.91	3.14	1.64	1.17	1.04	2.17	2.14	1.58	3.96	2.58	1.42	26.07

It thus appears that January, March, and October are the wettest months; the mean depth of the rainfall in these only exceeding three inches; that the next in order are July, August, and November, during which the mean depth exceeds two inches; and that May, June, and December are the driest.

On reference to a return of the rainfall at Cardiff, a town in nearly the same latitude as Sidmouth, and not 60 miles north of it, I find that the average depth during the 20 years 1824-43 is 46.21 inches, or almost double the depth above given. There would seem therefore to be some truth in the commonly received opinion of the comparative freedom from rain of this part of the southern coast, as compared with the district lying immediately north.

Exmouth—which was originally only a small fishing-hamlet—has been for a long period a well-frequented watering-place. Its proximity to Exeter, and the beauty of its situation, at first rendered it a favourite place of resort for the inhabitants of that city; but of late years its advantages of situation and climate have attracted visitors from all parts, many of whom have since made it their constant place of residence.

The great proportion of the inhabitants are dependent upon the numerous resident families in easy circumstances, and upon the visitors who resort to the town during the summer and autumn seasons; but some support is derived from the large quantities of fish occasionally taken off the town, and forwarded to the inland markets; and many of the women and children of the lower class earn a scanty livelihood in the occupation of lace-making.

The buildings may be said to be of two periods, for there is a marked difference between the older and newer constructions. The old town occupied only the flat in the vicinity of the harbour and a portion of the sloping ground before described, and lay completely under the shelter of the hill. The houses composing it are mostly of a very inferior class; a large proportion of them being built with earthen, or,

as they are here called, "cob" walls, carried up two stories high and covered with roofs of thatch. They are, moreover, for the most part disposed in irregular streets so narrow as barely to permit the passage in them of one vehicle past another. Tower-street, Fore-street, Chapel-lane, South-town, South-street, and King-street, may be instanced as streets answering this description; and most of these have courts leading from them, still more narrow and confined.

In the construction and disposition of these dwellings provision for the free passage of light and air seems to have been altogether overlooked. Some of the streets, however, in the old town, lying towards the harbour, such as the Strand and the Parade, are wide and airy, and contain houses of a superior class.

The newer town occupies the higher land around the older, but principally that portion of it lying towards the east and facing the sea. The houses of this part are chiefly of the second and third class, disposed in terraces or in wide and open streets, but built without much attention to regularity or uniformity of design. The principal terrace faces the sea, and is called the Beacon; and at right angles to it, and at its eastern end, is a main street consisting of detached villa residences.

With the exception of a new church, there are no public buildings in the town of any importance.

It is an unfortunate circumstance for the town that the land suitable for building purposes has been chiefly in the hands of a single proprietor, and one who has not interested himself either in the class or disposition of the houses erected upon his estate; and who has granted building-leases only upon such terms as were not likely to attract builders or speculators of capital.

Mr. John Trenchard states:—

"In the parish of Littleham nearly all the house property is held under the trustees of the late Lord Rolle's estate, upon leases for a term of 99 years, determinable on the death of the survivor of three lives. On new grants a power was formerly given to obtain a new term of 99 years upon the death of the first of the three lives, to be determinable on the death of one other life upon a small fixed fine; but this privilege has been abolished, and now in every case the fine is arbitrary. I consider that this description of tenure has a great influence upon the state of the houses in South-town, the lessees not having the interest they ought to possess in giving the proper conveniences to the tenants."

STATISTICS.—*Boundary and Area.*—The town is situate in two parishes, viz. the parish of Littleham and the parish of Withycombe Rawleigh; but the larger portion of the buildings are contained in the former parish, as will be seen by reference to

the accompanying plan. The authorities are in possession of no other plan of the town than that contained separately in the surveys made for the commutation of the tithes of the respective parishes, and the two parts of which are plotted to different scales. The area of the parish of Littleham is 2260 acres, and that of the parish of Withycombe Rawleigh is 1882 acres.

Population.—The Census returns of the population of the two parishes in the years 1831 and 1841 are as follows:—

	Population.	
	1831.	1841.
Parish of Littleham	3189	3927
Parish of Withycombe Rawleigh . . .	1063	1192
Total	4252	5119

Showing an increase in the ten years of 867: being at the average rate of 1·84 per cent. per annum.

Mr. Land, the Registrar for the District, estimates the present population of the parishes as follows:—

	Present Population.
Parish of Littleham	4152
Parish of Withycombe Rawleigh . . .	1247
Total	5399

Showing an increase in eight years of 280: being at the average rate of only 0·67 per cent. per annum.

In 1841 there were 763 individuals resident in the country portion of the district,—the greater number in the parish of Withycombe Rawleigh; and upon this proportion the present population of the town district may be taken in round numbers at 4600.

Houses.—Mr. Trenchard has furnished me with the following tabular statement of the number and annual rateable value of the houses in the town:—

Annual Rateable Value.	Occupied Houses.		
	Littleham.	Withycombe Rawleigh.	Total.
Under . . £5 .	421	99	520
£5 and under 10 .	169	63	232
10 " " 20 .	92	39	131
20 " " 30 .	36	11	47
30 " " 40 .	42	1	43
40 " " 50 .	21	1	22
50 " " 60 .	10	1	11
60 " " 70 .	2	..	2
70 " " 80 .	4	..	4
80 " " 90 .	2	..	2
90 " " 100 .	..	..	..
100 " " 110 .	1	..	1
110 " " 120 .	1	..	1
Total . . .	801	215	1016
Unoccupied houses .	31	13	44
Total . . .	832	228	1060

It thus appears, that out of a total of 1016 occupied houses in the town, 520, or more than one half, are rated at a less annual value than 5*l.*; that 752, or more than three-fourths, are rated at a less annual value than 10*l.*; and that 883, or nearly seven-eighths, are rated at a less annual value than 20*l.*

The rateable value, however, is in the proportion of two-thirds only of the real value; its gross amount being 10,705*l.*, and that of the gross estimated rental being 15,893*l.*

The average annual rental of the houses is 15*l.* nearly.

GOVERNMENT.—Exmouth is not a borough or corporate town; nor is there any local Act of Parliament in force within it having relation to the purposes of the Public Health Act, 1848. A portion of the town, however, has availed itself of the powers contained in the General Act, 3 & 4 Wm. IV., cap. 90, for the purposes of lighting and watching; but with this exception, this town, which contains nearly 5000 inhabitants, is, for all matters of municipal government, precisely in the condition of any village or rural district.

The want of a general governing body, invested with full powers for the proper management of the public affairs, is much felt. Mr. Trenchard states:—

“I am a Guardian of the poor for the parish of Littleham, and have for twenty years past been intimately connected with the parish affairs, and taken an active part in their management; and I can safely say, that I consider that a governing local body is very essential to the welfare of the place; and that the application of the provisions of the statute known as the Public Health Act, 1848, would materially

improve the sanitary condition of the town, and the ultimate prosperity of every inhabitant."

A state of things has resulted from the want of these powers which has created a reputation for the town calculated to injure its prosperity. Mr. W. J. Winsor states:—

"The town has been much talked of lately, as being badly drained; and I think visitors may have been deterred from resorting to it on account of the reputed state of the drainage. The town is mainly supported by the visitors.

"A competent governing body is much wanted."

Mr. T. M. Eustace states:—

"The site is naturally a healthy one; but at present the town is the dirtiest place in the whole county, and I consider its state such as to call for the interference of the Board of Health.

"If the town were better drained, visitors would no doubt flock here in greater numbers."

Mr. J. Spettigue states:—

"I am informed that the town has been much spoken of in the county on account of the defective state of the drainage. This would affect the influx of visitors, and the town would suffer in consequence. I think there is a great want of a competent authority to manage the public affairs."

THE MORTALITY.—The following table, which has been prepared from returns furnished by the Deputy Superintendent Registrar of St. Thomas's Union, exhibits the births and deaths occurring in the parishes of Littleham and Withycombe Rawleigh respectively, during the seven years 1842-8:—

Years.	Total Births.		Total Deaths.		Deaths under 5 Years.		Deaths from Epidemic, Endemic, and Contagious Diseases.	
	Littleham.	Withycombe.	Littleham.	Withycombe.	Littleham.	Withycombe.	Littleham.	Withycombe.
1842 .	98	25	95	20	43	10	31	10
1843 .	132	26	70	20	21	4	8	2
1844 .	124	34	77	33	36	11	21	7
1845 .	132	33	75	21	22	5	5	3
1846 .	121	34	75	17	28	7	15	3
1847 .	116	34	73	15	25	5	6	..
1848 .	113	45	84	35	47	20	35	16
Total .	836	231	549	161	222	62	121	41
	1067		710		284		162	

Taking the population of the united parishes according to the census of 1841, with the addition of the estimated increase (140)

to the middle year (1845), or at $(5119 + 140 =) 5259$; the average annual proportion of deaths to 1000 persons living during the above period will be $19\frac{1}{2}$; and the average annual proportionate numbers of births and deaths to the whole population during the same period will be as follows:—

	Births.	Deaths.	Deaths under 5 Years.	Deaths from Epidemic, Endemic, and Contagious Diseases.
Exmouth — including the two parishes of Littleham and Withycombe Rawleigh . . }	1 in 34	1 in 52	1 in 131	1 in 229

On reference to the table published by the Health of Towns Association, showing the rates of mortality in eleven of the registration districts in the county of Devon during the year 1841, which there is no ground for regarding as more than an average year, it appears that in only three of these districts, viz. Exeter, Plymouth and Stoke Damerel, and East Stonehouse, does the rate of mortality exceed, while in the majority of the remaining eight districts it is considerably beneath, the proportion given in the above table. It further appears that in only one of these districts, viz. Exeter, does the proportion of deaths from epidemics exceed the proportion above given as occurring in Exmouth.

