

On some of the causes of the high rate of mortality in Greenock : with an account of their origin, as well as of the measures which have been taken, and are still required, for their abatement or removal / by James Greenock.

Contributors

Wallace, James.
Royal College of Surgeons of England

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B
ON SOME OF THE CAUSES

The Epidemiological Society -
OF THE *from the author -*

HIGH RATE OF MORTALITY

IN GREENOCK,

WITH

AN ACCOUNT OF THEIR ORIGIN, AS WELL AS OF THE MEASURES WHICH HAVE BEEN
TAKEN, AND ARE STILL REQUIRED, FOR THEIR ABATEMENT OR REMOVAL,

BY JAMES WALLACE, A.M., M.D.,

FELLOW OF THE FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW; ONE OF THE SURGEONS TO THE GREENOCK
INFIRMARY, ETC.

[Being a Paper prepared for the Social Science Congress at Glasgow, September 24, 1860, and now Published for
Local Circulation, by Recommendation of the Council.]

WITH A REPLY TO STRICTURES ON CERTAIN STATEMENTS CONTAINED IN THE PAPER.



GREENOCK:

PRINTED BY ORR, POLLOCK & CO, AT THE TELEGRAPH NEWSPAPER OFFICE.

1860.

* * I take this opportunity of thanking those gentlemen, here and elsewhere, who have had the kindness to answer the queries which I found it necessary to put to them. At the same time, I subjoin the principal public authorities on which my statements are founded :—

Reports of Registrar-General for Scotland.
The Ninth and Twenty-first Annual Reports of the Registrar-General for England.
Census of Great Britain, 1851.
Greenock Census Returns for 1851, by John Adam, Esq., Town Chamberlain.
Crawford's History of Renfrewshire.
Weir's History of Greenock.
Greenock Infirmary Reports.
Greenock Mortality Tables for 1855, by John Adam, Esq., Town Chamberlain.
Local Police Acts from 1773 till present time.
Nuisance Removal Act.
Smoke Nuisance Act.
Common Lodging-Houses Act.
Shaws Water Acts, 1825 and 1845.
Report on Water-Supply by Committee of Water Trustees, 1827.
Contract between Shaws Water Company and the Water Trustees, 1838.
Sir James Clark's Edition of Combe on the Management of Infancy.
Statistical Report on the State of Glasgow, for 1859, by J. Strang, Esq., LL.D.
Fullerton's Imperial Gazetteer of Scotland.
Reports by Town Council on Burying Grounds of Greenock, 1845 and 1847, with
Observations by the late George Williamson, Esq.

J. W.

REPLY TO STRICTURES ON THE FOLLOWING PAPER.

[From the Greenock Telegraph of November 3, 1860.]

In preparing the paper which has lately appeared in these columns, I never for a moment dreamt that I would escape the charge of exaggeration or of false colouring. Nor have I been disappointed, for several have eagerly rushed into print to rescue the town from what is styled "unmerited obloquy." So far, however, as argument is concerned nothing has been produced to satisfy any person who would calmly and dispassionately examine the facts for himself, that the statements which I have made are, in any essential particular, wrong or inconclusive. They rather go to corroborate everything I have advanced, so much so that I would be quite content to wait till the returns of next year's census are made public, and to leave all cavillers to the pleasing delusion that I had met with a complete refutation, but for the fear that that section which exists in every community, and which a great statesman not long ago denominated "the dirty party," might construe my silence into a reason for adopting a *laissez-faire* or do-nothing policy. For the especial behoof, then, of this party, I venture to offer a remark or two, and chiefly on the charge which has been brought against the Registrar-General for having estimated the population of Greenock too low. I do this, not because I believe that that officer requires any champion, but because the calculations on which my paper is based are founded on the reports which he has published from time to time.

At the outset, then, I have to state that there are two modes of estimating a population—one consisting in taking note of the excess of births over deaths or the contrary, and the other in taking the average of the increase during the decade preceding the last census and adding this year by year till another census comes round. The former pre-supposes that no other change takes place in the population; the latter, on the other hand, recognises not only the ordinary increase by excess of births over deaths, but emigration and immigration as well. It is plain, therefore, that in the vast majority of instances the one last mentioned is the preferable mode.* It is, accordingly, the one adopted by statisticians in inquiries of this kind, and is the one employed by the Registrar-General for making a comparative estimate of the death-rate of one town with another. By it, as the first of my tables showed, Greenock is found, to use the words of Mr Allison, to be "one of the unhealthiest towns of Scotland." The Master of Works, however, calls the fact so demonstrated "an erroneous impression," on the ground that the excess of births over deaths would make the population over 40,000, and not under 38,000 merely, a result which, he further believes, must be supported by the fact of the great increase in workmen's houses, as well as by a *hypothetical* calculation of

the numbers living in each house. The increase in workmen's houses is, no doubt, a fact, and the calculation may turn out to be something more than hypothetical, but did it never occur to Mr Allison that the same may be true of the other large towns, particularly Glasgow and Dundee, with both of which Greenock occupies in the matter of health a position which may well be called unenviable? As to the estimate of the population from the excess of births over deaths, it is quite possible, indeed not at all unlikely, that there are exceptional instances of towns increasing more in this way than others, and that Greenock may be one of these. In fact, the Registrar-General in his report for 1858 admitted this, and made calculations accordingly, as will be seen from the following extract:—

"The population has been estimated on the usual principle of supposing that the present increase is similar to that which occurred between 1841 and 1851. In the accompanying tables, however, is given, along with the estimate for 1858, the population as deduced from the excess of births over deaths since the Registration Act came into operation—i.e., giving, by the census increase, the numbers to the middle of 1855, and from that date to the middle of 1858, the actual increase of births over deaths. This mode of calculation under-estimates the actual increase in Glasgow and the larger towns, as it takes no notice of the immigrants, so that for such towns the usual mode of calculation gives the nearest approximation. From circumstances, however, which do not require to be here specified, the increase of births over deaths probably gives the nearest approximation to the population in the case of Paisley, Greenock, Leith, and Perth."

In like manner he reported for 1859, the death rate, calculating from the birth estimate of the population, which he thus tabulated, being found in 1858 to be for the eight towns, taken in their usual order, respectively, 1 in 32, 41, 38, 48, 39, 36, 45, and 38, and in 1859, 1 in 34, 47, 40, 46, 42, 28, 51, and 45, so that really the *relative* position of Greenock is in this matter essentially the same as that brought out in my first table.* Whatever differences, however, may exist will be considerably lessened if accordance is given to the opinion of the Registrar-General that this mode of calculation under-estimates the population of Glasgow, Edinburgh, Dundee, and Aberdeen. To show that this opinion is a reasonable one, I have simply to call attention to the fact, that Dr Strang, who is surely as much entitled to rank as an authority as Mr Allison, makes the population of Glasgow, in his last report to the magistrates of that city, no less than 407,000†, so that in a *comparative* estimate, the result as between Greenock and Glasgow would, from these figures, be

* I stated this in reply to Mr Allison's remarks at the second day's meeting of the Sanitary Section of the Association. For some reason, however, which is perhaps best known to the Editor of the *Greenock Advertiser*, my reply did not appear in the report which he gave of the proceedings.

† Taking in the portions of the Barony and Govan parishes beyond the Parliamentary boundary, he estimates the population at no less than 440,000.

* The best mode, of course, if at all attainable, would be one essentially the same as this, but in which, at the same time, allowance would be made for what mathematicians would call the *disturbing force* arising from an extraordinary birth-rate.

far more unfavourable to the former than what has actually been made out by the Registrar-General.

But it may be objected that the Registrar-General, though he urges a satisfactory reason for doing so, and has sources of information available only to himself, does not make the population, from the birth-estimate, high enough—not so high as Mr Allison, who, computing the excess of births over deaths from 1851, makes it no less than 42,872. Will the *relative* position of Greenock, however, be much altered in this way? To ascertain this it will be necessary, keeping for the reason given above by the census estimate for Glasgow, Edinburgh, Dundee and Aberdeen, to get the average increase by excess of births over deaths for the other four towns. Now, for the five years ending 1859, the excess of births over deaths was for Paisley, Greenock, Leith, and Perth, respectively, 2430, 2783, 2218, and 711, so that there was an average increase in this way of 487, 556, 443, and 142 per annum. Assuming, for ease of calculation, that the last census was taken on January 1st, instead of March 30th, 1851, as was actually the case, the population of these towns on January 1st, 1855, would be the population at last census *plus* four times the average increase just given, and this would be found to be equal for the four towns respectively to 50,019, 39,660, 33,991, and 26,009. The real excess of births over deaths for each of the subsequent years being known and regularly added, the population at the end of 1855, 1856, 1857, 1858, and 1859, will be found to be as under :—

TABLE A.

Pop. at end of 1855		1856	1857	1858	1859
Paisley	50,350	50,922	51,274	51,792	52,457
Greenock ...	40,026	40,703	41,387	42,112	42,440
Leith	34,443	34,775	35,257	35,680	36,209
Perth	26,101	26,332	26,337	26,436	26,720

Calculating from these numbers, the death-rate for the eight towns will be found to be as follows :—

TABLE B.

	1855	1856	1857	1858	1859	Aver.
Pop. as by birth estm. census inc.	One in	One in	One in	One in	One in	One in
Glasgow	33	35	33	33	35	33.8
Edinburgh...	40	42	47	43	49	44.2
Dundee	39	32	44	39	41	39.
Aberdeen ...	46	47	45	48	47	46.6
Paisley ...	38	46	35	40	44	40.6
Greenock ...	29	32	33	38	29	32.2
Leith	51	42	47	45	50	47.
Perth	40	47	33	39	47	41.2

From this it is evident that Greenock is not only "one of the unhealthiest towns of Scotland," but actually the most unhealthy. And even if the preposterously low estimate of the population from the birth increase for the four larger towns be admitted, "the erroneous impression," as the Master of Works is pleased to term it, will still be found to obtain, the average rate for the five years ending 1859 being equalled only by that of Glasgow, as will be seen by the following table :—

TABLE C.

Pop. estimated by birth increase.	1855.	1856.	1857.	1858.	1859.	Aver.
	One in	One in	One in	One in	One in	One in
Glasgow ..	32	34	31	31	33	32.2
Edinburgh	39	40	44	40	46	41.8
Dundee ...	33	35	38	37	39	37.4
Aberdeen .	45	46	45	48	47	46.2

So much, then, for part of Mr Allison's charge that the Registrar-General "greatly over-states the per-centage of mortality" and that "Dr Wallace's statements are also "wrong in data."

But Mr Allison is not the only writer who attempts to *buff* the Registrar-General, for he is seconded by a person who pounces upon that officer for the way in which he has stated the great mortality occurring in children. This would-be statistician, however, does not understand the question. He tries to prove that "there is no truth in the assertion that our young children die at the rate of 60, 50, 40, or even 30 out of every 100, or that we have a greater mortality than other towns,"—in fact, that the great infantile mortality is "a delusion." He evidently means that this mortality is alleged to take place annually in every 100 born or living. If he reads the reports *carefully* however, he will see that the Registrar-General never puts the mortality as he has stated it. What the Registrar-General actually does say is that of the deaths occurring in a particular town, 30, 40, or 60 per cent, as the case may be, take place in children below the age of 5; and this, I believe, for the great practical purpose of rousing the authorities in different places to a sense of the necessity of being vigilant as regards the public health, is in the long run as useful a mode of showing the result as any of the others employed by writers on this subject. To make this clear the Registrar-General himself actually made, in his last annual report, a calculation of the per-centage of deaths occurring in the estimated number of children living below the age of five, the table thus formed completely corroborating the result given in the other way. To make the matter still more distinct, and more especially as the Registrar-General's estimate of the population has been disputed, I shall construct a table for the four years ending 1859 on the estimate given in Table A for the four smaller towns, and on the census estimate for the four larger. I have to state, then, that at the last census the number of children living below the age of five was in Glasgow, 40,719, Edinburgh and Leith, 21,901, Dundee, 9,170, Paisley, 6,204, Greenock, 4,781, and Perth, 2,823. From

* The population of these towns, calculated as for the others in table A, is as follows :—

TABLE D.

	1855	1856	1857	1858	1859
Glasgow.....	349,120	354,083	358,517	362,935	368,049
Edinburgh...	166,695	167,862	169,409	170,405	172,197
Dundee.....	85,042	85,977	87,304	88,447	89,703
Aberdeen...	76,467	77,227	77,904	78,687	79,422

these figures the numbers for the last four years will be found by simple proportion to be as under—

Children below 5 years.		1856	1857	1858	1859
Calculated, except for Leith, from cens. estim.	Glasgow	45,400	46,337	47,273	48,073
	Edin. and Leith	23,659	24,007	24,349	24,703
	Dundee	10,583	10,784	11,007	11,220
	Aberdeen	9,764	9,884	9,872	9,946
Calculated from birth estim.	Paisley	6,571	6,618	6,670	6,770
	Greenock	5,198	5,285	5,378	5,420
	Perth	2,921	2,922	2,936	2,964

From this, again, the deaths in children below the age of 5 being known, the following results are obtained :—

Per centage of deaths in children below the age of five to the numbers living at that age.

	1856	1857	1858	1859	Aver.
Glasgow	11.98	13.25	13.06	11.59	12.47
Edin. and Leith	9.01	6.67	8.64	6.24	7.64
Dundee	12.79	9.67	10.52	9.46	10.61
Aberdeen	6.04	5.79	4.92	6.02	5.69
Paisley	7.82	10.	8.86	7.31	8.49
Greenock	11.13	11.44	9.91	14.24	11.68
Perth	6.12	10.02	8.20	5.83	7.54

so that Greenock is in this respect exceeded only by Glasgow, a result which will be found to be still the case, even although the extremely low estimate of the population of the four larger towns be taken as the basis of the calculation, as will be seen from the following table, which is founded on Table D :—

Population below the age of five estimated from excess of births.

Pop. at end of 1856		1857	1858	1859
Glasgow... ..	43,811	44,359	44,906	45,539
Edin. & Leith...	22,891	23,120	23,281	23,543
Dundee	10,229	10,387	10,523	10,673
Aberdeen.....	9,670	9,755	9,853	9,945

Per-centage of deaths in children below five to population as above.

	1856	1857	1858	1859	Average
Glasgow	12.42	13.85	13.75	12.24	13.06
Edin. & Leith	9.31	6.93	9.04	6.54	7.95
Dundee	13.23	10.04	11.	9.95	11.05
Aberdeen	6.11	5.87	4.94	6.02	5.73

If my opponents are satisfied with this result, I have simply to remark that, irrespective of the great disparity between Greenock and five of the towns brought into comparison, the average death-rate in children living below the age of 5 in the whole of England was, for the 10 years ending 1857, only about 6½ per cent. As to what this exactly means, I may state, farther, that the greatest living authority on this subject, Dr Farr, calculating for the seven years ending 1838-44, during which the per-centage was for England and Manchester, respectively, 6.5 and 12.9, shows conclusively that of the children born alive

in England, 26 per cent., or more than a fourth, and in Manchester upwards of 48½ per cent., or nearly one half, die within the first five years of life—a calculation made in the same way for sixty-three healthy districts in England, and for the five years ending 1858, showing that not more than 17½ per cent. die, or at the annual rate of 4.6 per cent. of the numbers living below the age of 5. As to the general death-rate of 1 in every 32 of the population, or about 31 per thousand, it should be remembered that it greatly exceeds that for the whole of Scotland, which was in 1859 only 19.7, as well as that for the whole of England, which, for the 21 years ending 1858, was 22 per thousand. If it is considered, moreover, that the Registrar-General for England has shown that a healthy death-rate should stand about 17 per thousand, it will surely be admitted that the sanitary condition of Greenock must be enormously defective.

Returning now to Mr Allison, another palliating circumstance in the high rate of mortality in Greenock is, according to that writer, the fact, that many patients are brought from a distance to the Infirmary, and, dying in that institution, add to the returns, but without any allowance being made by the Registrar-General. But is this a peculiarity of Greenock only? Does not the Edinburgh Infirmary absorb patients from the whole of Scotland, the Glasgow Infirmary from the West of Scotland, and the Paisley Infirmary from the Upper Ward of Renfrewshire, and are not the Dundee, Aberdeen, and Perth Infirmaries county institutions? Where then is the palliation? Still studiously avoiding comparison with other towns, the Master of Works offers it in another way, by attempting to show that the mortality has not been so great during the last seven years as during the previous seven, and makes out a balance in favour of the former of 1252 lives saved. And this he evidently would ascribe to the sanitary operations which have been carried on for the last few years, and for which, as being the groundwork of what is still required, I have had the greatest pleasure in giving to himself and the authorities the credit which is their due. But it must be observed that during the first seven brought into comparison, the town was ravaged by a terrible epidemic of fever, and an equally terrible epidemic of cholera, to both of which the excess of deaths in the period referred to must be attributed. In the last seven years, on the other hand, what there was of cholera was, from certain favourable climatic conditions, not so severe as during the previous epidemic, and occurred, besides, *before the great drainage operations were well begun*, while what there was of fever manifested itself in an epidemical form only in 1857, and then not to such a degree as during the previous epidemic, isolated cases having only since occurred, and to so small an extent that the fever wards of the Infirmary have been almost entirely empty. It may be said that this establishes Mr Allison's position; but it should not be forgotten that the whole country has been equally free of cholera as Greenock, and that the immunity from fever which we at present enjoy is shared in not only by the large towns of England and Scotland, but, if I mistake not, by Continental Europe as well, and that, moreover, in towns where no great schemes of sanitary improvement have been as much as projected. Besides, there are other zymotic diseases than fever, and from this class, as I have shown, Greenock has

suffered during the four years ending 1859 more than any other of the large towns of Scotland.

Nor can Mr Allison strengthen his position by his attempt to prove that the good effects of the draining are manifested in 1858 and 1859 not only in a diminished death rate in the only parish (the Middle) which has its main sewerage completed, but also in a more favourable rate than that exhibited by the other parishes—the East and the West. Had he succeeded in this, none would have rejoiced more heartily than myself, but in face of the fact that “the leading and trapping of tributary drains has,” by his own showing, “been as yet but partially attended to,” as well as the fallacy which pervades his figures, I cannot allow him to lay the flattering unction to his soul that he has even as much as scotched the snake. Mr Allison raises an outcry against the Registrar-General for making the population of Greenock too low, and yet when it suits his own purpose he has no hesitation in taking merely the census enumeration of 1851 and keeping it without any addition for increase of population not only for 1855, but also for 1856 7-8 9—forgetting all the while his argument in palliation of the unhealthiness of the town itself, and derived from the fact of the increase of population, as evidenced by the excess of births over deaths, and the large addition to the number of workmen's houses. Besides, it appears never to have occurred to him that this increase of houses has taken place chiefly, in fact almost entirely in the East and West Parishes, and that the excess of births over deaths is in them also proportionally greater than what has taken place in the Middle. It is plain, therefore, that his figures cannot be depended on. But in addition to all this, the argument in reference to the Infirmary which I have shown to be inadmissible in the comparison between town and town, applies here with peculiar force as between parish and parish of the same town, for every one well knows that in this quarter there is only one Infirmary, which is situated in the West Parish, from the deaths taking place in which, accordingly, a drawback must be made of those occurring in the case of persons belonging not only to the town of Port-Glasgow and other places in the neighbourhood, but also to the East and Middle Parishes as well. With this object in view I have put myself to the trouble of examining the registers of the Infirmary, and find that for 1855-6-7-8 9 respectively there must be deducted from the deaths which took place in that institution, and were therefore registered as occurring in the West Parish, 35, 56, 47, 34, and 39, which must be disposed of as under:—

Belonging to	1855	1856	1857	1858	1859
Port-Glasgow, &c	11	9	15	5	10
East Parish	5	8	6	5	9
Mid Parish.....	19	39	26	24	20

Taking, then, the births and deaths from the local registrars' books, and making the correction thus shown to be necessary, I find that the average increase by excess of births over deaths, for the four years ending 1859, was for the East Parish, 236.8, for the Mid, 90, and for the West, 232.2. If these numbers be multiplied by four, and the result added to the population of 1851, that for the beginning of 1855 will be obtained. The increase in the different

parishes being known and added, as was done in the general table given above, the following will be found to be the population for the end of—

	1855	1856	1857	1858	1859
East Parish	8,826	9,076	9,353	9,662	9,835
Mid do.	9,788	9,911	10,009	10,159	10,215
West do.	21,416	21,726	22,038	22,302	22,416

From which it will be found that the deaths per thousand are as follows:—

	1855	1856	1857	1858	1859	Aver.
East Parish...	35.3	34.0	33.1	23.1	34.6	32.
Mid do. ...	37.9	34.9	33.5	28.2	34.7	33.8
West do. ...	31.9	26.4	27.7	25.7	31.9	28.7

a result entirely opposed to the finding of Mr Allison. And this result would be still more decided if a corresponding correction could be made for the deaths which occurred in two other institutions (to mention no other) in the West Parish, viz., the Poorhouse and Asylum, and in the case of persons admitted from the East and Mid Parishes, as well as Port-Glasgow and other places at a distance, for, as every one knows who has had anything to do with the former of these, at all events, a great number of the patients are sent in really to get a comfortable bed to die on, and that the majority of the inmates are received from the very parish whose death-rate, by his way of putting it, sets Mr Allison into a flutter of exultation. In consequence, however, of the registers of the Poorhouse not giving the streets from which the inmates were received, I am unable to make the corrections as I would have wished. At the same time, the simple statement that the deaths in the Poorhouse and Asylum were for 1855 6 7-8-9 respectively 75, 46, 62, 51, and 31, will suffice to show that the numbers to be eliminated are not inconsiderable. Besides, if Mr Allison intends to point to the fact that the per centage of deaths from scarlatina was in 1859 a little less in the Middle than in the East and West Parishes—a fact which I at once admit, the examination which I have made of the registrars' books, showing that 80 died from this disease in the East, 56 in the Mid, and 130 in the West, or at the rate of 0.81, 0.54, and 0.57 per cent. of their respective populations—does he not see that this, when compared with the table given above, only proves the truth of the opinions I advanced in the pamphlet which I published in January last, and which are embodied in the following extracts:—

“It should not be forgotten that, if there is a constant thinning of the younger portion of the population from diseases of an ordinary character, but at the same time clearly traceable to the causes of which I have drawn but a faint outline, it must be evident that in the long-run there will be in localities so situated actually fewer children for the pestilence to attack.”

“There can be no doubt that very much of the prevalence and extension of such diseases as measles, scarlatina and hooping-cough, is to be attributed to the great difficulty of keeping the children of different families from associating with each other. Notwithstanding this, there is as little doubt that very much could be done in the way of prevention, if parents would

conscientiously keep the whole of their children out of school when any single member is affected, and if teachers or governors of educational institutions would insist on their withdrawal for at least two months after convalescence has fairly begun. In fact, they should not be allowed to return without a medical certificate to the effect that all risk of contagion was past. . . . And here I may observe, that very probably the greater regularity in attendance upon schools, on the part of the children of the well-to-do classes of the community, may be one of the causes why, as has been alleged, the most filthy district of the town has suffered less in the present epidemic of scarlatina, than localities where the people are on the whole in comfortable circumstances—it being a notorious, and at the same time a lamentable fact, that comparatively few children of the lower orders are ever sent to school, and if at school, are in times of sickness taken out by their parents without any hesitation, because of the assistance which they may give in the performance of certain duties which the latter cannot overtake themselves.”

Be all this, however, as it may, even though the Master of Works had proved what he alleges, it would only have been a corroboration of the statements and recommendations which I have advanced. And if the epidemic of scarlatina “which followed the severe drought” of the summer of 1859, be admitted as an effect as well as a sequence, as Mr Allison evidently would have it, the fact of the Corporation reservoirs being “emptied to the silt in the bottom” cannot be accepted as a palliation, for it only clearly establishes the position which I have taken in regard to the authorities having neglected to secure proper storage for the rain which, during the first three months of the year, “fell without intermission.” As to whether the epidemic was really caused by this I shall not stop to examine, nor shall I enter into any lengthened argument with Mr Allison as to the cause of the epidemic of fever in 1843 and 1847, and of cholera in 1849, for the simple reason that a much more extensive induction than Mr Allison has the slightest conception of has established, beyond the possibility of cavil, that whatever may be the origin of such diseases, it is only where overcrowding and filth with their concomitants are found that they ever attain anything like intensity, or spread in an epidemical form. This I have shown conclusively as respects Greenock in the Table of Streets. If Mr Allison means that poverty brought on by stagnation of trade, and when food is high in price, aggravates the physical evils just mentioned, and in that way renders those subjected to its influence more susceptible of disease—but disease not necessarily of a contagious or infectious character—then he and I are so far at one. But if he means that poverty induced, as he has stated, was the cause of the epidemics referred to, all that I have to say is that he is much more easily satisfied than the great majority of those eminent authorities who have devoted the best energies of their lives to the investigation of subjects such as this. To show the absurdity of straining this mode of argument, I shall only call attention to the cholera epidemic of 1849, which, travelling from India, followed a track nearly identical with that which it took in 1832, and seized with a virulence almost without exception, and almost at the same time, beyond the reach of relief, upon villages and towns and even parts of towns which were notorious for their filthy character, and in which the great warning of 1832 had been allowed to pass unimproved. In truth Mr Allison would appear to have himself a suspicion that he is here treading on treacherous ground, for knowing that in 1849 wheat was only 44s per quarter, and that

the deposits* exceeded the withdrawals from the Provident Bank by L.5881, when speaking of the epidemic of 1854, during which wheat was 64s per quarter, and the deposits over the withdrawals only L.3121, he passes off from the poverty hypothesis and fastens upon the fact of the ship “Conway” coming to these shores, carefully concealing or being ignorant of this other fact, that the disease was before that, or nearly at the same time, raging in Glasgow and other places in the West of Scotland, and with a result which afforded a fitting parallel to what was noticed in 1832 and 1849, the dread enemy finding its prey in the very localities where it had on these occasions numbered its victims by hundreds. It was no doubt, as I have already said, less sweeping in its force than during its first and second visitations; but for this an explanation is to be found not in the improved condition of the town or of the working-classes, but chiefly in certain climatic influences, more particularly high winds, which prevented that stagnation of the atmosphere such as existed to a very marked degree about Newcastle and some of the other parts of England which the fell destroyer held in his gripe. But even though the alleged effects of poverty be in this respect admitted to their fullest extent, should it not be a strong incentive to our authorities, knowing, as every one does, that even honest poverty is apt to hide itself in the lanes and bye-ways of towns, and to shrink from the gaze of the more successful in life, to strain every nerve to cleanse out those nests of pollution, worse a thousand times than the Augean stables of classic story, so that the unfortunate victims of commercial depression, when struck down by disease, may have those great essentials to recovery—ample space, pure air, and the free and uninterrupted light of heaven.

But the most extraordinary piece of special pleading is to be found in the following:—

“In a sanitary point of view, Greenock is now greatly benefited in the article of cheap coal, which in winter gives warmth and comfort, and with these health, where houses are built on a damp, clay soil. This has been obtained by means of rails which connect the harbours with the Caledonian Railway and the Lanarkshire Coal Basin. The Harbour Trustees are now busily engaged laying

* To show how little dependence is to be placed, notwithstanding “his long and intimate connection with the town’s affairs,” on Mr Allison’s inferences from the Provident Bank accounts, I have to call attention to the year 1842, when “there was drawn out of the Savings’ Bank £12,795 more than was lodged,” but not as he would have it, in consequence of dull trade and the high price of grain. The real cause is to be found in the failure in that year of the Renfrewshire Bank (not to speak of that of the Paisley Savings Bank and the Leith Bank), which created, as was natural, a general distrust in the other local banks, the Provident not recovering its position till 1846, when wheat was 4s dearer per quarter than it had been in the interval. As for the years 1859 and 1851, those conversant with the working of the institution know of certain circumstances, unconnected with the price of grain, which contributed to a high deposit account, such as the additional facilities offered to customers by opening during the day as well as in the evening, the favourable rate of interest given, and the relaxation of the rule in regard to the receiving of large deposits. As to 1859, the money deposited exceeded the money drawn by £8700, and not £2222 merely—a fact which the gentlemen who took part in the proceedings of the annual meeting of the Directors looked upon as a proof that the class thrown out of employment in that year opened but few bank accounts when work was plentiful and wages good. As respects the illustration from 1835, when the balance was favourable because of wheat being only 39s 4d per quarter, I have simply to state that the balance was still more favourable in 1836, 1838, and 1840, when wheat was for these years respectively 48s 6d, 64s 7d, and 66s 4d per quarter.

rails all round the harbours, which, when completed, will encircle the town on the north, and will not only enable merchants, shipowners, and manufacturers to get cheap coal with great dispatch, but will bring an essential article of comfort to the end of nearly every street. The trade of the port is yearly increasing, and the means of remunerative employment is augmented. The revenues of the Customhouse for the last two years at our port are:—

1858,	...	...	£655,162	16	9
1859,	...	...	802,842	1	4

thus showing the progress which the port has made."