In order that a comparison may be instituted between the rates of mortality in Exmouth and in the more healthy districts, I have in the following table placed the numbers representing the proportions occurring in three of these, viz. Tavistock and Okehampton, Axminster and Honiton, Bideford and Holsworthy, in juxtaposition with those of Exmouth.

	Births.	Deaths.	Deaths under 5 Years.	Deaths from Epidemic, Endemic, and Contagious Diseases.
Exmouth — including the two parishes of Littleham and Withycombe Rawleigh . . }	1 in 34	1 in 52	1 in 131	1 in 229
Tavistock and Okehampton . .	1 in 33	1 in 67	1 in 202	1 in 523
Axminster and Honiton . . .	1 in 36	1 in 66	1 in 244	1 in 556
Bideford and Holsworthy . .	1 in 35	1 in 65	1 in 249	1 in 456

It appears from a return furnished by the Registrar-General that the mortality in Exmouth during the seven years 1838-44 was slightly greater than the proportion above given, being 20 annually to 1000 persons living.

I now proceed to describe the state of the town as regards—

1. The water supply ;
2. The sewerage, drainage, and scavenging .
3. The paving ;
4. The lighting and watching ;
5. The burial-grounds :

And I shall then give some extracts of evidence illustrative of its general sanitary condition.

THE WATER SUPPLY.—The present supply of water is derived either from wells sunk in the substratum of sandstone rock on which the town stands, or from springs issuing at the surface of the ground. I caused samples of the water derived from both sources to be forwarded to Dr. Lyon Playfair for analysis as to their hardness, and the results are exhibited in the following table :—

No.	DESIGNATION.	Degrees of Hardness.
1	Sample taken from Moss's Pump in the Strand.	55
2	„ „ the Well, South Town	28.32
3	„ „ the Beacon Hotel Well	24.76
4	„ „ the Marine Hotel Well	23
5	„ „ the Company's Reservoir	16

It thus appears that the well water is of an extremely hard quality, and indeed of such a hardness as must occasion in its use for domestic purposes a heavy money loss to the town. In all solutions or decoctions of articles of ordinary household consumption, in a water of such extreme hardness, this loss must take place ; and there can be no doubt, that even in the articles of soap and tea alone, the annual amount of loss must be very considerable.

With regard to the extent of the supply of water from wells Mr. Trenchard states :—

“ The whole of the houses in the upper part of the town are supplied from wells, some of them 70 feet deep. The wells are never dry, and the water is very good.”

Dr. Kane however states :—

“ I do not think the present supply of water in the upper part of the town sufficient.”

Mr. W. J. Winsor, who resides in Clarence-road, states :—

“ I have a pump to my house, and an abundant supply of water. The well is 17 feet deep through the sandstone rock ; the well may be pumped dry, but would be full again in about an hour. Before the ground was built upon, people were in the habit of sending for the water from other parts of the town.”

In the lower part of the town, where a stratum of sand overlies the sandstone rock, the wells are necessarily sunk through it

before the water is reached; and as this stratum is permeable, and in part below the level of the tide, they are liable to be rendered brackish by the salt water, and also to be affected by the inundations of the sea.

Mr. W. Shepherd states:—

“In the lower level of the town there is a stratum of sand from 12 to 14 feet deep, below which is the new red-sandstone rock. I have never gone deeper into the sandstone rock than 6 feet, and at that depth there is abundance of water, but it is not good.”

Mr. Bastin states:—

“There are many wells in the lower parts of the town, the water of which is not used, being unfit for drinking. Many wells were affected by the inundation of the sea in 1824, when Mr. Hall’s embankment gave way, and the lower parts of the town were covered with water. Many of the wells were then filled with salt water, and the springs of some have never recovered. The water at high tides is more brackish than at other times. A well 9 feet deep has been sunk in the fish-market within the last ten years; this water is brackish, and quite unfit for drinking. Most of the people living in the lower part of the town are obliged to have their drinking water fetched from a distance.”

Mrs. Elizabeth Dyer speaks to the bad quality of the well-water near the sea, and to the inconvenient distances to which people are in the habit of sending for the better water; and states:—

“We have a pump in our yard, but we cannot drink the water from it, which is brackish. Our tea-water we fetch in a pitcher. My children fetch it, or I should have to pay some one for the labour. The fifteen persons who live at the back of us, in two houses let out into tenements, have no pump whatever. Sometimes they come into our yard for water, and indeed we can hardly keep them out; at other times they go to the public pump about 100 yards off; but the pump-water is not tea-water, for that they must go a great distance. We are badly off for tea-water. The drain I spoke of is frequently stopped for want of water.”

There are several public pumps, the water of which is more or less good according to their situation; but these are frequently out of repair; at times so for weeks and months together. It is a common practice for persons living in the lower part of the town to pay for having drinking water brought to them, and the ordinary weekly payment for this labour amounts to a considerable annual sum.

Mr. J. Trenchard states:—

“Great numbers of persons in the lower parts of the town are in the habit of paying old men and boys 1s. a-week for the labour of fetching drinking-water from public and private pumps.”

The springs alluded to are situated in the lower part of the town, and by means of a reservoir built round them the

water they yield is collected for distribution, on the intermittent principle, through a system of pipes laid under the public streets.

This water, as will have been observed, is less hard than the well-water, but is still of considerable hardness.

On account of the low level of the head of water, the distribution is necessarily limited to a section of the town only; and even here, from the insufficient produce of the springs, the water, at the ordinary rate of charge and supply, is intended to be used chiefly for drinking and cooking; so that a separate supply is necessary for slop purposes. The charge to consumers is "1s. in the *l.* on the rateable value of their premises according to the poor-rates of the different parishes:" the size of the cistern, which is periodically filled, being fixed according to the following scale:—

For	3s. a-year	a cistern containing	10 gallons.
„	10s.	„	18 „
„	20s.	„	35 „
„	30s.	„	50 „
„	40s.	„	65 „
„	50s.	„	80 „

With respect to these works, Mr. J. Trenchard states:—

"They have been completed about six months; there are at present 21 houses supplied; in addition to which—a wherry having been placed near the quay for the supply of shipping—seven or eight ships have been supplied, at the rate of 6*d.* per hogshead.

"In the houses this water is used only for drinking purposes, for brewing, and for washing. The water is of superior quality, but no analysis has been made of it by the proprietors.

"The cisterns, pipes, and laying on to the houses, cost on the average about 50*s.* We take our pipes up to the doors of the houses only; but the proprietors have lately agreed to carry the pipes into the houses upon an annual payment. The principal main is four inches in diameter."

Mr. Trenchard further, on the part of the proprietors, put in the statement respecting these works which is given as an Appendix to this Report.

Mr. Trenchard subsequently stated:—

"I am sole proprietor of the water-works. The total amount of capital expended on the works is 1500*l.*"

It may be observed that these works appear to have been undertaken with very limited views of the requirements of the town in respect to a supply of water; and that the rate of charge for the partial supply they afford can only be regarded as excessive.

THE SEWERAGE, DRAINAGE, AND SCAVENGING.—The mode of drainage adopted consists partly of sewers discharging into

the sea, and partly of cesspools sunk in the substratum. Mr. Trenchard states:—

“ All the houses in the upper and better part of the town drain into sewers, which have been chiefly put in by the ground-landlord; the proprietors of the houses carrying their own drains into them. Most of these drains are trapped with an iron trap. The house-drains are for the most part about one foot in diameter; stoppages are not unfrequently in them, and they smell badly at times. The house-water passes down these channels. All the better class of houses have water-closets.”

With respect to the public drains Mr. Shepherd states:—

“ The largest main-drain is a barrel-drain 2 feet in diameter at the lower end, and at the upper end from 16 to 18 inches in diameter. The old drains of the town are generally of square form, and from 12 to 14 inches on the sides. They are constructed generally of pebbles at the bottom, stone or brick at the sides, and they are covered with limestone flags.”