Is Mr Allison really serious here? How can the running of rails along the harbours be the means of cheapening coal to the inhabitants? It may be the means of reducing their price to the shipowners, for the speedy loading of whose vessels alone, with this and other commodities, the line of rails was laid, but how manufacturers will in this way "get cheap coal with great dispatch," and how, although the rails were round the whole of the harbours, he can make out that "this essential article of comfort" will be brought "to the end of nearly every street," I must confess I, for one, am unable to perceive. Besides, if "Greenock is now benefited in the article of cheap coal," is not the gratifying fact more the result of the enterprise of the Caledonian Railway Company than of any effort made by the authorities, even although it be admitted that the laying of the rails was done at the expense of the latter? And if "the trade of the port is greatly increasing and the means of remunerative employment is augmented," and if, as Mr Allison says in another place, "there has been a progressive improvement in the condition of the industrial population," does he not see that he is only lending additional weight to the opinion that it is a disgrace to the community that the state of matters which I have represented has been allowed to continue so long?

The greatest argument in my favour, however, is the fact, that most of the recommendations as to what should be done by the authorities, are in accordance not only with what I have lately shown to be necessary, as well as with what I suggested in January last, but also with what was proposed by the district surgeons, who reported on this subject to the Parochial Board—a fact which proves that what was then written has not been in vain. But while gratified with this result, I have to observe, that if Mr Allison's recommendation that "an additional number of public conveniences be erected for the male portion of the population, at suitable distances," be meant to supersede the obligation resting on individual feuars to provide their tenants with proper ashpit and privy accommodation, I must here enter my humble, but most decided protest—for what will these avail in the case of females and children, whose interests in this respect are surely as much worthy of attention as those of the male portion of the community?

As to the recommendation that part of the Infirmary be devoted to the reception of sick children, I can assure Mr Allison that neither I nor the other medical officers, nor the directors of that institution, would have any hesitation in admitting patients of this class. At pp. 22 and 23, however, of the pamphlet referred to, I have shown the great difficulty practitioners meet with in getting adults even to leave their houses, no matter how wretched, and that in the case of children the difficulty is still greater—an instance of which may be found in the fact, that though, during the late epidemic of scarlatina, the directors invited the medical men in town to send as many of the afflicted poor as

possible, only fifteen labouring under that disease were admitted in 1859, and of these only four were below the age of ten. As to the necessity of a Parliamentary measure for the supplying of medical aid during times of epidemics, I am afraid that no Government in the present state of sanitary legislation would ever, except perhaps in the case of cholera, even as much as dream of proposing such a thing. Not to speak of other considerations, the true sanitary reformer would rather say, cleanse out your foul lanes and alleys, open up your narrow courts, let into your houses the pure air and light of heaven, observe personal cleanliness, be regular as to when, and temperate in, as well as studious as to what, you eat and drink, and careful as to how you clothe yourselves, and there will be little need for the doctor to combat the enemy in his den, and none whatever for your fearing to let even the cholera ship approach your shores.

Having thus shown that the attempts of Mr Allison and others to palliate the defective sanitary condition of the town are things of "shreds and patches" which will not bear for a moment the breath of fair and legitimate criticism, and having also shown that not a little of what Mr Allison proposes as new is liable to exception, I have only to say in conclusion, that if I have written in strong, and as some may think, rather unmeasured terms, it is only because I have the real welfare of my fellow-townsmen at heart, and because I believe that many of the evils which I have detailed are really within the reach of the remedies we already possess. I have always been of opinion not only that the town, situated as it is on a commanding slope, and with a water-supply rarely paralleled, might be one of the cleanest in the kingdom, but also that a proper interpretation of the apparent climatic disadvantages under which it labours, and a wise course of action (public as well as private) following thereupon, would be sure to be attended with a vast improvement in the general health of the community. As to whether I have shown how the teachings of nature are to be obeyed, it is not for me to determine, but this I have no hesitation in saying, that the good results which every man really anxious for the fair reputation of "his native town" would like to see effected, are not to be brought about by any attempts at whitewash, in face of such a fact as this—a fact which Mr Allison must know as well as I do—that the working of the Nuisance Removal Act has in this place been worse than a sham; to give an idea of which, to mention only one instance, I have merely to state that the very nuisance behind Main Street, Cartsydyke, which was condemned after a defence by no fewer than four lawyers, has been allowed to get into as bad a state as ever. I earnestly call, therefore, upon every man who has a child to love and a home to cherish, and who has not yet forgotten the anxiety which he felt when the town was passing through the terrible ordeal of last year, and who can, therefore, conceive of that which blanched the cheek of many a mother, to rise up, fearless alike of the frown and the sneer of power, and not to leave a stone unturned, until the authorities are driven into a course of action commensurate, in some degree at least, not only with the means which they have at their command, but also with the difficulties which they have to encounter. If successful in this, I shall feel myself more than rewarded for the time spent in the preparation of my paper, and shall not regret that a controversy has arisen entailing on me the necessity of writing in its defence.

Greenock, October 27, 1860.

ON SOME OF THE CAUSES

OF THE

HIGH RATE OF MORTALITY IN GREENOCK,

WITH AN ACCOUNT OF THEIR ORIGIN,

AS WELL AS THE MEASURES WHICH HAVE BEEN TAKEN, AND ARE STILL REQUIRED,
FOR THEIR ABATEMENT OR REMOVAL.

BY JAMES WALLACE, M.D., &c.

[PAPER PREPARED FOR THE SOCIAL SCIENCE CONGRESS AT GLASGOW, SEPTEMBER 24, 1860.]

THE unenviable position which Greenock has acquired in the mortality tables of the Registrar-General for Scotland is a sufficient excuse for my venturing to appear before this Association. This position, I have no doubt, is already so well known to not a few now before me, that I might at once proceed to an exposition of the causes which have in the main led to it. For the sake, however, of those who have been paying but little attention to this matter, and more especially those who have come from a distance, I shall, before doing so, give a general resumé of the mortality returns of Greenock comparatively with those of the other large towns in this division of the kingdom. This will be taken chiefly from the tables of the Registrar-General, but partly

also from other documents to which I have had access. Commencing then with 1855—the first year of the registration in Scotland—I find that out of an estimated population of 37,623 there died 1,364, being at the rate of 3.62 per cent, or 1 in 28; the proportion for Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, and Perth, being respectively 1 in 33, 1 in 40, 1 in 39, 1 in 46, 1 in 36, 1 in 52, and 1 in 41; so that Greenock was in that year nearly twice as unhealthy as Leith. In 1856, again, 1857 and 1859, Greenock stood equally high, an exception occurring only in 1858, when Glasgow exhibited the highest proportion of deaths, in consequence of an epidemic of scarlatina. But this will be best seen from the following table:—

Table showing the Comparative Mortality in Greenock and the other large towns of Scotland for the five years ending Dec. 31, 1859.

	1855.			1856.			1857.			1858.			1859.		
	Estimated Populat'n	Deaths.	Rate.	Estimated Populat'n	Deaths.	Rate.	Estimated Populat'n	Deaths.	Rate.	Estimated Populat'n	Deaths.	Rate.	Estimated Populat'n	Deaths.	Rate.
			1 in			1 in			1 in			1 in			1 in
Glasgow...	359,369	10,637	33	366,937	10,280	35	374,505	11,373	33	382,073	11,469	33	388,537	10,832	35
Edinburgh	172,064	4,258	40	174,658	4,136	42	177,260	3,783	47	179,863	4,190	43	182,464	3,703	49
Dundee...	87,163	2,183	39	89,947	2,453	32	90,731	2,242	44	92,515	2,332	39	94,299	2,270	41
Aberdeen.	77,031	1,668	46	77,982	1,659	47	78,933	1,724	45	78,840	1,613	48	79,429	1,676	47
Paisley...	48,103	1,323	36	48,236	1,098	44	48,269	1,440	33	48,302	1,275	38	48,335	1,185	40
Greenock.	37,628	1,364	28	37,676	1,237	30	37,724	1,268	29	37,772	1,085	35	37,820	1,420	26
Leith...	34,611	663	52	35,209	826	42	35,807	747	46	36,405	791	46	37,003	699	53
Perth....	26,893	644	41	27,256	559	48	27,619	784	35	26,397	665	39	26,499	560	47

So far, then, as the *general* results go, Greenock is proved to be the most unhealthy of the eight principal towns of Scotland. Nor will this appear less striking when certain groups of diseases are taken into account. Taking the zymotic, it will be found

that while in 1857 Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith and Perth, had a mortality from this source of 1 in 111, 1 in 286, 1 in 289, 1 in 225, 1 in 106, 1 in 187, and 1 in 105, Greenock had a mortality of 1 in 103. In this particular it was

exceeded in 1858 by Glasgow and Paisley, in consequence of the prevalence of scarlatina in both of these places, and of hooping-cough, besides, in the latter; but in 1859 it more than resumed its former position, the mortality in that year being at the rate of 1 in 69, while that for Glasgow, Edinburgh, Dundee, Aberdeen, Paisley, Leith, and Perth, was respectively, 1 in 119, 1 in 261, 1 in 133, 1 in 208, 1 in 169, 1 in 263, and 1 in 219. This enormous disparity arose chiefly from a severe epidemic of scarlatina, which cut off no fewer than 271 persons, 267 of whom were below the age of 20.

Table showing the death-rate from diseases of the *zymotic class* for the four years ending Dec. 31, 1859.

	RATE.				Average Rate.
	1856	1857	1858	1859	
	One in	One in	One in	One in	One in
Glasgow.....	124	111	124	122	120
Edinburgh.....	156	286	202	269	228
Dundee.....	97	189	154	137	144
Aberdeen.....	203	223	277	210	228
Paisley.....	143	106	139	163	137
Greenock.....	92	103	156	69	105
Leith.....	126	187	177	268	189
Perth.....	229	105	183	226	185

Nor can a better account be given of the mortality from the tubercular class of diseases, the deaths from this source being in Greenock invariably higher than in any of the other large towns, as will be seen from the following table :—

Table showing the death rate from diseases of the *tubercular class* for the four years ending Dec. 31, 1859.

	RATE.				Average Rate
	1856	1857	1858	1859	
	One in	One in	One in	One in	One in
Glasgow.....	202	181	184	191	189
Edinburgh.....	238	234	214	252	234
Dundee.....	243	194	212	234	220
Aberdeen.....	247	205	231	236	229
Paisley.....	282	195	193	201	217
Greenock.....	186	156	168	166	169
Leith.....	276	303	300	308	296
Perth.....	229	246	229	262	241

Taking *consumption* alone, it uniformly stands highest in Greenock, the mortality being as follows :

	RATE.				Average Rate.
	1856	1857	1858	1859	
	One in	One in	One in	One in	One in
Glasgow.....	291	258	271	262	270
Edinburgh.....	360	354	317	355	346
Dundee.....	340	284	286	328	309
Aberdeen.....	399	296	327	374	349
Paisley.....	412	283	254	258	301
Greenock.....	259	234	224	227	236
Leith.....	445	436	433	430	436
Perth.....	439	354	283	348	356

The deaths under the *respiratory class* may also be taken as a fair index of the insalubrity of the town. And here Greenock is exceeded only by Glasgow, the results being as follows :—

	RATE.				Average Rate.
	1856	1857	1858	1859	
	One in	One in	One in	One in	One in
Glasgow.....	249	253	209	273	246
Edinburgh.....	306	384	323	367	345
Dundee.....	398	414	340	455	401
Aberdeen.....	397	406	426	427	414
Paisley.....	426	451	395	443	428
Greenock.....	308	352	277	253	297
Leith.....	457	559	367	725	527
Perth.....	504	452	296	662	478

Nor is there a different result from diseases of the *digestive organs*, as may be seen from the following table :—

	RATE.				Average Rate.
	1856	1857	1858	1859	
	One in	One in	One in	One in	One in
Glasgow.....	438	395	458	469	440
Edinburgh.....	816	741	633	696	721
Dundee.....	549	414	547	703	553
Aberdeen.....	629	867	592	735	705
Paisley.....	497	354	399	469	429
Greenock.....	398	355	383	540	418
Leith.....	880	620	791	601	723
Perth.....	939	438	498	697	643

Previous to the returns of the Registrar-General, no reliable data can be found as to the mortality classified according to diseases or groups of diseases. The total mortality, however, as ascertained from the number of interments in the three burying-grounds of the town is available from 1843, when a register began to be kept by a Mr Teulon, under the sanction of the magistrates. From the following table it will be seen that Greenock was several times still lower in the sanitary scale than it has been since the new system of registration came into operation :—

Year.	Estimd. Pop	Deaths.	Rate.	
			One in	
1843	37,036	1006	36	Epidemic of Fever.
1844	37,086	777	47	
1845	37,136	873	42	
1846	37,186	1142	32	
1847	37,236	2285	16	
1848	37,286	1374	27	,, Cholera.
1849	37,336	2403	11	
1850	37,386	1197	31	
1851	37,436	872	42	
1852	37,486	1120	33	
1853	37,536	1286	29	
1854	37,586	1591	23	

What the rate of mortality may have been before 1843 it is difficult to determine. No tables of any kind appear to have been regularly kept, although

Weir in his History of Greenock calls attention in 1827 to the necessity of a proper register being begun by the kirk-sessions. There is fortunately, however, for my purpose, a letter in the *Greenock Advertiser* of January 21st, 1833, and from the pen of my late father-in-law, Mr Williamson, who there gives, along with some statistics of the cholera epidemic of the previous year (during which he held the honorary office of treasurer to the local Board of Health), some remarkable facts which he must have arrived at only after considerable research, and which show that, as far back as 1732, the mortality in Greenock was far in excess of what it should have been. But this will be more apparent from the following figures:

Year.	Estim'd. Pop.	Deaths.	Rate.	
				One in
1730	2,500	94	26	
1731	2,550	105	24	
1732	2,600	160	17	
1733	2,650	125	21	
1829	26,072	539	48	
1830	26,820	488	59	
1831	27,571	702	39	
1832	28,507	1097	25	Epidemic of Cholera.

It having been thus established that Greenock, in the matter of public health, stands at a lamentably low point in the sanitary scale, the question naturally arises, how has this been brought about? To this an answer must be sought for in two sets of causes—the PHYSICAL and the MORAL.

4. Taking the PHYSICAL, the first to be noticed is the

I. CLIMATE (1). And here the first point worthy of attention is the great preponderance of wet over fair weather, the number of rainy days far exceeding that of the other large towns, as may be seen from the following table, which applies to 1856-7-8-9:—

	1856	1857	1858	1859
Glasgow,.....	...	127	122	120
Edinburgh,.....	151	152	111	180
Aberdeen,.....	...	195	199	191
Greenock,.....	177	197	190	217
Perth,.....	155	163	138	153
Paisley,.....	...	...	...	190

(The blanks here arise from the returns not having been given in the Registrar-General's reports for these years.)

(2.) The RAIN-FALL likewise exceeds that of the other large towns, the amount for 1857-8-9 being as follows:—

	1856	1857	1858	1859
	Inches.	Inches.	Inches.	Inches.
Glasgow.....	...	2.80	3.85	1.06
Edinburgh.....	2.23	1.87	1.41	3.72
Aberdeen.....	...	2.29	2.16	2.27
Greenock.....	4.49	4.46	4.82	5.70
Perth.....	3.02	2.54	2.71	2.71
Paisley.....	...	...	...	4.44

In this respect, indeed, the rain-fall has reached in some months no less than 9 or 10 inches.

(3.) The BAROMETRIC RANGE is comparatively high. In 1859 it exceeded that of the other large towns, and showed the highest number presented during the three years ending in 1859; although, at the same time, it must be admitted that it was lower than what was noticed in Edinburgh in 1857, and in Edinburgh and Aberdeen in 1858.

	1856	1857	1858	1859
Glasgow,.....	...	1.176	1.234	1.162
Edinburgh,.....	1.185	1.315	1.307	1.290
Aberdeen,.....	...	1.182	1.322	1.250
Greenock,.....	1.221	1.247	1.275	1.343
Perth,.....	1.130	1.225	1.243	1.277
Paisley,.....	...	...	...	1.327

(4.) WINDS. The prevailing winds are the S.W. and E, the former of which is usually attended with wet weather; the next is the W, then the N.W., the S.E., the N.E., the S., and the N. As respects the number of days in which the wind blows in particular directions, Greenock exceeds the other large towns in so far as the E. and S.W. are concerned, while, as regards the S. and N., it is exceeded, on the other hand, by the others, its position, as regards the N.E., being superior to Perth, and as regards the W. to Aberdeen only. But this will be better seen from the following table, which gives the total results in this respect for 1857-8-9:—

	WINDY DAYS IN 1857-8-9.								Calm or Var.
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	
Glasgow...	39	141	161½	76	106	246½	193	88	28
Edinburgh.	54½	86½	147	50	81	232½	310½	76½	52½
Aberdeen..	50	58	29½	137	78½	254½	76½	169½	142½
Greenock..	16	50½	192½	105	38	334½	181½	110	74
Perth.....	38	41½	28	129½	51	170	191½	106	341

Then as to the MEAN PRESSURE, although not the highest, it is still considerably above the average:—

	LBS. ON THE SQUARE FOOT.			
	1856	1857	1858	1859
Glasgow,.....	...	3.52	4.57	3.27
Edinburgh.....	0.96	1.41	1.90	2.73
Aberdeen,...	...	1.70	2.02	2.24
Paisley,.....	...	...	...	0.08
Greenock,.....	2.92	2.57	2.51	2.70
Perth.....	0.91	0.45	0.64	0.30
Average.....	1.59	1.93	2.36	2.26

(5.) TEMPERATURE. While the average temperature, as derived from the mean monthly temperature extending over a period of four years, ending 1859, is 48.3, which is nearly equal to that of Edinburgh and Perth, and above that of Glasgow and Aberdeen, the average of the daily variations, on the other hand, is exceeded by that of the other large towns. This might appear favourable to Greenock, but it is far more than counterbalanced by the fact that the amount of moisture in the atmosphere is almost invariably greater than that existing in the other large

towns. In the months, accordingly, when the temperature is low, sudden transitions will be attended with more disastrous results than in the other

large towns. The actual state of matters, however, under this head, will be best seen in a comparison of the following tables :—

Table showing the Average of the Mean Temperature and Mean Daily Range in the different months of the four years ending Dec. 31, 1859.

	Glasgow.		Edinburgh.		Aberdeen.		Greenock.		Perth.		Paisley.	
	Mean Temp.	Mean Daily Range.	Mean Temp.	Mean Daily Range.	Mean Temp.	Mean Daily Range.	Mean Temp.	Mean Daily Range.	Mean Temp.	Mean Daily Range.	Mean Temp.	Mean Daily Range.
January	39.5	8.8	39.7	9.	37.4	12.4	39.	8.2	39.6	9.2		
February.....	39.1	9.7	40.6	9.6	37.1	8.6	39.9	8.9	40.8	9.3	42.	9.6
March.....	41.	9.9	42.3	10.2	39.	14.	41.3	10.3	43.1	11.8	43.8	11.1
April.....	43.7	13.9	44.7	12.8	51.4	13.5	44.7	13.2	45.7	14.1	42.7	13.4
May.....	51.	17.	50.9	14.1	47.1	15.1	50.7	15.6	50.5	14.4	51.6	22.4
June.....	57.6	16.3	58.2	15.	55.3	17.1	58.4	13.	59.4	18.2	55.9	16.2
July.....	57.4	13.8	59.6	15.1	57.	17.9	59.	12.4	60.8	10.1	58.2	14.8
August	58.6	15.3	60	13.8	56.8	16.5	59.9	13.8	59.7	17.3	57.6	13.7
September.....	53.8	13.4	55.7	12.6	52.7	13.6	55.	13.9	55.4	15.3	52.	14.3
October.....	48.1	10.9	49.5	10.3	45.9	13.5	49.	9.	48.3	13.	45.4	13.6
November.....	40.8	9.7	43.1	9.	39.8	12.7	42.7	7.7	41.8	10.2	39.7	10.4
December.....	40.4	8.6	41.5	8.3	37.7	11.9	41.	7.6	40.8	6.8	35.1	10.
General Average...	47.5	12.2	48.8	11.6	46.4	13.9	48.3	11.1	48.8	12.4	47.6	13.5

N.B.—The numbers under Paisley are those for 1859 merely—no record having been kept till that year.

Table showing the average weight of Vapour in every cubic foot of Air during the different months of the four years ending Dec. 31, 1859.

WEIGHT OF VAPOUR IN CUBIC FOOT OF AIR.						
1856-7-8-9.	Glasgow.	Edinburgh.	Aberdeen.	Greenock.	Perth.	Paisley.
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
January.....	2.43	2.36	2.27	2.44	2.	2.54
February.....	2.37	2.38	2.28	2.40	2.15	2.64
March.....	2.41	2.41	2.36	2.42	2.26	2.69
April.....	2.51	2.56	2.60	2.58	2.52	2.48
May.....	3.07	3.05	2.95	3.08	3.02	3.36
June.....	4.03	3.81	3.75	4.35	3.79	3.90
July.....	4.13	4.02	3.91	4.22	3.99	4.60
August.....	4.48	4.26	4.11	4.57	4.14	4.40
September.....	3.95	3.87	4.05	4.	3.68	3.54
October.....	3.06	3.26	3.25	3.34	3.95	2.96
November.....	2.50	2.62	2.63	2.66	2.21	2.36
December.....	2.59	2.50	2.64	2.61	2.17	2.02
General Average.	3.13	3.06	3.09	3.22	2.93	3.12

The numbers for Paisley apply only to 1859.

From a consideration of these facts it must be evident that persons employed at out door occupations will, in Greenock, be much more exposed to diseases arising from damp and cold, as well as changeable weather, than persons similarly occupied in any of the other large towns, and that young children will, for a very great portion of the year, be prevented from enjoying that out-door recreation so essential to health, and, in the case of the lower orders, be forced to be cooped up in houses already over-crowded, and but ill or not at all provided with the conveniences essential to the maintenance of common decency. Nor is this contradicted by experience, for it has been shown that in diseases of the respiratory organs, to mention no others, and more especially consumption, which is usually

included in the tubercular class, the mortality in Greenock is deplorably high. The disastrous effects of the east wind in the case of those predisposed to the last mentioned disease has been repeatedly pointed out by the Registrar-General. If this is true as a general deduction, need it be wondered that in Greenock the mortality from a scourge so terrible should be far in excess of the other large towns? It is not meant here that it is in the power of man to control the elements, but what has been shown clearly proves the necessity of individuals taking more than ordinary precaution against damp and cold, and of the constituted authorities doing everything they can to carry out those measures which will afterwards be brought before you.

II. SOIL. The soil of the level portion of the town

towards the shore is light, and mixed with sand and gravel. In the higher parts this is diversified with loam, clay, and till. Still farther up, the soil is for the most part thin, bare rocks appearing here and there. The rocks are chiefly the old red sandstone, with its conglomerate near the shore, and various kinds of trap, principally basalt and greenstone, throughout the hills. (Vide Fullerton's Imperial Gazetteer of Scotland.)

III. POSITION AND EXTENT OF THE TOWN.—The position of Greenock is low, its longitude being 4 deg. 45 min., and its latitude 55 deg 57 min. W. It lies facing the north, and on the borders of an extensive bay, and is bounded on the south and south-west by a range of hills which rise to a height varying from 300 to 800 feet, and sweep behind it in a semicircular form. In this way it is directly exposed to the virulence of the N. and E. winds (the effects of which have been already noted), and shut out from the genial influence of the S. and W. At present it may be said to occupy an area about $2\frac{1}{2}$ miles in length by $\frac{3}{4}$ ths of a mile in breadth. It may be said at the same time, to be divided into an upper and a lower portion, the latter being the area of the town till the beginning of this century, and the former representing its increase since that time. The old town occupies a space about a mile in length and 1500 feet at its widest portion, and 500 feet at its narrowest, in breadth. The westernmost half of this portion is closely built up to and hemmed in by a range of heights lower than those just referred to, and about 80 feet above the sea-level, while the whole of the other or newer portion is situated on what there is of plateau on the south of these heights, as well as on the slopes to the east and west of them. Generally speaking then, Greenock may be said to occupy a very confined space, and that this is true more especially of the older part of the town. Nor is this evil lessened by its

IV. MODE OF CONSTRUCTION, for when viewed from any of the elevated positions behind it, it looks as if the houses had been huddled together as closely and at the same time as irregularly as possible. They certainly could not have been planned with even the slightest regard to the free and uninterrupted circulation of pure air, and still less to the access of the direct rays of the sun. But when examined more closely this evil becomes more striking, for the streets are so narrow as to have in only a few instances a breadth of 40 feet, the great majority not exceeding 30 feet. And this is aggravated by the houses on each side of these streets having, as a general rule, back lands or houses, so that every street may really be considered as a double street, the back courts enclosed by these houses being so confined as scarcely ever to be penetrated by the direct rays of the sun. This holds equally true of very many of the cross lanes, the back courts of which cannot but be in a worse position than those belonging to the main thoroughfares. The old part of the town would thus appear to be an agglomeration of narrow, confined courts. As a general rule, moreover, the height of the houses is quite disproportionate to the width of the streets, the great majority of them rising three stories and not a few four and five, so that even although the breadth of the streets were greater, the vast proportion of those running from south to north would, for the greater part of the day, be in shadow. This does not apply to the

greater portion of the newer quarters of the town. There are, no doubt, to be found in those parts many places having back lands and presenting other conditions similar to those described, but for the most part the streets are wider, ranging from 40 to 60 feet. At the same time it is to be regretted that the width was not made still greater, particularly in the case of several of more recent formation, such as Hill Street, Antigua Street, Roxburgh Street, Wellington Street, Watt Street, &c., for there can be little doubt that as the houses depreciate they will be occupied in the course of time by a low class of tenants, and be so much subdivided as to become nothing better than over-crowded dens. Before such an audience as this the effect of this state of matters need not be pointed out, but when there is added the fact that at the Census of 1851, while the number of inhabited houses was in Edinburgh, Aberdeen, Dundee, Paisley and Perth in the proportion respectively of 1 to 20, 12, 15, 17, and 11 of the population, it was in Greenock in the proportion of 1 to 21, being in this respect superior only to Glasgow, which had the proportion of 1 to 26—the wonder will be that the town does not occupy a position even lower than that which it has hitherto presented.

V. Then as to the CAUSEWAYING OF THE STREETS, there are many defects in the old as well as in the new portion of the town. In the former, although it has been considerably improved within the last few years, it is upon the whole but ill constructed and not calculated so as to allow of the ready escape of fluids into the surface drains. This is more especially true of the courts and bye-lanes already referred to. In the new parts of the town, again, the greater proportion of the streets are macadamized, but these, from the great amount of rain-fall, are for the greater part of the year perfect puddles. The foot paths, too, are for the most part unpaved, so that the surface water is sure to sink close to the foundations of the houses and tend to keep the low floors damp and disagreeable. Indeed the whole state of matters in this respect can be attended with no other result than an aggravation, or at all events a perpetuation of the discomforts arising from a predominance of rainy weather, as has been already shown to obtain to a great extent in Greenock. Soft roads may suffice in an open country, but in a closely peopled district they are sure to keep up the damp condition of the atmosphere.