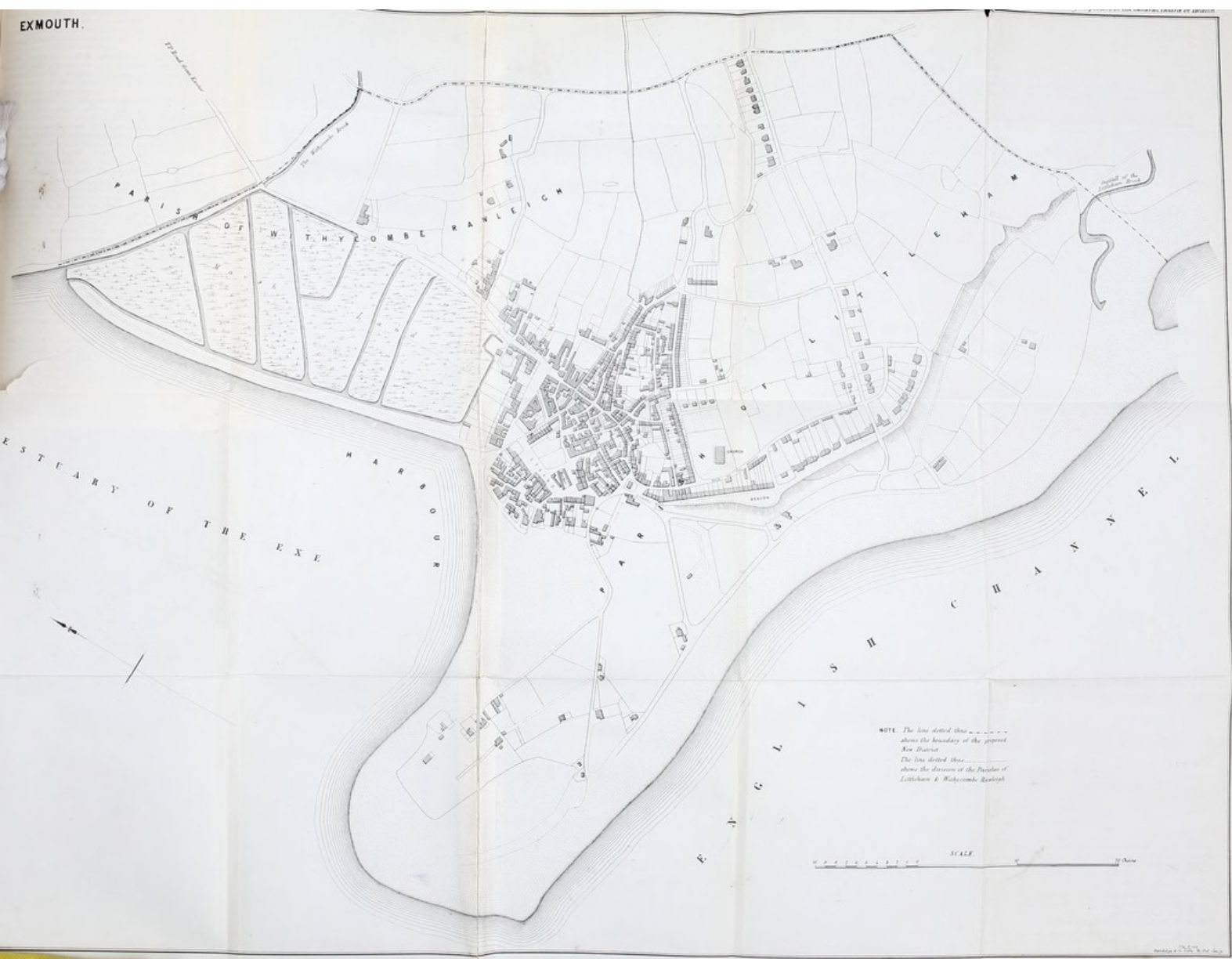
The principal sewer on the eastern and better side of the town is carried out to low water-mark, but the greater number of the sewers and drains discharge into the sea within the harbour, and their mouths are exposed, excepting when the tide is up.

William Brutton states:—

“ I reside near the quay; near me, about 60 yards distant, is one of the main drains conducting the sewage of a large part of the town to the sea. At spring-tides the mouth of this drain is covered by the sea for three or four hours, but at the dead of the neap-tides it is not covered at all. I find the smell from this drain so bad in the summer time, that I am frequently obliged to send my family away from the annoyance to the beach for fresh air. I have frequently seen persons passing along the quay cover their faces with their handkerchiefs from the badness of the stench. The prevailing wind, which is westerly, carries the effluvium towards the town. There are four other main drains discharging along the coast, besides eight smaller ones; and the mouths of all these are exposed quite as much as the mouth of that opposite my house. At neap-tides a good deal of the matter of the drains is exposed, having been deposited from the shallow water upon the beach in the harbour, and when the sun lies hot upon it, and particularly with the wind from the westward, this causes a general bad smell along the whole line of quay. I have heard frequent complaints of the smell, both from inhabitants and visitors, and I think it prejudicial to the town.”

One of the main sewers discharges into an open ditch at the back of the parade. This ditch is the southern boundary of an area of marsh land about 50 acres in extent, which was reclaimed from the estuary about 40 years since, by the then Lord of the Manor, a sea-wall or bank having been formed for the purpose. The surface of this land is about 6 feet below the level of high water-mark. The proprietor, Mr. W.

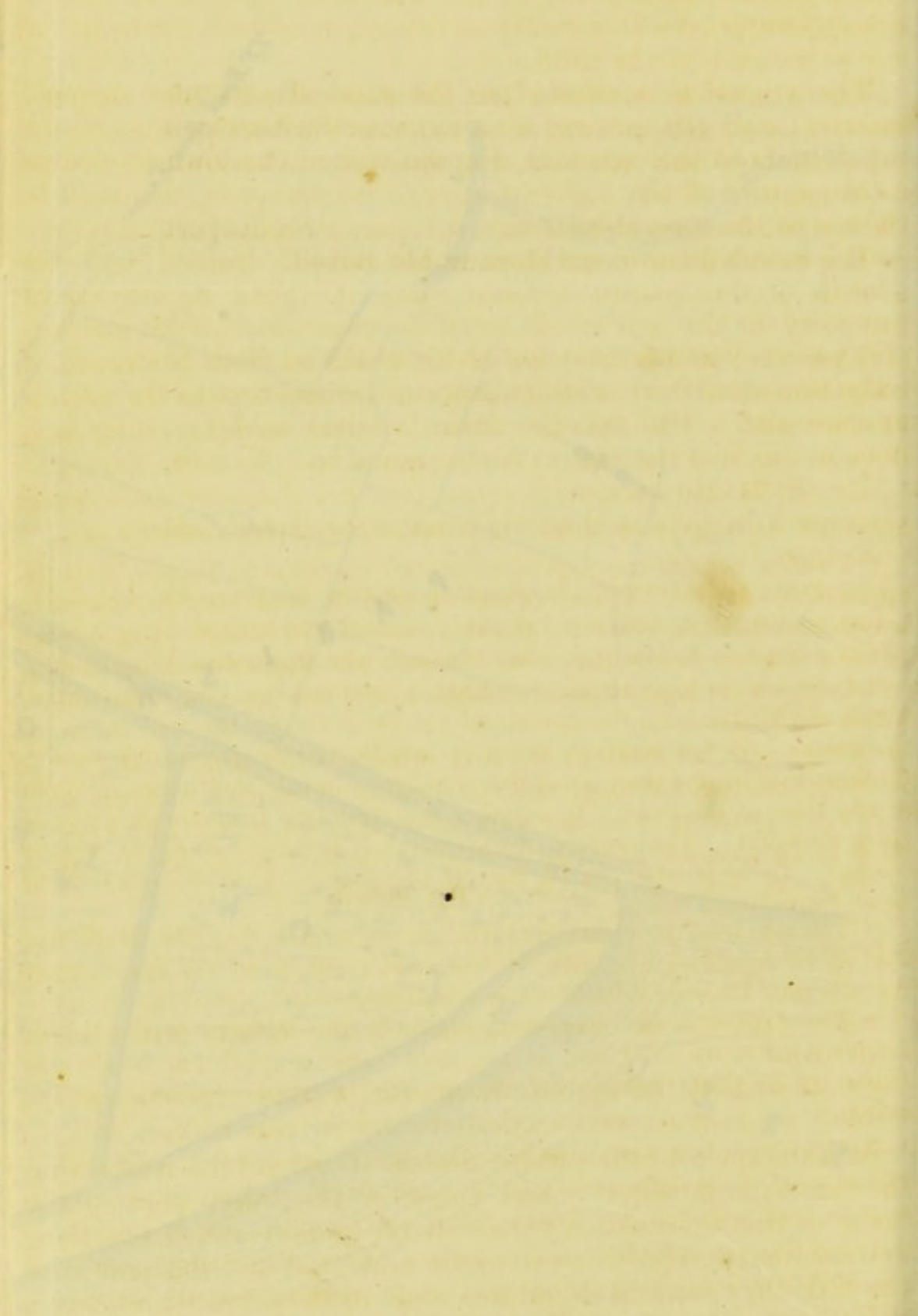
EXMOUTH.