VI. To come next to the STATE OF THE HOUSES, many of these, it must be noticed, are, from decay, confined position, want of drainage, ventilation, and light, utterly unfit for human habitation. In the old parts of the town they are almost entirely without conveniences, either within or without, so that there is usually an accumulation of filth within the houses themselves, or in the courts or closes in which they may be situated. Many of the common stairs are provided with what are called *jaw boxes*, but these, from being unsupplied with water, only maintain instead of abating the pollutions already existing. As to accommodation for washing purposes there is in the old parts of the town literally none in the shape of public or private washing greens, so that the poorer classes, if at all disposed to cleanliness, must have their clothes not only washed but also dried within doors; the effect of which in houses otherwise uncomfortable can only

be appreciated by those who have actually witnessed it. While saying this, however, it is right to state that the houses recently erected in the newer portions of the town are, upon the whole, of a much improved description. In the West, the self-contained houses are palatial in their style, while in the east and upper parts, those for the middle and working classes are supplied with excellent conveniences in the way of washing-greens, baths and water-closets. In the latter class, unfortunately, as well as in many of the houses now being built, a form of convenience prevails which cannot be too strongly condemned—viz., *concealed beds*. Into boxes such as these whole families are often packed during the night, and without any means being taken for the admission of fresh air, or the removal of the noxious gases which are gradually accumulating from the united breaths of the sleepers. The influence of this on the tender constitutions of the young more especially must be something really frightful. In certain parts of the town, moreover, where the ground slopes downward from the line of streets, there are to be found feuars who fit up as dwelling-houses sunk stories, which, they must be aware, are in consequence of the damp fit for nothing but cellarage. On this might be based an argument for the necessity of a Guild Court such as will be afterwards referred to, or for an inspection of houses by a competent authority before any portion of them is allowed to be let.

VII. As to WATER SUPPLY, this, it must be admitted, has for the last 30 years been ample, and almost always of good quality. From its mode of distribution, however, and from its being to all intents and purposes in the hands of a private company, there is not derived from it that amount of benefit which one would desire, and would, moreover, naturally expect in a place on which the rains of heaven are so bountifully poured. The exact mode of supply and some of its disadvantages will be detailed by and by. In the meantime suffice it to say that although almost all the feuars in the newer parts of the town, and many in the older, have taken advantage of the supply by leading water into their houses, and although there is for the poor in all parts of the town abundance and free of charge, there is for the latter, generally speaking, little inducement to cleanliness, in consequence of their being forced to travel to the public wells for all the water they use, and because of the authorities having no power to compel the feuars to lead water into their respective properties.

VIII. With reference to DRAINAGE it may be said that till within the last few years there was nothing like a proper system of main sewers. Many streets were entirely without drains, and others had them so imperfect as to prove worse than useless—in fact unmitigated nuisances—and even although there were tolerable drains in certain streets, they were in many instances not taken advantage of by the feuars, filthy fluids being allowed to escape on to the streets, and in dry weather to lie in stagnant pools or puddles, or to flow sluggishly in ill-constructed surface gutters. So far as courts and alleys were concerned, this was almost invariably the case. But not only were the main drains imperfect—they were allowed to discharge themselves into the harbours, the bottom of which, on ebb tide, presented a foul, slimy mud, from which at all times, but more

especially during hot weather, the stench was horrible and overpowering, its influence being felt for a considerable space in the lower and most crowded portions of the old quarters of the town.

IX. As closely connected with this may next be mentioned certain NUISANCES of a most deleterious character. The chief of these was a great receptacle for the drainage from a considerable portion of the town, viz., the *West Burn*, a small stream which, taking its origin in the Inverkip Valley, passes in an irregular course between the middle and the western or newest portion of Greenock, and finally discharges itself into the Clyde at a point to the west of the Old West Quay. This burn has generally in winter and occasionally in summer a considerable flow of water, but most usually in summer is dry and stagnant in its upper half and sluggish in its lower. It is exposed throughout its whole course, except where covered by three or four narrow bridges; and has an average breadth of 15 to 20 feet, the ground on each side of it passing off in an irregularly sloping direction for the upper half, and houses being built with their foundations sunk in its bottom for at least two-thirds of its extent. In connection with it also is a mill dam or reservoir, which stands about its middle, and occupies an area of about $\frac{3}{4}$ ths of an acre. It is supplied with the water coming from the uppermost part of the burn, and is, towards the east, bounded by the foundation of a row of houses, from the windows of which the tenants directly throw their refuse and abominations into it; so much so that it has been frequently called a gigantic cesspool. The same is done by the occupants of many of the houses bordering on the burn itself, which is at its origin pure, but as it runs towards the sea receives from a great variety of sources such an amount of impurities as to be constantly throwing off the most foul and sickening effluvia, which can be felt for a considerable space in the surrounding district. For persons who have not actually seen the nuisance it is difficult to get anything like an adequate idea of it. A faint one, however, may be formed from the fact that I frequently sailed up and down the Thames from London to Westminster Bridge at a time when the great leader of public opinion was thundering into the ears of the legislature the paramount necessity of doing something to abate the fouling of that great river, and I never experienced one tithe of the discomfort which I have felt when passing along the bridges over the burn. But if this will not suffice, perhaps a better conception will be obtained from the following extract from a letter which I inserted in the *Greenock Telegraph* newspaper, on May 9, 1857:—*

"I find that there have been received into the fever wards no less than 486 patients; about 30 of these, however, were not cases of fever, so that the number of fever patients is reduced to about 450. The number, notwithstanding, is a very large one, and much greater than that admitted during any of the years succeeding the great epidemic of 1847-8. In that epidemic Inverkip Street was found to have been one of the greatest hot-beds of fever in Greenock, and that result is, I am sorry to say, more than confirmed by the statistics of the passing epidemic. While Dalrymple Street has sent 19 cases, Shaw Street 7, Mar-

*I happened to have been engaged at that time in making up the Statistical Report of the Infirmary.

ket Street 29, Inverkip Street has sent no fewer than 37. The High and Low Vennel have together sent 42, and this may be looked upon by some as favourable to Inverkip Street. But the balance is more apparent than real, for the High and Low Vennel are nearly double the length of Inverkip Street, and are actually *double streets*, in consequence of almost every land having one to correspond with it behind. The whole of Port-Glasgow even stands in marked contrast with this single street, for it has supplied only 24 patients. There has, no doubt, been comparatively little fever in that town during the last twelve months. The epidemic appears to have done its work there during the year ending 30th April, 1856, for in that year 76 fever patients were admitted from Port-Glasgow. But this number, though double that presented by Inverkip Street, places the neighbouring town in a contrast most unfavourable to the latter locality. So far, then, as zymotic disease is concerned, *Inverkip Street is the most unhealthy street in Greenock*. The fact is lamentable, but there it is. And why should it be so? Comparatively with other streets in the heart of the town, Inverkip Street is most favourably situated as regards position, houses and inhabitants. It forms an incline admirably adapted for getting rid of surface drainage, and is swept by breezes which rush down with considerable force from the Inverkip Glen. It is not closely hemmed in by other streets, nor closely built upon. About one-half of the east side is free of dwelling-houses. The houses are upon the whole much superior to those existing in streets supplying a smaller number of fever cases, are occupied by cleanly and respectable people, and are, moreover, with few exceptions, without the disadvantage of back lands. Whence, then, such an amount of preventible disease? Clearly and indisputably, the West Burn and the Mill-dam. The olfactory nerves of the most obtuse passer-by cannot but detect at once the source of the poison, and the eye of the most unreflecting be offended at the sight of the corruption which meets him at every turn. The very thought of it is enough to make the heart sick. But how will your readers feel when I enumerate in their order the noxious matters which find their way into the West Burn? First of all there is the drainage from the Poor-House, Black's Brewery, Brown's Sugarhouse, the stinking cabbage garden on the south side of Roxburgh Street, and the houses on the west end of Roxburgh Street, Mount Pleasant, Orangefield, and Bruce Street; then there is the drainage from the Cemetery, Ferguson's Sugarhouse, the houses on both sides of Inverkip Street, the Infirmary, and the Inverkip Street Burying-ground; and lastly, there is the drainage from the houses on both sides of West Burn Street, beginning at the High West Bridge and ending at Dalrymple Street. Why, the drainage from the burying-ground alone is sufficient to breed a pestilence. But here I may be looked upon as overstating the case. To show, however, that I am not going beyond the bounds of probability, I would call the attention of those inclined to dispute my position to the following history:—In the year 1847 I happened to be house surgeon to the Infirmary. At that time the town was ravaged by a severe epidemic of fever, which advanced with such rapidity as to render an auxiliary hospital imperatively necessary. For this purpose the building now known as the "Cholera Hospital" was procured. The old house, notwithstanding, became *tainted*, and to such a degree that the surgeons were afraid to operate in consequence of almost every sore taking on an unhealthy action. In the fever wards erysipelas appeared either during the progress of, or during the convalescence from typhus. A simple blister could scarcely be applied without this troublesome complication manifesting itself. At the expiry of the year *nearly seventy cases* were found to have been afflicted with it. In the auxiliary hospital, on the other hand, though equally crowded, there was no tendency to this affection; and what is still more remarkable, the Infirmary

itself, though fully occupied during the great epidemic of 1843-4, kept free at that time from accidental contamination. Here, then, was a striking difference, and one calling for investigation. I suspected the cause, and directed the attention of the Secretary to it. It was nothing less than the *drainage from the burying-ground*. It so happens, that the surface level of the burying-ground is several feet above that of the Infirmary Court, and, in the year referred to, it turned out when wet weather set in, that foul water gushed out from below the burying-ground wall, and found its way into the sunk flat of the Infirmary, where it occasioned such a stench as frequently to drive me from the room I then occupied. The remedy was of course evident. A drain was formed along the north wall of the burying-ground and connected with the main drain of the Infirmary. Its effect was decided, rapid, and permanent,—hospital sore and endemic erysipelas disappeared, and the house has ever since remained healthy. Here comment is unnecessary. But what, it may be asked, becomes now of all the putrid water which must be constantly issuing from the burying-ground? It passes on, as I have already stated, to the West Burn and the Mill-dam, where it never ceases, day or night, to boil and bubble, while generating those gases which with unerring certainty carry disease and death in their train. But the blighting influence does not stop here, for the burn, before it reaches the river, has to pass a length of street greater than that of Inverkip Street. In that course its impurity is constantly increasing, and there can be no doubt that its noxious qualities are in no way diminished. At the present moment typhus is actually spreading in the tenements bordering on the burn and adjoining the bridge passing over Dalrymple Street."

The greatest nuisances, however, were or are those in immediate proximity to inhabited houses, such as ash-pits in crowded courts, and accumulations of filth where these do not exist. Extensive collections of pig styes existed, likewise, till a very recent date, in close connection with some very old houses occupied by a poor class of tenants. One of the most glaring instances of this was a collection which stood on an area of about 100 yards by 20, and behind houses on a line of street (Main Street) which, in the Infirmary reports, has always been noted for its unhealthiness. Closely allied to this may also be mentioned the shambles which are connected with the Flesh Market, and immediately behind a street (Market Street) which has also been remarkable as a hot bed of fever and other infectious diseases. Then, in one quarter of the town was a burying-ground, the state of which was so horrible as to defy description, and such as to lead the Home Secretary, after the usual process before the Sheriff, to issue, about two years ago, an order for its closure. Two others still exist in another part of the town. For reasons which will be afterwards assigned, it is to be hoped that they also will meet with a similar fate.

As to nuisances from public works, they are fortunately not numerous; at all events, not of a very disagreeable character. A very few chemical works only come under the latter description. At the same time, their influence is spread over an extensive area, particularly in certain directions of the wind, as urgently to require abatement. Next to these in offensiveness, are the effluvia from the re-burning of animal charcoal in sugar refineries, of which there is a considerable number in Greenock, and not a few of which are in immediate proximity to inhabited houses. From these, too, as well as from iron foundries and other works, there is an

almost constant discharge of vast quantities of smoke, which hangs usually in a heavy canopy over the middle and easternmost parts of the town. Finally, the system of street cleansing is very imperfect, and usually executed in a slovenly manner. In the narrow lanes, more especially, there is no small difficulty in keeping them clean, in consequence of many parties, when not under the eye of the police, and because of the want of proper conveniences, throwing out, at all times, filth of every description, which, in hot weather, cannot but contaminate the atmosphere to a very great degree. The surface drains are thus, as has been already mentioned, usually stagnant and filthy. The sweeping of the causeway, too, from want of previous watering to lay the dust, is, in dry weather, attended with far more harm than good, it being no rare thing for the passers-by to be almost blinded by the clouds of impurities thrown up by the besom of the scavenger.