NOTE. The line dotted thus - - - - -
shows the boundary of the proposed
New District.
The line dotted thus - - - - -
shows the divisions of the Parishes of
Littleham & Wilkenson & Littleham.

SCALE
0 1 2 3 4 5 6 7 8 9 10
100 Yards

EXMOUTH



T. Hull, has caused channels to be cut across and around the fields into which it is divided, for the purpose of diverting the contents of the ditch, to effect with them a sewage irrigation of the meadows; and he has also caused a basin to be formed, in which deposit takes place of the matter in suspension in the sewage-water, the accumulation being periodically cast out for use as manure in the solid form.

The irrigation is effected in the coarsest and most slovenly manner; and the process is an extremely offensive one to the inhabitants of the neighbouring houses. I am uninformed as to the nature of the right (if any) of the owner of this land to the use of the sewage-water.

The marsh land in question is not subsoil drained, and the growth of the coarser grasses upon it shows an excess of humidity in the soil which must be repressive of its productive powers; and indeed the result obtained from the mode of irrigation described is insignificant in proportion to the means at command. The average annual rental, as I am informed, does not exceed the rate of 3*l.* 5*s.* per acre.

Mr. T. M. Eustace, with respect to the nuisance and inconvenience arising from the irrigation of this marsh, states:—

“ I reside outside the turnpike-gate on the road to Exeter, exactly opposite the marsh. There are some ditches in it of very considerable length and breadth, receiving the drainage of 170 houses. I saw some of these ditches before they were cleaned out about two months ago, and there was at least 18 inches of black mud in them below the water, which must have been the deposit of the fecal matter brought down by the drains. In hot weather there is usually hardly any water in the ditches, and in one part particularly there is hardly any water in them at any time of the year. In summer the effluvium from them is something dreadful. The surface of the marsh is usually wet in the winter season. There is occasionally fog on the marsh, and the smell is at those times much worse.

“ The tide used to come into the marsh-ditches, but Mr. Hull had the valve repaired, and now it does not come in so rapidly, so that there is now little or no salt-water admitted.

“ The want of some competent public authority here is much felt. I have tried to do all I can at my own expense; but am constantly frustrated by those having an interest in the mud remaining in the marsh.”

With respect to the public sewers it should be stated that the tide at high water enters those in the lower part of the town, so that their action then entirely ceases; and that during extraordinary tides the sea-water admitted and charged with the filth they contain inundates some of the streets and enters the houses.

Mr. Bastin states:—

“ During the ordinary spring-tides, perhaps four or five tides at each spring the sea-water rises in some of the lower parts of the town to

the level of the streets. There is an open water-course in the strand close to the Market, which is filled at these times. At the corner of Wanhill's-row the salt-water rises, and this is the case all over the lowest part of the town. It sometimes washes the filth of the drains into the houses."

Mr. T. Hall alludes to another inconvenience occasionally happening, and due to the defective construction of the sewers. He states:—

"I reside in Meadow-street, near the north end of the town, and a barrel-drain from 9 to 12 inches in diameter passes down the street in which I live, to the marshes where it discharges. The drainage of my house passes into it, and it has previously received the drainage of a large number of other houses. This drain also receives a large quantity of surface-water, which at times coming with considerable velocity, carries with it gravel and broken stones down to the bottom of meadow H. below my house, where it joins at right angles another drain running along the turnpike-road. Three weeks ago the drain at the junction was stopped by the gravel and broken stones carried down, and the water being then unable to flow off, mounted up in the drain and burst it at a point about 150 feet below me. The drain before bursting became filled for some distance above me, and through my own house-drain overflowed my yard and house from 9 inches to a foot in depth. The foul water remained in my house from ten at night till half-past two. I applied to the surveyor of the highways to remedy the nuisance, but he afforded me no assistance at the time. I consider the street-sewer to be very defective, and that I am still liable to inundation, as are also any of my neighbours."

Mr. Land states with respect to the public drains:—

"Some of the gutters are partly open, partly covered—this renders them worse than they otherwise would be. I consider these gutters a great nuisance."

The condition of many of the house-drains is described in the evidence of Mrs. Elizabeth Dyer, who states:—

"I reside near the quay. A gutter runs through our house, which before it reaches us receives all sorts of abominations from 15 persons. It is open before it reaches us, but underneath our house it is covered with large flat stones. It discharges through the quay-wall immediately on the sand.

"The smell comes up through the floor-boards, and is extremely offensive in the room where we take our meals. Outside the smell is also very bad, in hot weather particularly. I have four children; last summer my little boy was laid up with fever. All the children are delicate, and frequently complain of sickness. I suffer much myself from headache. Twice we have been obliged to take the boards up to clean out the drain. Last week it was choked, and I cleaned it out myself with great difficulty. All the persons behind complain of the smells. There is no one in the town to apply to to remedy the matter. I should be very glad if there were."

It appears that there is no organized system of scavenging

in the town, and not even a public yard for the reception of the dry and solid refuse. The modes of disposing of this kind of refuse will be best described in the following extracts of the evidence.

Mr. W. J. Winsor states:—

“ I have an ash-bin into which I put the solid refuse of my house, and which is usually emptied once a fortnight. I have a horse and cart of my own, otherwise it would cost me 6*d.* a week to remove it. In some of the houses the refuse accumulates into large heaps, being kept for the purpose of sale: 5*s.* a load is usually paid for it. The heaps are mostly very offensive, and particularly so at the times of removal. There are private yards in which this description of refuse is accumulated.”

Mr. T. M. Eustace states:—

“ About a gunshot beyond my house, on the side of the turnpike-road, is a dung-yard, inclosed by a hedge fence and having a gate entrance. Ashes, road-scrapings, kitchen-refuse, the dung of animals, and occasionally carrion are deposited in it. I have heard many complain of the dreadful smell there.”

Mr. W. H. Land states:—

“ There are cesspits to many of the houses, into which both the fecal matters and all the solid refuse are thrown. Many of the privies communicate with these cesspits. They are nearly always emptied during the day, the matter being first shovelled into the street, where it lies sometimes for three or four hours, until the farmer's men take it away.”

Much of the solid refuse is disposed of by being thrown into the harbour.

Mr. W. Brutton states:—

“ Not only do the drains before described cause a nuisance along the quay, but privy-soil, the contents of the cesspits, offal, and all manner of rubbish are frequently brought and discharged over the quay-wall, where at neap-tides it remains until the spring-tides rise high enough to wash it away. I suppose the poorer classes are driven to dispose of their filth in this manner from the want of proper accommodation in their own houses. In summer the tide does not cover the flat for some distance out from the quay, and for about a third of the year it does not touch the quay-wall.”

There is a great deficiency of privy accommodation in the town; the extent of which in one district will be shown in a subsequent part of this Report. Mr. W. J. Winsor's evidence upon this subject, however, may be given here. He states:—

“ In the poorer parts of the town the houses have no necessities. The fecal matter produced in these houses is either thrown on the surface of the public streets or in some nook or corner near, or on to the grating of the public sewers. The inmates have no other means of disposing of this description of refuse—the slops and the contents of the chamber-vessels are similarly disposed of. These streets are most offensive in the summer time.”

Many of the cesspits are used as common necessities.

Mr. T. Hall states :—

“There is a cesspit opposite my house, the door of which is nearly always open. It is made use of as a common necessary, and is a great nuisance to the whole street.”

The following is descriptive of the condition of some of the street-gutters in the lower part of the town.

Sarah Webster states :—

“An open gutter runs before our door, which receives the whole of the filth of every description produced in the houses along its course.”

There are several offensive slaughter-houses in the town.

Mrs. Sarah Webster describes one of these, situated in Back-lane. She states :—

“I live near the slaughter-house and pigsty of Mr. Webber. The gutter from the yard and slaughter-house runs into the street. There is a dung-yard opposite. The pigs are fed upon the offal of the beasts killed. The yard smells very bad; and when they carry the offal into the yard the smell is most shocking.”

PAVING.—The state of the pavements and of the street surface generally in the lower parts of the town is very defective.

Some of the streets are not repaired by the Surveyors of Highways, but by the inhabitants of the houses in them.

Mr. W. S. Winsor, who resides in Clarence-road, in the new part of the town, states :—

“There is a macadamized road in front of my house and a footpath unpaved; I made the road myself, and I maintain it myself as far as my own house goes. The other houses in the street pay their share for the maintenance of the road. I believe the Surveyor of Highways has been applied to to repair the road, and has refused. I also pay for my house to the general highway rates. Some have thought it rather hard that the parish does not repair this road.”