From the foregoing sketch, most of those who now hear me will be at no loss to account for much of the mortality which has hitherto characterised the town, and they will not be astonished to learn that when contagious or infectious diseases assume an epidemic form, they commit ravages almost without a parallel. From a very early period, typhus or continued fever, in some one or other of its shapes, appears to have exercised a most malignant influence. Indeed, it was owing to the ravages frequently made by fever, and more especially by a typhus said to have been introduced by some Russian sailors in 1806, that the present Infirmary was instituted; and, since its opening in 1809, it has, notwithstanding successive additions, been found in three epidemics, quite insufficient for the demands made on it by the victims of this disease alone, auxiliary buildings having been rendered necessary in 1829, 1844, and 1847, on which occasions there were accommodated 437, 2204, and 1630 respectively. But what concerns us most to know at present, is the

fact that the records of the institution clearly and invariably point to the crowded and filthy portions of the town as the great hot beds of this disease. As far back as 1814 the Directors are found calling attention to certain lanes and streets which have since lost but little or nothing of the character then given them, the words of the report being as follow:—"In noticing the increase of fevers during the last year, your Committee feel it their imperious duty to state that all the cases admitted into the Hospital have been traced to contagion in three of the narrow lanes in town—Market Street, Tanwork or Harvie Lane, and the Long Vennel. The Market Street has afforded most instances, particularly from Scott's Land. These places are inhabited chiefly by the lowest classes of the community; were they as remarkable for their attention, as they are for their inattention, to cleanliness, it is doubtful whether, left to their own exertions, they could purify some of these. The area or close of Scott's Land is a reservoir of liquid filth, while the Tanwork and Dirty Close are names for the same place." Nor are the facts brought out in subsequent reports less conclusive on this point. In a table prepared by Mr Adam Fairrie of Liverpool, who was at one time Provost of the burgh, and long treasurer of the Hospital, and whose many good deeds are still held in grateful remembrance by the community, it is demonstrated that during the twenty years which he brought into requisition, the streets from which the greatest number of fever cases was sent to the Hospital were those similar to those just mentioned, and chiefly in the old parts of the town already described. Taking the next great epidemic—1847-8—a like result is shown, which is, moreover, not contradicted by the year which presented the greatest number of cases since that time, viz., 1857, the three epidemics of cholera, 1832, 1849, and 1854, presenting results almost identical. But this will be best appreciated by the following table:—

STREETS, &c.	Fever Admissions into Hospital—1824-43.	Fever Admissions into Hosp.—Epidemic 1844	Fever Admissions into Hosp.—Epidemic 1847	Fever Admissions into Hosp.—Epidemic 1857	Cases of Cholera in Town—1832.	Cases of Cholera in Town—1849.	Cases of Cholera in Town—1854.
Anchor Inn, (with Shannon and Longwell Closes) ^a ...	70	14	6	..	1	5	...
Ann Street	38	19	17	4	11	18	1
Ardgowan St, Glebe .....	...	...	...	5	...	...	1
Arthur Street .....	...	...	1	2	...	8	1
Baker Street .....	...	...	4	...	...	1	3
Bearhope St., (with Duncan and Roxburgh Street)	41	15	1	...	2	3	...
Bell Entry .....	...	...	3	...	...	6	...
Blackhall St, East .....	...	...	...	...	...	3	...
Do. West, (with W. Stewart St)	25	8	1	1	16	2	...
Carry forward	174	56	33	12	30	46	6
STREETS, &c.	Fever Admissions into Hospital—1824-43.	Fever Admissions into Hosp.—Epidemic 1844	Fever Admissions into Hosp.—Epidemic 1847	Fever Admissions into Hosp.—Epidemic 1857	Cases of Cholera in Town—1832.	Cases of Cholera in Town—1849.	Cases of Cholera in Town—1854.
Brought forward	174	56	33	12	30	46	6
Breast, East .....	...	...	1	...	...	3	...
Do, Mid .....	...	...	1	1	...	4	...
Do, West .....	...	...	7	1	...	6	1
Broad Close	31	21	16	...	2	11	2
Brougham Street .....	...	...	1	...	...	...	...
Bruce Street .....	...	...	7	2	...	3	...
Buccleuch Street .....	...	...	12	2	3	3	...
Buchanan's Close .....	...	...	...	5	5	5	...
Candlehouse Close .....	...	...	...	...	3	...	...
Captain Street .....	...	...	...	...	...	1	...
Cartsburn Street .....	...	...	14	2	2	8	4
Cartsdyke ^b	616	301	...	...	69	...	...
Do, to Rue-end	53	31	...	...	...	...	...
Carry forward	874	409	92	25	114	90	13

^a When one street is combined in this way with another, the union is to be held as referring to the two first columns only, Mr Fairrie having taken some streets in certain quarters together.

^b All the streets in the Cartsburn Estate are here included in Cartsdyke, those contributing to the total result being chiefly, if not entirely, Main Street and Stanners Street.

STREETS, &c.	Fever Admissions into Hospital—1824-43.	Fever Admissions into Hosp.—Epidemic 1844	Fever Admissions into Hosp.—Epidemic 1847	Fever Admissions into Hosp.—Epidemic 1857	Cases of Cholera in Town—1832.	Cases of Cholera in Town—1849.	Cases of Cholera in Town—1854.
<i>Brought forward, ...</i>	874	409	92	25	114	90	13
Cathcart Street...	62	25	16	5	8	20	1
Charles Street...	111	36	36	15	16	26	4
Clarence St., Glebe...	...	...	...	1	1	...	...
Cowdenknowes...	...	...	...	...	2	...	...
Cowgate Street, (with Buccleuch Street)	127	57	22	8	10	10	1
Crawford Street...	...	...	9	1	2	4	1
Cross-shore Street...	30	19	5	1	4	9	5
Dalrymple Street...	...	...	50	21	53	29	10
Dellingburn Street...	...	...	...	...	1	1	...
Dock Entry...	92	64	36	4	1	9	2
Duncan Street...	...	...	1	4	4	1	1
Drumfrochar Road...	...	...	6	3	...	1	...
Drummer's Close (with Minister's Cl.)	33	18	46	9	5	16	6
East Quay Lane,	53	15	17	3	4	8	3
Fox Lane...	...	...	...	...	...	5	2
Glebe...	61	16	...	...	...	3	...
Gourock Rd, High } Do, Low...	49	5	1	1	2	...	...
Grey Place...	...	...	...	...	...	1	...
Hamilton Street...	130	19	37	12	11	38	4
Harvie Lane...	97	38	47	13	16	14	1
Henry Bell Close...	...	...	4	...	...	...	...
Highland Close...	51	29	63	3	7	31	1
Hill Street...	...	...	...	1	...	...	...
House of Refuge...	...	...	...	...	...	10	...
Infirmery, Nurses...	25	20	8	2	...	...	...
Do. Patients...	...	...	10	...	...	...	...
Ingleston Street...	...	...	...	...	...	3	1
Inverkip Street...	147	46	44	37	10	18	2
Kelly Street...	...	...	...	2	...	...	...
Kilblain Street...	12	2	4	1	...	1	...
Kirk Street...	...	...	...	...	1	...	...
Longwell Close...	...	...	20	10	11	13	1
Lyle Street...	...	...	...	1	...	...	1
Lynedoch Street...	...	...	...	...	...	2	...
Main Street...	...	...	38	12	2	97	15
Manse Lane...	61	18	29	21	7	8	2
Market Street...	382	128	68	31	33	51	12
Minister's Close...	...	...	2	...	...	...	...
Nelson Street, Glebe...	...	...	2	1	...	2	...
Nicholson Street...	20	6	4	3	5	8	...
Open Shore...	...	...	...	1	...	8	...
Overton, (with Neighbourhood)...	14	7	1	...	...	11	...
Patrick Street...	...	...	1	...	...	...	...
<i>Carry forward.....</i>	2431	977	720	252	330	548	89
STREETS, &c.	Fever Admissions into Hospital—1824-43.	Fever Admissions into Hosp.—Epidemic 1844	Fever Admissions into Hosp.—Epidemic 1847	Fever Admissions into Hosp.—Epidemic 1857	Cases of Cholera in Town—1832.	Cases of Cholera in Town—1849.	Cases of Cholera in Town—1854.
<i>Brought forward.....</i>	2431	977	720	252	330	548	89
Poor House c.....	...	...	4	16	...	...	...
Port-Glasgow Road	21	9	6	...	...	17	2
Princes' Street...	...	...	11	...	...	...	...
Prison.....	12	4	...	1	1	...	1
Quarantine Hospital	...	...	...	...	2	...	...
Ragged School...	...	...	...	1	...	...	...
Regent Street...	8	2	1	...	2	1	1
Ropework House	...	...	4	...	...	...	2
Do. Lane, (with Kirk Street)...	20	...	5	...	...	5	...
Roslin Street, Glebe	...	...	5	11	...	...	...
Roxburgh Street...	...	...	...	2	...	12	...
Rue-end Street...	...	...	6	...	...	10	...
Sailors' Home...	...	...	...	3	...	...	...
St Andrew's Square	...	...	2	1	...	3	...
St John Street...	...	...	4	...	...	9	3
St Lawrence Street	...	...	...	2	...	2	5
Salmon Street...	...	...	...	...	...	6	...
Sir Michael Street...	58	8	14	2	5	18	...
Shannon's Close	...	...	2	8	...	3	...
Shaw Street, (with Dalrymple Street)	532	282	34	7	3	31	2
Shaw Street, East...	36	30	9	14	24	17	...
Shearer's Close...	...	...	10	3	1	7	1
Smith's Lane...	48	30	13	6	13	6	...
Split Close...	47	18	42	...	6	16	...
Springkell Street...	...	...	...	1	...	...	...
Stanners Street...	...	...	58	9	1	20	4
Sugarhouse Lane...	65	14	23	7	2	19	5
Taylor's Close...	328	307	110	14	42	31	2
Tobago Street...	47	8	19	7	9	15	1
Trafalgar Street	...	...	1	...	...	...	1
Under and Upper Crescent.....	...	...	...	...	...	19	3
Union Court.....	...	...	...	...	...	3	1
Vennel, High.....	532	203	118	45	81	36	...
Do, Low.....	...	...	65	...	50	12	...
Vessels in Harbours	...	...	6	6	8	6	3
Watson's Lane...	73	25	17	14	12	11	1
Watt Street...	...	...	...	2	...	1	...
Wellington Court	...	...	...	6	...	...	...
West Burn Street...	34	16	11	4	11	4	2
West Quay Lane...	28	14	...	...	2	3	...
West Stewart Street	...	...	...	...	1	1	...
William Street...	68	31	22	...	1	9	...
Strangers and Unascertained.....	717	226	288	42	340	25	...
<i>Total.....</i>	5105	2204	1630	486	897	964	141

^c This is an exception which proves the rule. The most degraded of the community being admitted into the house sometimes, carry, notwithstanding every precaution, the elements of infection along with them. On the slightest manifestation or even suspicion of this, however, the patients are at once transferred to the Infirmary. A rigid observance of this rule has kept the Institution, during times of epidemics, almost entirely unscathed. Of the 16 cases, it is right to state that 6 were not cases of fever.

N.B.—The results of the Epidemic of 1832 have been obtained from a careful perusal of a file of the *Greenock Advertiser*, which published daily lists of the seizures, but apparently not with uniform correctness.

To show the expense caused by this large amount of preventible disease, it has only to be stated that since the institution of the Infirmary till the present time, there have been treated no fewer than 12,360 cases of fever, the average cost of which, calculating from the data furnished me, has been exactly L.2

2s 6d per patient, and that, moreover, exclusive of the sums paid in the way of building and purchase of ground, the proportion of which, for this department of the Hospital, may be estimated about L.5000. Accordingly, for the treatment of those afflicted with this disease alone, it may be said, in

round numbers, that the subscribers to the Infirmary have paid in 50 years no less than L.31,000. If to this be added the expense entailed on the community by the three epidemics of cholera in 1832, 1849, and 1854, in which years there were affected 897, 964, and 141 respectively—in all, 2002—there will be obtained a sum of about L.35,000, the annual interest of which, if properly and regularly laid out, would long ere this, not to speak of the preventing of the desolation of many a happy home, have saved the rate-payers much of the difficulty which they will soon have to encounter. But this sum, large as it is, must be far below the reality, as there is excluded from the calculation the number of fever patients who did not come under the eye of the Hospital authorities, as well as the widows and orphans whose maintenance, from this cause alone, fell from time to time upon the Parochial Board.

Having thus shown the actual condition of the town as respects matters affecting the general health of the community, the question now arises, How has this been brought about, and what steps have been taken in the way of prevention or remedy? And here, in the first place, it will be necessary to show how the *overcrowding* originated. This, for various reasons, will be interesting and instructive. It has to be stated then, at the outset, that the ground on which the Parliamentary Burgh now stands is made up of portions of two entailed estates which are at present in the possession of Thomas Crawford, Esq., of Cartsburn, and Sir Michael Robt. Shaw Stewart, Bart., M.P. for the county of Renfrew. Though now included under the one name of Greenock, the former is called Crawfordsdyke or Cartsdye, while the latter may be styled Greenock proper. About 200 years ago, to go no further back, the present Greenock was represented by Crawfordsdyke, which was erected into a burgh of barony in 1669, and consisted of a single row of houses facing the bay, and inhabited, according to Crawford, the historian of Renfrewshire, by "seamen and mechanicks." At that time Greenock proper presented only a straggling hut here and there, the first feu having been granted in 1636, at the foot of what has since been called the Tanwork Close or Harvie Lane. At the beginning of the 18th century, Greenock and Crawfordsdyke presented a population of about 1000 souls. At this time Greenock proper consisted of two rows of houses, both facing the shore, one being at the east (from East Quay Lane to Rue-end), and the other at the west end of what has been called old Greenock (from the Bell Entry to the West Kirk Yard), and also of a few which stretched up what has since been called the Vennel and Taylor's Close. In 1755 the population reached 3 500, and then the Town Council (Greenock having been erected four years previously into a burgh of barony by Sir John Schaw, the then superior) are found naming the new streets which had started up since the beginning of the century. These are what are now known as the main thoroughfares of the old part of the town, the whole streets in addition to those already mentioned being at that time Cathcart Street, Hamilton Street, Market Street, Dalrymple Street, Cross-shore Street, and William Street. After this the town increased rapidly, the population in 1791 having risen to 15,000, in 1801 to 17,458, in 1811 to 19,042, in 1821 to 22,088, in 1831 to about 27,600, in 1841 to upwards of 36,000, and in 1851 to about 37,500.