LIGHTING AND WATCHING.—The town is partially lighted with gas by a joint-stock company, not incorporated under a local Act, but registered according to the provisions of the general Act, the 3rd and 4th of William IV. c. 90.

Mr. W. H. George states :—

“The gas company was registered in 1842, and the total capital expended by it to the present time is 2300*l*. The annual consumption of coal in the works is from 130 to 140 tons, costing from 19*s*. to 20*s*. per ton. The principal main is 4 inches in diameter. The quality of the gas is said to be very good; I burn it in every room in my own house. The present charge to private consumers is 10*s*. per 1000 cubic feet; it was formerly 12*s*. 6*d*. per 1000 feet, but the reduction was made about three years since. The public lamps are charged for

at the rate of 3*l.* 3*s.* per annum; and they are lit—excepting on the three nights preceding and two following the full moon—from the 1st of September to the 1st of May. The more fashionable parts of the town only are lighted, the interior of the town being left in darkness. The line of street lighted includes the Parade, the Strand, the Beacon-Hill, Louisa Terrace, Trefusus Terrace, Bicton Place, and Bicton Terrace; and rather more than one-third of the town only can be considered as properly lighted. All the shops are lighted with gas, and a few private houses.

“There is no public oil-lighting in the town. The concern pays about 5 per cent. on the capital expended.”

It appears, also, that the town is but partially watched. Mr. J. Trenchard states:—

“Under the provisions of the same statute, 3rd & 4th of William IV. cap. 90, a rate is made for the maintenance of one policeman for the parish of Littleham: 880 assessments, including the whole of the town in Littleham parish, and producing about 70*l.* a-year, pay for his support and the expenses.”

That part situate in the parish of Withycombe Rawleigh is quite unwatched.

BURIAL-GROUNDS.—The town has the use of as many as five burial-grounds; of which one is situated in Littleham parish, and the remainder in the parish of Withycombe Rawleigh. They are nearly all however placed at inconvenient distances.

With respect to the ground in Littleham parish, Mr. S. Blackmore states:—

“The burial-ground is two miles from the centre of the town. It was formerly about three-fourths of an acre in extent, but was enlarged three or four years ago, and is now about an acre. Before the enlargement it was very much crowded with graves; there is now plenty of room for five or six years to come. The graves are usually sunk about six feet deep, and, as the soil is wet and undrained, in most of them in the winter time there is usually three feet of water.”

The Rev. W. T. Lee furnished me with the particulars of the burial-grounds in Withycombe Rawleigh parish. He states:—

“The burial-ground of Withycombe parish is attached to the old church, and is about three miles from the town. The extent of this ground is about two acres; and the area is by no means crowded, there being room for interments in it for several years to come. The graves are usually dug from five to six feet deep. I have frequently seen water in them; I have seen it an inch and a half deep.

“There is another ground, about one mile from the town, and attached to the parish chapel: this is only about one-third of an acre in extent, and is also far from crowded. The fees in this ground are much heavier than in the former, and in consequence very few interments take place in it.

“There are two other burial-grounds in this parish. One attached to Glenorchy Chapel, belonging to the Independents, on the

outskirts of the town, about one-sixth of an acre in extent, and not more than half-filled with graves; and the other belonging to the Plymouth Brethren, but detached, and about one mile distant from the town; this latter is nearly a new ground, and about a quarter of an acre in extent."

SANITARY CONDITION.—A stranger visiting Exmouth, and staying in the better and more frequented parts of the town—which are, to all appearance, clean and well kept,—and, it is to be presumed, the greater number of the inhabitants themselves resident in these parts—would hardly believe that in close proximity to their dwellings are quarters in the condition about to be described.

Mr. Henry Branscombe states:—

"I have examined that part of [the town called South-town, South-street, and King-street, with the courts leading out of them.

"In South-town there are 27 houses, of from two to three rooms each, containing 99 inhabitants; 43 of whom have no privy whatever to use; while 46 have no water, except what they fetch from a public pump from 30 to 120 yards distant. Those individuals, having no conveniences, are in the habit of getting rid of the whole of their fecal refuse by throwing it in the gutters, or on the gratings of the open street in front of their houses.

"In South-street there are 168 inhabitants, living in 41 houses (mostly two-roomed). Of these individuals 144 are without privy accommodation, and 162 are without water, except what they fetch from the public pump, from 40 to 120 yards distant. The refuse of the 144 individuals without privies is mostly deposited in six cesspits, which are emptied about once in six weeks. Not only the night-soil, ashes, and other refuse are deposited in these cesspits, but all sorts of offal, and particularly—and in very large quantities—the offal of fish in the fishing season; many of the inmates of the houses being fishermen, who cleanse and gut their fish at home. This breeds maggots and all sorts of insects, and the smell it occasions is most dreadful. Under one of these cesspits is a drain leading into the main sewer in South-street, which, before it reaches this point, is open for 20 yards; and along this the drainage of about 30 houses and the sullage of 3 or 4 pigsties are conveyed. One of the houses in this street is a vagrant lodging-house; it has no back-door, is without either drain or privy, and has no water on the premises.

"In King-street there are 64 inhabitants, living in 14 houses, of either two or three rooms each; 59 of these individuals have no privy to use; the whole 64 fetch their water from the public pump, from 6 to 60 yards distant. One family of 9 members lives in a house in this street, without any privy, and without water on the premises. There are no cesspits in this street, but the refuse produced in the houses on one side is heaped up in a little garden at the back; and on the other side, the 30 inhabitants deposit their refuse in heaps by the side of the pigsties at the back, where it lies until removed into the farmers' carts. The removal always takes place in the day.

"Out of South-street there are two courts, with no outlet through

them; each having an open cesspit, receiving the whole of the refuse of the houses in it."

The same witness adds:—

"There are many other streets and courts in that part of the town bordering on South-town, in every respect as badly off for accommodation as those above described."

The evidence of Elizabeth Daniel, an inhabitant of South-street, may throw light upon the scanty means of livelihood possessed by many of the lower classes in this town. She states:—

"I live at the bottom of the street, in a house containing two rooms, one over the other. There is no backlet to the house, and no necessary; not a single house in the street, as far as my knowledge goes, has got a privy.

"I am a lacemaker, and obtain my livelihood from that occupation alone. Not being a good hand at lace-making, I cannot earn more than 2*d.* a day at it. I pay when I am able 1*s.* a week for my house. The cesspit at the side of my house is usually emptied once a month, and the farmer who takes it away (generally in the morning) gives us sometimes 6*d.*, sometimes 9*d.* for the stuff. There is one cesspit to four houses. I used to have relief from the parish, 1*s.* a week and a loaf, but I have not had this for 42 or 43 weeks past. I am not well in health."

The over-crowded and filthy state of the vagrant lodging-houses is described by Mr. Trenchard, who states:—

"In the vagrant lodging-house in South-town, spoken of by a former witness, and kept by Bartlett and wife, there are frequently 15 vagrants at the same time during the night, and the average nightly number is from 8 to 10. The house contains 6 rooms, each about 10 feet square and 6 feet high; two rooms below and two above are used by the vagrants, and two are kept by the woman of the house for her own accommodation. The house has no backdoor, no necessary, and no supply of water on the premises, or nearer than 70 yards. There are four beds in this house, and the vagrants usually pay 3*d.* per night each.

"There is another house of the same description in Chapel-street, kept by a man named Harris. This house has no necessary, but there is a dung-heap in the yard by the side of a pigsty. This house contains two rooms above and one below, and there are always a greater number of vagrants in it than at Bartlett's—the average being 10. Here the vagrants pay 3*d.* per night for lodging, or 6*d.* is given for a bed, and in this case four frequently sleep in it. There are four and a half beds; the half-bed being a very small one.

"There is also another house of this description in Boyce's court, near Fore-street, kept by Mrs. Boyce. This house contains five rooms, two below and three above, and they take on the average seven lodgers nightly.

"This house is frequented by a better class of vagrants than the others, 4*d.* being paid for the night's lodging. There are five beds in it."

The evidence of Mr. W. H. Land, the medical officer of Littleham parish, shows the connexion between filth and disease. He states :—

“ The worst street in the town for cases of fever is South-street ; the houses in which are small miserable tenements, inhabited by the poorer classes, mostly paupers. The inmates of these houses are attacked frequently with a disordered state of the stomach and bowels, and sometimes with fever. I cannot say that I find much fever in the houses there ; but the inmates are certainly weakly. The cholera was bad in that part of the town in 1833 ; it broke out there. The house in which it first appeared was a vagrant lodging-house. In South-street 12 or 14 persons died in the course of a month or less, and 8 or 10 died in the first week. In the whole town 20 deaths occurred altogether. I think the inhabitants of South-street were attacked more severely, being predisposed from bad living, and also from the bad atmosphere around them.

“ I think the poor suffer much from the bad accommodation provided by the landlords, from want of backlets, and from the accumulation of filth around them, which, under the present system, unavoidably takes place.”

The medical testimony generally illustrates the same fact.

Dr. Kane states :—

“ After the epidemics, such as we have had, of scarlatina, measles, and other suchlike diseases, I have observed cases of lingering remittent fever, especially amongst children, which I should be inclined to attribute in a great measure to the filthiness of the houses and the want of proper supplies of water. I remember one case in particular where a person was positively poisoned by the emptying of a cesspit next door. The cesspit in this case was emptied in the morning—the patient’s window being open ; and she was attacked with faintness, utter prostration of strength, and obstinate vomiting, followed by a train of nervous symptoms, which were found extremely difficult to get rid of.”

Dr. Kane mentions the defective ventilation of the houses as one cause of disease. He states :—

“ The ventilation of many of the houses is very imperfect ; and in the case of houses where lace-schools are kept, and where large numbers of young females are congregated together, I think much ill health is produced from this cause.”

And he adds :—

“ Some of the courts in South-street and other parts of the town have no thoroughfare, and I think the circulation of air through them by no means sufficient.”

Mr. Allan Waters states :—

“ With respect to the ill effect of the accumulations of filth in the town I may observe, that I have found the only fatal cases of scarlatina (which has been the prevailing disease lately) occurring in the more filthy and worse ventilated houses. The only cases of fever which usually occur are from derangement of the stomach and bowels, and catarrhal affections. In the poorer part of the town, and more parti-

cularly in the neighbourhood of South-town, this prevails. I think the state of the drainage there is calculated to promote disease; and should the population increase largely, disease would probably break out."

Mr. J. Spettigue states:—

"I consider the site of the town of Exmouth to be naturally a very healthy one; the air is very mild and well suited for invalids. The drainage of the town is very defective. The marsh ditches in particular are a great nuisance to that part of the town. Supposing the population of the town to increase largely and the drainage not to be improved, I think it probable that a great deal of sickness may result."

RECAPITULATION AND SUMMARY OF CONCLUSIONS.

1. That the town occupies an open and naturally salubrious site at the mouth of the Exe.
2. That, with the exception of an area of marsh land of moderate extent on its north side, the general conformation of the ground constituting the site, and the nature of the substratum, favour the prompt discharge of surface waters.
3. That the houses of the more modern and upper parts are generally of a good class, disposed in wide and airy streets, but that the houses of the lower and older parts are mostly very inferior constructions, placed in narrow irregular streets, and close and ill-ventilated lanes and courts.
4. That it is not a corporate borough, and that there is no local Act of Parliament in force within it having relation to any of the purposes of the Public Health Act.
5. That a portion of the town has availed itself of the provisions of the General Act, the 3rd and 4th of William IV. cap. 90, for the purposes of lighting and watching; but that, with this exception, the town, as regards powers for the management of public affairs, is precisely in the condition of any village or rural district; and that these powers are utterly inadequate for the maintenance of the sanitary condition of the town.
6. That the rate of mortality in the town, in comparison with the rates occurring in other towns in the same county, is high; that epidemic, endemic, and contagious diseases prevail in some parts of it; and that the usual state of health of the inhabitants of one quarter is low.
7. That the town is supplied with water of a hard quality from the substratum.
8. That the water is commonly obtained by means of draw-wells and pumps; that in a large section of the town there are very few private pumps; that the public ones provided are at long and inconvenient distances apart, and are often out of

repair, and that the supply generally by this mode is insufficient.

9. That works have been formed by private individuals in the lower part of the town for the distribution of water to the houses there through a system of pipes on the intermittent principle, but that the supply from these works is very limited, at a high rate of charge, and not generally adopted.

10. That a heavy pecuniary loss now accrues to the town from the hard quality of the water at present in use, and also from the modes by which it is supplied.

11. That the provision for the disposal of the excrementitious refuse consists partly of drains leading to the sea, partly of cess-pools sunk in the substratum, and partly of open cesspits.

12. That many of the drains are nearly filled with deposit, and that their construction generally is very defective.

13. That one of the main drains first discharges into an open and nearly stagnant ditch on the north side of the town, from which the sewage-water is led through open channels for the irrigation of some marsh-meadows before its ultimate discharge; that there are houses immediately bordering upon these meadows, and that the process, from the slovenly manner in which it is conducted, is extremely offensive and injurious to the health of the inhabitants of these houses.

14. That there is a deficiency of privy accommodation, inso-much that the great majority of the inhabitants of one quarter of the town are entirely without it.

15. That there are several offensive slaughter-houses in the town.

16. That there is no public service of scavenging, and no public yard for the reception of dry refuse; and that accumulations of filth abound in the lower part of the town.

17. That the atmosphere of this part is always more or less vitiated by exhalations from animal and vegetable matter in a state of decay; and more especially, and to a most offensive degree, in warm and close weather.

18. That the state of the paving and road surface generally in the lower part of the town is defective.

19. That the vagrant lodging-houses are at times much overcrowded, and that it is desirable that supervision should be exercised over them.

20. That the filthy condition of parts of the town lessens its attractions for visitors, and that the inhabitants sustain a pecuniary loss in consequence.

21. That there are five burial-grounds in the two parishes, three of which are for the use of members of the Established Church, and the remaining two for dissenters; that four of these are placed at an inconvenient distance from the town, but that none of them are much crowded with graves.

22. That it is desirable that a general cemetery be provided in the immediate vicinity of the town for the special use of the inhabitants.

23. That the comfort of the inhabitants generally would be promoted, and their health and condition improved,

a. By an abundant supply of pure water.

b. By an efficient system of refuse and surface drainage.

c. By the drainage of the area of marsh-land on the north side of the town.

d. By better formed and repaired streets and foot-pavements in the lower parts of the town.

e. By the establishment of a well-organized service of public scavenging.

f. By an extension of the lighting.

RECOMMENDATIONS.

I therefore recommend—

I. *Application of Act.*—That the Public Health Act be applied to the town of Exmouth, within the boundaries hereafter to be described.

II. *Boundaries of District.*—That the boundaries of the district to which the said Public Health Act shall be applied be those represented by the dark dotted line on the accompanying plan; commencing on the north at the point where the Withycombe Brook falls into the estuary of the Exe, and proceeding thence in an easterly direction along the artificial course of this brook to the turnpike-road leading from Exmouth to Exeter; thence along the natural course of the brook to the road next beyond, at the point near a certain mill; thence southerly along this road to the point indicated; thence with a slight change of direction, but still southerly, along the road leading to the sea-shore at a point near the lime-kilns, and straight to the sea.

These boundaries include a total extent of about 460 acres of land, of which about 328 acres are in the parish of Littleham, and about 132 acres in the parish of Withycombe Raleigh.

III. *Constitution of Local Board of Health.*—That the Local Board of Health to be elected under the said Public Health Act shall consist of nine persons, and that the entire number shall be elected from the whole of the said district.

That one-third in number of the said Local Board shall go out of office on the 25th day of March, in each year subsequently to that in which the said election takes place.

That every person shall, at the time of his election, be

member of the said Local Board, and so long as he shall continue in office by virtue of such election (being resident, as in the said Public Health Act 1848 is required), be seised or possessed of real or personal estate, or both, to the value or amount of not less than five hundred pounds, or (being so resident) rated to the relief of the poor of the parishes of Littleham or Withycombe Rawleigh upon an annual value of not less than twenty pounds.

IV. *Drainage of Suburban Marsh-Land.*—That Parliament be asked to confer additional powers upon the said Local Board of Health, enabling them to effect the drainage of the entire area of marsh-land lying to the north of the town, and included within the limits of the said district.

I propose now, for the guidance of the future Local Board, to enter into some detail with respect to the two more important branches of the works which should be undertaken by them for the improvement of the sanitary condition of the district, viz:—

1. The works for the supply of water to the town; and
2. The works for the drainage of the town and district.

1. THE WORKS FOR THE SUPPLY OF WATER TO THE TOWN.

It has been shown that a portion of the existing supply of water is obtained by means of draw-wells and pumps, from the substratum of sandstone rock on which the town stands; and the remainder from springs issuing at the surface of the ground in the lower part of the town, the produce of which is distributed to the houses there by means of a system of pipes. It has also been shown that this water is of extremely hard quality, that in quantity it is insufficient, and that the mode of supply generally is very defective.

The quality of the water with which a town is supplied is of much importance to the inhabitants; in an economical point of view it is important, as the consumption of many articles of daily use for domestic purposes, as tea, malt, soap, &c., will be in some measure regulated by its degree of hardness; and on the score of health it is obviously important that the water should be free from impurities. The fact that hard water produces the wasteful results alluded to above is very generally known; but as the mode in which it operates is not so generally understood, it may be well that it should be explained.