From this it will be seen that the town, in the latter half of last century, nearly quintupled its population, and in the next half century more than doubled the numbers of 1801. Such an increase as this never entered, it is to be presumed, into the mind of Sir John Schaw, although, in granting the charter of 1751, he strongly urged on the magistrates the propriety of using every means in their power to extend their harbours and increase their commerce. Be that, however, as it may, the increase during the decade immediately preceding the census of 1801 appears to have exceeded the expectations and preparations even of the inhabitants themselves, for, among other memorabilia appended to Weir's History of Greenock, it is stated that in 1802 the population increased so rapidly that, "notwithstanding the many new buildings, many poor families could not procure houses at this term, and were obliged to take up their abode in barns and out-houses." This could not have arisen from any obstruction on the part of the superiors, for there was always additional ground to be had for feuing purposes and at moderate rates. The old feus, however, having been granted without any restrictions as to the class of houses to be built on them, or prohibitions as to back houses or "lands," the feuars built as they thought proper, placing, it may be, a large public work in the very centre of a closely-peopled district, and from pure greed filling up every available inch of ground that might exist behind the houses, originally on the line of streets, with erections for the most part of an inferior description. This style of building, moreover, must have been carried on to a very great extent till about 1809 or 1810, when feuing was commenced on the plateau already described (now Regent Street, &c.) as resting on the lower range of heights close on the centre of the old part of the town. It is true that in 1791 certain restrictions began to be imposed on the feuars on the Greenock estate, and in particular, "that it shall not be competent for the vassal to erect a play-house, church of relief, house for a concert of musick or interlude, tanwork, soap or candlework, glass or bottlework, or any other kind of nuisance whatever, without the consent of the superior first had and obtained for so doing." But it is quite plain that the last clause, from the change of superiors and agents, and in the absence of any court exercising a control over the style of buildings, width of streets and the like, would, in the long run, enable the feuars to do as they pleased. At all events, the feu contracts did not prohibit the erection of back tenements. It simply excluded a certain class of buildings or works rather indiscriminately, but amusingly characterised as "nuisances." Be that as it may, this much is certain, that till 1818 there was no "regular" feuing plan of the town. Till 1796 there was no plan at all, and after that date any plans that were drawn out embraced only certain sections of the town. These, from their limited character, were anything but perfect. The plan of 1818, however, which was prepared by a Mr Reid, has since been taken by the superiors of both the Greenock and Cartsburn estates as a guide in the further extension of the town. Although not quite up to the requirements of the present day as regards width of streets, &c., it has effected a vast improvement on the old state of things. At the same time, it is to be regretted that till a comparatively recent period

the feus were granted without any qualifications as to the area to be built on, and the houses to be erected. Even yet there are found proprietors of old feus whose cupidity leads them to trample under foot the remonstrances of sanitary experience, and to continue to make an unrighteous profit by setting at naught every consideration affecting the health of their tenants. If it be alleged that this is bearing too strongly on the feuars, it has only to be mentioned that the feus whose condition is as above described are on the Greenock estate, held on an annual duty varying from 5d to 1s 8d per fall (36 square yards), and on the Cartburn estate on a duty merely nominal, in most cases, at all events, under 6d per fall—the rate of feuing in the former averaging at present 5s 6d per fall, or 6s 7d per pole, and in the latter varying from 2s to 6s 6d per pole. But while the superiors are in this respect blameless, it is to be regretted that they have allowed not a few of the new streets to be constructed according to Reid's plan, for being so narrow, they are sure, when wholly built on, to become filthy, dingy, and unhealthy lanes. This is more especially true of the Greenock estate. In both estates, moreover, there is a risk of the recent injunctions against overbuilding being violated in the course of time by greedy feuars, as has evidently been the case with the restrictions of 1791, and in consequence, as has been already said, of the want of a proper court of control. Be that as it may, it is to be hoped that the superiors will yet, in the unfenced portions of their estates, lay off streets according to some plan more in conformity with the ideas of the age than the one which has been followed since 1818. For streets likely to be taken up with houses for the working classes this is more especially necessary. If carried out, it would not fail to be attended with the happiest results, and entitle its authors to the lasting gratitude of the inhabitants.

Having thus shown how the over-crowding originated and has since been maintained, it remains for me now to point out the powers which the constituted authorities have had for improving the sanitary condition of the town, as well as the mode in which they have attempted to carry them out, and what is still necessary for them to do.

Generally speaking, nothing in the way of *prevention* was attempted till within the last 15 years. At a comparatively early period, indeed, the Reports of the Infirmary show that a Board of Health was established, very probably about 1813. This Board was composed of medical men in connection with that institution, and associated with a few public-spirited gentlemen who appear to have been interested in this matter. The efforts of this body, however, would seem to have been directed more to the early removal to the hospital of persons labouring under fever, as well as the cleansing of the houses of the affected by washing with lime, &c., than to the adopting of measures for effectually preventing the chief causes of the recurrence of the disease. At the same time, it is to be presumed that they accomplished a vast amount of good. How long the Board lasted, however, nothing is to be learned from the Reports referred to. During the great epidemic of cholera, again, in 1832, another Board existed and with functions similar to those exercised by the one just mentioned. This body expired shortly after that epidemic, but most probably not

without a knowledge of the defects of the Acts for cleansing and paving the town, &c., all of which had been passed in the reign of George III. By the first of these, which was obtained in 1773, a body of Trustees, consisting of the Bailies, Town Council, and a certain number of feuars was appointed, with powers to purchase springs or fountains within a distance of three miles of the town, and to construct reservoirs and lead water into the town for the use of the inhabitants, as well as to make bye laws for the paving, cleansing, lighting, and watching of the streets—the expense of carrying out the Act to be defrayed by an annual tax not exceeding 6d in the pound of actual rental of the houses and other subjects possessed by the inhabitants. From there being nothing specified as to how the paving, &c., were to be executed, it is not unreasonable to suppose that the Trustees, who were composed in a great measure of feuars, would do as little as possible, or have considerable difficulty in working the Act. And this would appear from the Act of 1801, which says that it would “tend greatly to the comfort of the inhabitants if a foot-way or pavement was made along each side of the streets, and regulations made for keeping clean and in repair the said streets and pavements.” Be that as it may, the Trustees, who had exhausted their borrowing powers, which were to the amount of £1500, secured on the rates, obtained authority to raise the rates to 1s per pound rental, to borrow to the extent of £10,000 for the purposes of the Act, and to purchase springs within *six* miles of the town; it being enacted at the same time, first, that the feuars on uncausewayed lanes or streets should be obliged to level and causeway to the extent of one-half of the said streets nearest to their respective properties, as well as to make pavements or foot-paths with flat hewn stones (dressed whin being only allowed when the ground was not built upon, and only till built upon); and second, that the repairs of the causeway and foot-paths should be afterwards kept up by the Trustees—provisions these, which if stringently acted on could not fail to be of great advantage to the community at large, but which, as will be noticed when speaking of the Act of 1840, would really appear to have been disregarded by a considerable number of the feuars. It was likewise enacted that persons laying down filth or dung on any part of the public streets should remove the same before a certain hour of the day, from which, in the absence of any specified provision, it would appear that the scavenging must have depended very much on the energy of the individual householders. By this Act, too, the Bailies and Council were authorized to make common sewers, drains and water-courses, the expense of which was to be defrayed out of the funds raised by the Act. This was evidently a great step in advance. At the same time, though it was provided that drains, &c., should be constructed, there is reason to believe from its being required that the tops of the coverings should be “at least 12 inches below the surface,” as well as from the absence of any power to compel feuars to lead tributary drains into the main sewers, that these must have been very imperfect and not attended with the benefits evidently expected by the framers of the Act. It is not to be wondered at, therefore, that the Directors of the Infirmary should have occasion in 1814 to remark on the filthy state of certain parts of the town, nor that a Board

of Health should be required for the purpose of cleansing the foul closes and houses when fever was raging. The wonder rather is that with powers so inadequate, and with a water supply often deficient in quantity and bad in quality, and abominations gradually accumulating, the Trustees did not in 1817, when they applied to Parliament for further borrowing powers, and for authority to raise the rate to 1s 6d per £ rental (except in the case of those whose houses were more than 200 yards distant from a public well), did not seek to obtain powers to do something really effectual in the way of prevention. They acquired certainly more extensive powers for the cleansing of the streets, but householders and feuars were still under the necessity of themselves removing dung and filth, and only at certain hours of the day. It is exceedingly probable, therefore, that ash-pits would be allowed to remain uncleared for many weeks at a time, and therefore keep the air of the districts in a state of constant contamination. Nor was a remedy sought till 1840—except in regard to the supply of water.

This was always a source of great anxiety to the Trustees as well as the inhabitants. According to Weir, it had at one time to be carted into the town. After the reservoirs were constructed, it was frequently so deficient as to necessitate the giving the supply at the public wells only at certain hours of the day. It was at these wells where the great majority of the inhabitants obtained what they required, there being no power to oblige the feuars to lead branch pipes into their respective properties. The Trustees, however, allowed branch pipes to be led into the houses on the payment of a certain fixed sum, and thereby became bound to keep up the supply in all time coming, on the persons who obtained this privilege continuing to pay the ordinary rates. About 200 only took advantage from first to last of this permission.* The consequence, therefore, during seasons of scarcity, must have been anything but favourable to cleanliness or health in the case of poor families who had to carry for a considerable distance all the water they used; and to a considerable extent this must still be the case, as has been already observed, with those living in houses unsupplied with so necessary an article as water, no steps having been taken by those in authority, when applying for the Act to be presently mentioned, to obtain the power of compelling the feuars to lead branch pipes into their respective properties. At the same time it is so far fortunate that the supply is abundant and almost always of good quality. For this, however, the inhabitants are chiefly indebted to the enterprise of a private company, and not to the Trustees, who failed to take complete advantage of the powers conferred on them for the purchasing of springs within a distance of six miles from the town. This company (the Shaws Water Company) was incorporated in 1825 by Act of Parliament, which gave them *inter alia* the power to contract to supply feuars and householders with water, and at such a price as might be agreed on, but without encroaching on the rights conferred on the Magistrates and Water Trustees by the Acts just recited; and these powers were extended by an Act which was obtained in 1845, and which authorised the com-

pany to give a supply for household purposes on an annual payment of not more than 5 per cent. on the rental. The success of the company was immediate and decided, and has since been uninterrupted, many of the old buildings being at once supplied by their pipes, as well as almost all the new houses built since its incorporation. Indeed, so satisfied were the Trustees with the enterprise displayed by the company, as well as with the abundance and purity of the supply, that they almost at once began a series of negotiations for obtaining the additional supply rendered necessary by the increase of the town. These negotiations finally resulted in 1836 in a contract whereby the Trustees on the one hand renounced their rights to supply public works and private houses, while the company, on the other, became bound to run into the Town's reservoirs 21,000 cubic feet, equal, on a rough calculation, to about 131,250 gallons of water daily. And this was confirmed by another Act obtained by the company in 1845, as well as by the Police Act of 1840, both of which are still binding. On the part of the company the agreement has been well fulfilled. In making the bargain, however, the Trustees committed a grievous error, and have since exhibited considerable remissness, for they omitted to secure additional storage accommodation in the shape of new or larger reservoirs, the effect of which may be judged of from the fact that for the water necessary for the supplying of the public wells and the privilege pipes, they have, for nearly eight months of the year, from the springs and streams running into their own reservoirs, far more than sufficient. The consequence is, that for these eight months they have to run to waste this valuable commodity, which if properly stored could be turned to good account in the way of cleansing the streets, lanes, courts and sewers. Indeed, with this supply, not to speak of the vast quantities of surplus water wasted, in consequence of the great rain-fall, by the company itself, the town, notwithstanding its other disadvantages, might be made one of the cleanest in the kingdom. It is true that other reservoirs could be made, and it is equally true that for one of the purposes mentioned—the cleansing of sewers—the Trustees have the power of contracting by the Company's bill of 1845. But although the company have, during the prevalence of epidemics, occasionally granted supplies either gratuitously or, as some think, at moderate rates, for the washing out of lanes and gutters, the expense in either case would be so large that it could scarcely be incurred with the present rates and borrowing powers of the Trustees. Indeed it would be infinitely preferable to take measures for securing the whole of the Company's property, and for obtaining power to compel the feuars to supply their respective tenements with water, and to tax them according to the Shaws Water rates. In this way, although it would be always desirable to have a certain number of public wells, the necessity for having them so closely studded over the town as at present would be entirely obviated. As to the extent of the Shaws Water works, it may be stated here that the reservoirs cover an area of about 350 acres, and have a surface drainage of 6,000. They give a supply to public works of 2,860 cubic feet per minute for 12 hours of every working day, equal to about 12,736,000 galls. daily; that taken by the inhabi-

* This number includes privilege pipes for public works as well as private houses.

tants, independent of the 21,000 cubic feet already mentioned, and taking the population at 40,000, being no less than 42 imperial galls. for each individual. Besides this, the company is bound to show on the 1st of April of each year that they have a four months supply in their reservoirs independent altogether of what may be expected from subsequent rains during that time.

But, notwithstanding its defects, the Act of 1817 was allowed, as has been said, to continue in force till 1840, when, in consequence of the increase of population, and the greater importance of the town, from its having been erected into a Parliamentary burgh in 1832, new powers were asked and obtained. According to these the rights of the Trustees in regard to the obtaining and supplying of water, including the agreement with the Shaws Water Company, were confirmed, authority being given, at the same time, to borrow a sum not exceeding £20,000, in addition to the sum of £30,000 which had been already borrowed under the previous Acts, and to raise the rates if necessary to 2s per pound rental. Power was also given to the Trustees to construct a complete system of main sewers, the expense to be laid on the feuars on the lines of the streets or courts so drained. Besides this, it was enacted that the feuars should have the foot-paths adjoining their properties paved with flat hewn stones, and the streets properly causewayed, the expense to be proportioned to the rental of their respective properties, and their subsequent maintenance to fall on the Trustees. Instead of causewaying, the Trustees had authority, on the petition of the feuars, to order macadamizing instead, but with power to order causewaying afterwards if they saw fit. Besides this, the proprietors of closes were bound to clean them twice a week at their own expense, and under a penalty for failing to do so; and all persons were to remove accumulations of dung, &c., of more than 30 days' standing, provision being at the same time made that if such accumulations should be certified by any two physicians or surgeons, and by any three Trustees, to be prejudicial to the health of the inhabitants, they should be removed after six hours' notice. It was further enacted that all keepers of lodging-houses for the accommodation of the labouring and working classes should be bound, in the event of the occurrence of contagious or infectious disease, to give intimation to the police not more than 48 hours after its outbreak, and that the police on receipt of this information should cause the lodging-houses so circumstanced to be fumigated, washed, or cleansed at the sight of a medical practitioner.