To take one of the articles only, viz. soap, the cause of the increased consumption with hard water is thus explained by Dr. Thomas Clark in a late publication:—

“The bi-carbonate of lime dissolved in water destroys a proportional quantity of soap before it is possible to produce in the water a

lather by the rubbing of soap, that is to say, before it is possible to have in the water undestroyed soap available for washing purposes."

It is equally important, for maintaining the sanitary condition of a town, that the supply of water should be in abundant quantity.

In deciding then upon the future source of supply, the quality of the water it yields, and its abundant quantity, will be the two main points for consideration.

In order to ascertain the qualities, as respects hardness, of the various sources to be found in the neighbourhood of Exmouth, I caused samples of the waters they yield to be forwarded, with the other samples mentioned, to Dr. Lyon Playfair for analysis; and the results, in juxtaposition with those of the well and reservoir waters, are exhibited in the following table, where the hardness of each is indicated by the number of degrees. I may mention that each degree indicates as much hardness as would be produced by one grain of chalk per gallon, held in solution in the form of bi-carbonate of lime free from any excess of carbonic acid.

Exmouth.—Analysis of Water.

No.	DESIGNATION.	Degrees of Hardness.
1	Sample taken from Moss's Pump in the Strand	55
2	" " the Well, South-town	28.32
3	" " the Beacon Hotel Well	24.76
4	" " the Marine Hotel Well	23
5	" " the Company's Reservoir	16
6	" " Withycombe Brook	19.50
7	" " Littleham Brook	17
8	" " Sherbrook Lake Spring, near Budleigh } Salterton	2
9	" " Mr. Devett's Fishpond, near Byestock. .	1.40

The above analysis shows a remarkable difference in the degrees of hardness of the various samples taken; and it will be seen from it that the waters of the Withycombe Brook and the Littleham Brook, two sources which on a first view might have been deemed the best for the future supply, are both of more than eight times the hardness of the hardest of the samples Nos. 8 and 9; and further, that the water of the reservoir, which at present supplies a portion of the town, is of exactly eight times the hardness of the hardest of these samples. The choice therefore, so far as the present examination extends, is clearly limited to the two last-mentioned sources, Nos. 8 and 9, if they be in sufficiently abundant quantity.

With reference to quantity, however, I must state that I have no positive information of the flow from either source, but simply an assurance that the volume of each is likely to be found

sufficiently copious for the supply of Exmouth. In the absence of further information I can only recommend that careful measurement should be made of the water supply from both sources during the wet season and during drought; and that if each be found singly sufficient, that should be adopted which with fewest practical difficulties may be conveyed to the town.

The Byestock source is about two miles, and the Sherbrook Lake source about three miles distant from the town, and both appear to be placed sufficiently high for the supply of every house by gravitation alone.

I assume that there will be no difficulty arising from private rights of property in either case, but I am quite uninformed as to the extent of such rights.

The requisite quantity of water for the supply may be estimated upon an allowance of 20 gallons daily to each individual of the population; and taking the number of the inhabitants at 4600, the total annual quantity required will be in round numbers 3,500,000 gallons.

The necessary works will consist of a reservoir for the storage of the water; of a main-pipe for its conveyance to the town; and of a system of secondary pipes for its distribution throughout the streets and houses.

The size of the reservoir will be dependent upon the rate of the minimum flow from the springs, and need only be sufficient to store the quantity required to make up the full supply during times of drought, when the produce of the springs might be unequal to the demand.

In carrying out the works the following points should be attended to, viz.: that the supply should be on the constant principle and in quantity unlimited; that the water should be carried by branch-pipes through every street and into every house in the town, however small; that plugs should be placed at convenient distances apart in the streets, to afford a supply of water for cleansing the surface of the streets and pavements, and for the extinction of fires; that every house should be provided with at least two orifices of discharge, one placed at the most convenient point for the supply of water for culinary and cleansing purposes, and the other in the water-closet or improved privy, and affording a supply for the instantaneous removal of refuse-matter; and that the extension of the system of pipes into the upper rooms of dwellings should be promoted.

I estimate (approximatively only, on account of the imperfect data before me) the cost of these works, viz. the reservoir, the main-pipe, and the system of distributing pipes, so far as they extend under the public streets, with proper fire-plugs, &c. at 3800*l*.

2. THE WORKS FOR THE DRAINAGE OF THE TOWN AND DISTRICT.

These works may be conveniently divided into works of town drainage and works of suburban drainage.

1. *Works of Town Drainage.*—The principal difficulty that attends the drainage of the refuse of the town consists in the fact of a considerable portion of its lower area being but little above the level of high water, and having its outfalls periodically closed by the rising of the tide.

To meet this difficulty, it appears to me that the most economical plan would be to adopt two separate and distinct systems of tubular drains; one extending throughout the upper and larger area, and the other being limited to the lower and smaller area.

The advantage of this plan is, that, while discharge would take place from the upper system during all states of the tide, the drains of the lower system would be proportionably relieved as to the amount of accumulations which must necessarily take place in them during the three or four hours when the outfall is closed.

Notwithstanding, however, the general separation of the two systems, I propose that the main arteries of both should be brought to one and the same point before discharge into a common outfall pipe; so that the sewage water of the whole town may be diverted at the least cost to supply the demand that may at any future time be created for it for use as liquid manure.

Having thus determined the principle of drainage, the works may be described as consisting of—a centre well, an outfall-pipe, and a double system of tubular drains.

The centre well should be placed at the most convenient point of the lower area; it should be of depth sufficient to afford an effective fall to the drains communicating with it, and of capacity sufficient to retain the accumulations which must necessarily occur during the time the outfall would be closed by the tide.

The outfall-pipe should be laid from the centre well to the most convenient point along the shore, and continued to low-water mark, so that the sewage water discharged by it might at all times be diluted and carried away by the tide. Its material, where covered, might be earthenware; but at the mouth, and wherever exposed, it should be iron, and in size it need probably not exceed a diameter of one foot. This pipe should have two communications with the drains: one with the lower system, which might be closed at will; and the other with the upper, which would be always open.

The lower system of pipes should be limited to those houses

the drainage of which, from their relative situation with respect to the sea-level, must necessarily be intermittent; and the pipes should lead directly into the centre well, from which the sewage-water might be discharged periodically at or near the time of low-water.

The upper system of pipes would extend throughout the remainder of the town, and its main trunk should communicate directly with the common outfall pipe, so that discharge might always take place from it. The material of the pipes should be earthenware, glazed internally, and it is probable that a clay suitable for their manufacture might be found in the vicinity of the town. The form of the pipes should be cylindrical; and their sizes, calculated upon the quantities of sewage to be conveyed by each, would probably vary from a diameter of three inches to one of twelve inches.

Every house should communicate with the system, and that portion of the street surface-water which may not be conveyed away by means of open channels might be passed into it.

The house-communications generally should be three in number: one from the sink in the kitchen or wash-house, the second from the water-closet, and the third from the roofed and paved surface; and the two former, and in many cases the latter, would be trapped. The untrapped communications would be for the free circulation of air through the system, and should be carried up to the roofs of the houses.

The system would receive through its various communicating channels the whole of the slops and liquid refuse of the town, and all that portion of its solid refuse (including excrementitious matter) capable of removal by suspension in water; and in addition, a portion of the surface-water, with the solid matter washed up by and suspended in it.

All the existing cesspools, and those drains and sewers which could not be brought into the new system, should be abolished during the progress or on the completion of the works.

I am of opinion that the above works of refuse-drainage, so far as they extend under the public ways, or can be deemed public works, might be executed for a sum not exceeding 3000*l*.

It should be stated that the above estimate is based upon the supposition that the whole of the present sewers would be found unsuitable to form a part of the new system: it is probable, however, that many of these sewers are in a condition to allow of their being worked into the new system with advantage; and to whatever extent this may be the case, a corresponding reduction should be made from the amount given.

2. *Works of Suburban Drainage.*—The works of suburban drainage about to be described have reference only to the area

of marsh land lying to the north of the town and included within the district.

It is highly desirable that the Local Board of Health should early adopt measures to ensure the efficient drainage of this flat, the stagnant ditches of which now poison the air with their foetid exhalations; and thus, at the same time that they create an intolerable nuisance, inflict much injury upon the health of the neighbourhood.

It has been shown that the present sewage-irrigation of this marsh is effected in the coarsest and most slovenly manner; that its subsoil is loaded with water; and that the crops of grass produced upon it are by no means extraordinary in quantity.

I entertain no doubt that by the adoption of a better system of drainage and irrigation its fertility might be very largely increased; and that at the same time the nuisance at present arising from it might be completely abated.

I propose, 1st, To fill up and entirely abolish the whole of the open ditches upon it.

2ndly, To subsoil-drain the entire area with tubular drain-tiles leading into a main-pipe communicating with a well (which might be the centre well of the system of refuse-drainage) having an outfall into the sea.

3rdly, To irrigate the fields by means of moveable surface-pipes in the manner now practised in Scotland, a head of sewage-water from the upper system of drains being established for the purpose, and the liquid conveyed to convenient points by covered pipes.

The sewage-water of irrigation should be diluted to the requisite degree to destroy offensive smell.

These works are of that simple character that any further description of them would be superfluous; nor is it necessary here to enter into a calculation of the weight of the crops to be produced by their means; the high degree of fertility obtainable in properly drained and irrigated soils being a fact now generally known and admitted.

DISTRIBUTION OF CHARGES.—In order that the requisite funds for carrying out the works above described may be procured without the necessity of immediate heavy outlay by owners and occupiers, I recommend that the Board should exercise its powers, and sanction advances by way of loan for the full period of thirty years, by the Commissioners of Public Works or others, upon mortgage of the future rates, to be repaid by annual instalments of principal and interest.

Assuming that these advances would bear interest at the rate of 5 per cent. per annum, the annual expenses of the new works may be stated as follows:—

<i>For the Works of Water-Supply.</i>						
	£.	s.	d.	£.	s.	d.
Annual instalment of principal and interest,						
at 5 per cent., on 3800 <i>l.</i>	224	16	8			
Share of superintendence (say)	50	0	0			
				274	16	8
<i>For the Works of Refuse Drainage.</i>						
Annual instalment of principal and interest,						
at 5 per cent., on 3000 <i>l.</i>	177	10	0			
Share of superintendence (say)	50	0	0			
				227	10	0
Total	£			502	6	8

Supposing the system to be applied to every house in the town, these expenses would be met by an annual rate upon the house property of $4\frac{1}{4}d.$ (nearly) in the pound on the present estimated rental (15,893*l.*) for the works of water supply, and of $3\frac{1}{4}d.$ (nearly) in the pound for the works of refuse drainage.

The above sums, however, do not represent the total charge that would fall upon the town for the new works, as, to render these available, an outlay must necessarily be incurred for works upon private premises, the amount of which is not included in the estimate given. The Act provides, however, that this portion of the works also may be executed out of a public fund, raised upon mortgage of the rates, and repayable by instalments of principal and interest, precisely as in the case of the public works, the annual amount of instalment being levied from each particular property in the shape of a private improvement rate; and, supposing such a course to be adopted, the total annual charge to houses of the annual rentals of 5*l.* and 20*l.* may be stated as follows:—

<i>Total Annual Charge to a House of 5<i>l.</i> Rental.</i>							
For Water-supply:—				s.	d.	s.	d.
Public rate, at $4\frac{1}{4}d.$ in the pound on rental				1	9 $\frac{1}{4}$		
Private improvement rate (by annual instalment of principal and interest on 20 <i>s.</i> expended upon pipes, taps, &c.)				1	2 $\frac{1}{2}$		
Annual charge for water supply						2	11 $\frac{3}{4}$
For Drainage:—							
Public rate, at $3\frac{1}{2}d.$ in the pound on rental				1	5 $\frac{1}{2}$		
Private improvement rate (being annual instalment of principal and interest on 30 <i>s.</i> expended upon house-drains and watercloset pan)				1	9 $\frac{3}{4}$		
Annual charge for drainage						3	3 $\frac{1}{4}$
Total annual charge for both drainage and water supply						6	3

Total Annual Charge to a House of 20l. Rental.

For Water-supply :—		s. d.	s. d.
Public rate, at $4\frac{1}{4}d.$ in the pound on rental	.	7 1	
Private improvement rate (being annual instalment of principal and interest on 30s. expended upon pipes and taps)	.	1 9 $\frac{3}{4}$	
Annual charge for water supply	.		8 10 $\frac{3}{4}$
For Drainage :—			
Public rate, at $3\frac{1}{2}d.$ in the pound on rental	.	5 10	
Private improvement rate (being annual instalment of principal and interest on 40s. expended upon house-drains, sinks, and water-closet pan)	.	2 5	
Annual charge for drainage	.		8 3
Total annual charge for both drainage and water supply			17 1 $\frac{3}{4}$

The above charges—at least so far as the public works are concerned—are calculated upon the basis of the rating for the relief of the poor, as the only fixed rule that presents itself, and not that it is considered that such a distribution would be a strictly equitable one. The charge to each house for the new works should accord with the benefit each will derive from them, and the amount of benefit would hardly be in direct proportion to the rental. The scale of charges, however, will form a subject for the consideration of the Local Board.

I have the honour to be,

My Lords and Gentlemen,

Your very obedient servant,

T. W. RAMMELL.

APPENDIX.

EXMOUTH WATER-WORKS.

“ ONE of the heads of inquiry to be entered upon by the Inspector attending in Exmouth under the General Board of Health being that of the supply of water in the town, the proprietors of those works have prepared the following statement, in order to demonstrate to the Inspector and to the public the extent and power of those works.

“ The want of a proper supply of good water has for many years been a subject of great complaint amongst the inhabitants of the lower part of the town of Exmouth. Numerous small houses in that part are wholly without water, and many of the larger houses also; and those which have wells and pumps are generally unable to use the water arising from them for drinking or any other than slop purposes: and in all these cases the householders have to send their servants, or boys whom they employ for the purpose at some expense, to other places for the water necessary for the consumption of their families.

“ To remedy this defect, and in order to supply the public with a good and wholesome beverage at a cheap rate, a few individuals privately united in purchasing a good spring, forming reservoirs, and laying pipes for bringing water into the town. But it is to be observed that, notwithstanding the previous continued complaints of the want of good water, but few (comparatively) of the inhabitants have taken advantage of the opportunity thus afforded them.

“ In order that the subject may be better understood, the proprietors have arranged their statement under the following heads—namely, 1st, the nature and capabilities of the spring; 2nd, the relative height of water in the reservoirs as compared with the different parts of the town; 3rd, the terms on which the water is supplied to the inhabitants; and 4th, some general remarks:—

“ 1st. The nature and capabilities of the spring.

“ The spring, which can be proved to have existed for upwards of 20 years, and has been never known to fail, issues in a piece of ground formerly called Shute Meadow, but now enclosed by the proprietors, and is almost close to the town of Exmouth at the north-east end. Over this spring a large reservoir has been constructed, containing 2700 hogsheads, at the level to which the water will rise, which is between 13 and 14 feet from the spring. Up to the height of 12 feet in the reservoir the spring will produce upwards of 1200 hogsheads a-week in the winter, and from 500 to 600 hogsheads a-week in the summer; thus ensuring at all times, even in the driest summer, a plentiful supply. There is also a smaller reservoir constructed by way of reserve, supplied by the waste water from the larger one, and the smaller one contains about 1500 hogsheads.

“ 2nd. The relative height of the water in the large reservoir as compared with the different parts of the town.

“ Accurate levels have been taken, and it has been found that, when the water in the large reservoir is at the height of 12 feet from the bottom, the level of the height of that water as regards the different parts of the town would be thus :—As to the lower parts—

	Ft.	In.	
“ At the Turnpike . . .	34	8	from the ground.
“ „ London Inn . . .	31	8	“ „
“ „ Cross . . .	27	10	“ „
“ „ Round Tree . . .	28	8	“ „
“ „ Globe Hotel . . .	28	10	“ „
At Mr. Bickford's corner	24	10	“ „

“ And as to the higher parts—

“ At the back of the Beacon	Level with the ground opposite Mr. Langford's spirit-shop.
In Bicton-place . . .	Level with the ground opposite No. 8.
In Bicton-street . . .	Level with the ground opposite the house of Mr. Dennis.
In Fore-street . . .	Level with the ground opposite Stafford-place.

“ 3rd. The terms on which water is supplied.

“ These terms are explained in the prospectus annexed, but that they may be better understood an example is here given. The poor-rate is taken as the rule by which the rent for the water should be calculated, being at the rate of 1s. in the pound on the rateable value. Thus, if a person is rated for the property he occupies at a rateable value of 20*l.* he would have to pay 20*s.* a-year for the water, and be entitled for such payment to have in his premises a cistern capable of containing 35 gallons, and this being filled three times a-week would give him 105 gallons a-week ; but should he think that quantity too small, he could elect to pay a larger sum yearly and then have a larger cistern according to the terms of the table in the prospectus, but he could not pay a lower sum than 20*s.*

“ 4th. General remarks.

“ Thus, the whole of the inhabitants of the lower part of the town of Exmouth in want of a good supply of water can obtain it, if they think fit to do so ; and ten fire-cocks have been fixed in the most convenient places at the expense of the proprietors, that there may be a good supply of water in case of fire.

“ The object of the proprietors has been to improve the town and add to the comfort of the inhabitants, more than the receipt of a large return by way of interest on the capital expended.”