Here, then, were powers moderately ample, and such as if carried out would very probably have made the town occupy a more favourable position in the returns of the Registrar-General. What was done as regards the water-supply has been already mentioned. As to the streets, there can be no question as to the authorities having exhibited gross remissness, for, although considerable improvement has been effected within the last few years by recausewaying and repaving not a few of the older ones, in the newer parts of the town the Trustees have not insisted on the feuars making the pavements (almost all of which are soft) according to the terms of the Act, and have allowed most of the new streets to be macadamized only and to such an extent that

it will be a considerable time before they will be able in this respect to get out of arrears. Nor do they appear to have taken advantage of their powers to causeway unfinished streets and afterwards charge the feuars who may come to build on the line of street. It may be answered to this that they have exhausted their borrowing powers and are unable to do this, but as will be afterwards more particularly referred to, they have still power to raise the rate an additional 3d per pound rental; so that they have still a considerable resource at their command. As to the removal of dung and the cleansing of infected houses, the powers for so doing have not been regularly enforced, except, perhaps, during the epidemic of fever in 1847, and only at the instance of the Parochial Board. Several prosecutions took place in 1849 and 1854, but these were also instituted by the Parochial Board on certificates from the district surgeons, and in compliance with instructions from the General Board of Health. In fact, it required the two tremendous epidemics of fever in 1844 and 1847, and the no less terrible epidemic of cholera in 1849, to open the eyes of the men in authority to the urgent necessity for doing something really thorough and effectual. By their powers to make bye-laws, accordingly, the Trustees, in 1849, ordered ash-pits in closely crowded localities to be done away with, and householders to expose their refuse for removal by the scavengers only at certain times night and morning, the laying out of filth at any other time being visited with a penalty. But although there can be no doubt as to the disgusting state of many of these ash-pits, which were frequently bordering on the windows of inhabited houses, the inevitable effect of the order has been the accumulation of nuisances within houses already filthy and wretched enough, or, in spite of the penalty, the exposure of the filth in the lanes or courts themselves. Nor would it have been easy till four years ago to enforce the penalty or prevent the nuisance without the undivided attention of a whole regiment of police. The difficulty, however, after 1856 ceased, for the Trustees who had constituted themselves the "Local Authority" for the working of the Nuisance Removal Act of that year, acquired the power, which was wanting in their own bill, to cause the feuars to supply their tenements with proper ash-pit and privy accommodation. But this they have not done, even although it must be admitted that they have erected seven public water-closets and three urinals in different parts of the town, for what will these avail in face of the lamentable fact that there are whole streets without a public or even private convenience? And for this neglect they have no excuse. They have one, apparently, in the overbuilt condition of many of the courts, and in a disposition to deal leniently with some of the poorer feuars. But it would surely be an easy matter to get those so circumstanced, and having properties contiguous to each other, to combine and set aside a portion of one or other of these properties for the erection of conveniences common to their tenants. As it will, at all events, not be denied that it is the duty of every feuar to provide his tenants with what is necessary to the observance of common decency, it is the more incumbent on the Trustees to show no mercy in the case of those of ample or even moderate means.

But there was one salutary improvement effected

by the Magistrates and Council previous to the action taken by the Trustees in 1849. This was in reference to the burying-grounds, which have been already simply noticed as forming nuisances of no small magnitude. Of these the most offensive was the oldest, and called the West Kirkyard, from its surrounding the old parish church. It appears to have been at first of very small dimensions, and to have been afterwards increased to about an acre by successive additions made between 1589 and 1721. At the latter date it was *gifted* to the town by the then superior, and continued afterwards to be the only burying-ground till 1786, when, in consequence of its crowded state, the magistrates obtained another in Inverkip Street, of the extent of about 3 roods 3 falls, and at an annual feu-duty of £2 12s 3d. To this, again, an addition was got in 1816 of about 103 falls, at an annual feu-duty of £5 2s, and a grassum of £400, the expense of both places being defrayed by disposing of the ground in lots or lairs. Notwithstanding the new accommodation, however, interments continued to take place in the West Kirkyard till two years ago, when its loathsome condition became, even to the most callous, so appalling and repulsive as to lead the present Master of Works, with Mr J. H. Teulon and others, to apply to the Sheriff to have it closed in accordance with the Burying Grounds' Act. This, after the statutory process, was finally accomplished. As regards the other two, it is hoped that ere long similar measures will be taken, for although they may be said to have been, when opened, to all intents and purposes extramural, they have, from the increase of the town, become so much surrounded with houses, and, from the great number of interments, so over-crowded, as to render this imperatively necessary. Of the extent of this over-crowding some idea may be formed from the fact that a few years ago, on examination by dipping with a spear, it was found that the coffins in many places were only about 1½ feet from the surface. The soil, moreover, has become so much elevated above the level of the surrounding streets, as well as the Infirmary grounds, which are quite contiguous to it, as to require, for the sake of that institution alone, the Directors of which some years ago had to form drains through their ground for the purpose of receiving in a great measure the foul water escaping from the burying-ground, more especially during heavy rains (as has been already incidentally noticed in the letter quoted above), that no further delay be allowed to take place in effecting its closure. To such a proceeding no reasonable obstruction can be raised on account of any dearth or want of accommodation, for the Council, by the opening of the new Cemetery in 1846, have placed within the reach of the poorest of the community as much ground as may be necessary for the burial of their dead, and at a price no more than sufficient to pay for its preparation. This great undertaking was the result of the unseemly and over-crowded condition of the old burying-grounds just detailed, and for its accomplishment the community is indebted to Mr John Gray, a member of the Town Council, and well known to the lovers of horticulture and landscape gardening in many parts of Scotland and England. Principally through his instrumentality the present Superior was induced to grant at the lowest feu-duty allowable by the entail (5d per fall) about 20 acres of ground outside of the town, and occupying a very beautiful and command-

ing situation. At an expense up to the present time of about £18,000 this has been kept up and laid out with walks and carriage drives, and ornamented with shrubbery and plants in such a manner as to make it unsurpassed by any cemetery in the country, and from its being open at all reasonable hours, to serve, besides its more immediate object, the purpose of a great public garden. Nor were the Magistrates and Council, when doing this, unmindful of the old burying-grounds, for in these they expended in the way of levelling, making walks, and planting shrubbery, a sum of upwards of £200, which have to some extent deprived them of their horrors. And for this they have had their reward, for extravagant and hazardous as the expenditure was by many at the time considered, the demand by families for ground for immediate and prospective use has been so great that the prices paid in this way have been already sufficient to cover the original cost and subsequent maintenance, the number of individual plots of ground sold over and above the common ground set apart for paupers, and varying in price from 22s 6d to £120 or thereabouts, amounting at the present time to about 2,400, and the number of interments up to the end of 1859 to 13,765. From this it is easy to conceive what would have been the condition of the other burying-grounds in the absence of the new one. Indeed, so impressed are the Magistrates with the advantages accruing to the community from what they have already done, that they have felt themselves warranted, within the last few months, although there is accommodation for many years to come, and allowing even for increase of population, in making application for additional ground. And this the Superior, with that high-souled liberality which has uniformly characterised all his transactions with the community, has granted to the extent of 20 acres more, and at a feu-duty only of 10d per fall. Already the authorities are busy in laying out and ornamenting the ground in such a manner that when completed the whole Cemetery will be intersected with walks to the extent of from 10 to 12 miles.

And here it may not be out of place to mention two other benefactions which Sir Michael R. S. Stewart, since entering on his estate, has made to the community, viz., a park of five acres, occupying a commanding position above the centre of the town, and another of about seven acres above the eastern portion. Both of these have been laid out by the Magistrates with shrubbery and walks at an expense of £2,500, one of them having been especially designed for the use of the working classes, who have not only free access to two finely-constructed bowling greens, as well as quoiting and cricket grounds, but also the liberty of indulging in any of the more ordinary games or exercises usually considered as conducive to health. The Water Trustees, moreover, have just succeeded in obtaining from Sir Michael, and on easy terms, a piece of ground which they intend to prepare as a public washing green. For the initiation in this, indeed, the inhabitants are indebted to Mr Charles Grey, lately one of the magistrates. The ready concurrence of the superior, however, coupled with what he has otherwise done, clearly shows that he is not unmindful of his duties as a laudlord, and that he is well worthy of the high position which Providence has assigned him.

Having thus shown how the authorities have

applied their powers as to water supply and abatement of certain nuisances, it remains for me now to state what they have done as regards *drainage*, and what they have still to do.

As has been already noticed, the state of the main-sewers was exceedingly defective, and for long a frequent cause of complaint. About eighteen years ago it engaged the attention of Mr Allison, the present indefatigable Master of Works, who then proposed a scheme for its remedy.* This does not appear, however, to have received at that time the encouragement to which it was entitled, and the matter remained in abeyance till 1849, when, in consequence of the ravages of cholera, the inspector sent down by the Board of Health directed anew the attention of the Trustees to the necessity of doing something in the way of general drainage without delay. After this the authorities were more disposed to give the matter a serious consideration. At the same time, it was not till 1854 that Mr Allison was allowed to put his scheme into operation. At that time, through the influence of the late Provost Martin, supported by the late Bailie Haddow, chairman of the Harbour Committee, and Bailie M'Ilwraith, then chairman of the Street Committee, the Trustees† were induced to let Mr Allison carry out, in the first place, the exit sewers *beyond the harbours* to the outermost breastwork of the quays, so that now the whole of the drainage of the town is led directly into the Clyde, the flow of which is sufficiently strong to remove it at once beyond the possibility of offence. Since that time they have been gradually constructing a general system of deep tubular drainage. With these they have already wholly supplied no fewer than 28 streets, and partially about 17—in all about six miles of sewers—at an expense of about £11,000. But much still requires to be done, and of this some idea may be derived from the fact (to mention only one), that the drains from many of the elegant villas bordering on the western shores of the town, are allowed to empty themselves on the beach, and close by a road which is much frequented as a promenade. As the authorities, however, have the power to charge the outlay on the feuars on the line of the streets, they will have no excuse if what they have still to do is not done soon. It is certainly to be regretted that they labour under a difficulty in the case of streets not wholly feued, in consequence of their Act not authorising them to construct drains in advance and out of the rates, and charge the expense on the feuars who may afterwards build on the line of streets so benefitted. But the greatest difficulty they have to encounter is the refusal of a large proportion of the feuars to lead tributary drains from their respective properties into the main ones—a state of matters, it is plain, which will render the whole system of little or no avail, and tend to throw discredit on its able and intelligent projector. Even here, however, the Trustees are not blameless, for the power which was wanting in the Local Act of 1840 to compel the feuars in this matter, is supplied by the Nuisance Removal Act of 1856, the working of which the Trustees have taken into their own hands; and yet, although such a gigantic pol-

lution as the West Burn* (not to speak of others) is mitigated only to a slight degree, not a single prosecution has been instituted in cases of refusal. Indeed, so far as the working of the last mentioned Act is concerned, very little has been done in comparison with the great powers it confers. There have, certainly, been a few prosecutions in the case of accumulations of pigs and manure, and two in the case of houses unfit for human habitation, but as has been already said, there are still courts and alleys, and even streets, without a public or private water-closet, and many houses nearly or actually in the category of those which the Trustees have succeeded in getting condemned; while at the same time, there are still to be found feuars who are disposed to occupy the whole of their ground with houses utterly unprovided with conveniences necessary to common decency. Nor is the remissness less marked in regard to the working of the Smoke Nuisance Act, which has also been taken under the charge of the Trustees, for although the Act came into operation in August, 1858, nothing was done till about nine months ago, when notices were sent to the proprietors of public works calling upon them to consume their smoke; and although not the slightest improvement has since been visible, no measures have been taken to keep the authors of the nuisance from setting the law at defiance.

To return, however, to the Nuisance Removal Act, which may be said to include the last, the Local Authority, about a year ago, committed a very great mistake in transferring the duties of inspector from an officer specially appointed for the work to the Superintendent of Police. It is by no means my intention to say that a superintendent of police is unfit for such an office, but as his duties are already sufficiently onerous, and as he deposes his work to his subordinates, who, so far as can be seen from the present state of the closes, &c., have nothing like an adequate notion of what constitutes a nuisance, it is clear that the work will never be thoroughly nor efficiently performed. There can be no doubt, at all events, that if the inspection is to form part of the duties of the police establishment, they ought to be devolved on a lieutenant, the whole of whose time could be well occupied by attending to the working of the Nuisance Removal, the Smoke and the Lodging-house Acts.

But, independently of all this, there is a grave defect in the constitution of the Nuisance Removal Act itself. An inspector may be active and fully alive to what is expected of such an officer; but as the Local Authority, in a place like Greenock, is composed of feuars whose pockets are likely or liable to be touched by the carrying out of any great scheme of public improvement, it is not at all improbable that in many instances his reports will be followed by no action whatever. Being removable, too, from year to year, or at the pleasure of the Local Authority, he will, to all intents and purposes, be gagged. Besides, *quis custodiet ipsos custodes*? By the 43d section of the Act, a prosecution may be set about by the Procurator Fiscal, the Inspector of Poor, or any two householders, but as there is no fund out of which the expenses of such a pursuer may be paid in the event of his failing to establish

* I have been informed that on this subject the late Provost Baine consulted Mr Errington, C.E., but without any result.

† I believe Mr Wm. Curtis was also of great service in this matter.

* It is right to state that Roxburgh Street and Inverkip Street are now supplied with main drains on the new system.

his case, it is not to be expected that much will ever be done in this way. For these reasons the inspector should be removable only by some authority such as the Board of Supervision or the Sheriff of the County, to either of whom he could be answerable for neglect of duty, or have the right to appeal in the event of the Local Authority resisting any reasonable recommendations.

Having, then, in a general way shown what has been done and may still with advantage be done under the powers already in the hands of the authorities, it may not be out of place to point out a drawback under which they labour in regard to the effecting of such improvements as the widening of streets, &c. By the Nuisance Removal Act, houses unfit for human habitation may be condemned. The Trustees, however, have no power, although the ground on which these may be built may be necessary or desirable for the widening of a street, to expend the funds of the rate-payers on its purchase. Nor have they the power to do this in regard to any description of property, with the exception of what exists on the one side of a lane called Taylor's Close, which is specially pointed out in the Act of 1840, in consequence very probably of its having been for many years a perfect hot-bed of disease and every conceivable vice—a character, unfortunately, which it still retains. To a certain extent the Trustees have taken advantage of the power, and with very apparent benefit to the locality. But even there, not to speak of other parts of the town, much requires to be done. At the same time it would be necessary, in any measure obtained for this purpose, for the Trustees to have the power of insisting on a settlement by a jury or judicial authority in the event of the proprietors of tenements or ground demanding an unreasonable or exorbitant price.

But before applying to Parliament for new powers, it is incumbent on the Trustees, seeing the amount of work otherwise before them, to use up the powers they already possess. They have certainly exhausted their borrowing powers, but, as has been already incidentally noticed, they can still rate for an additional 3d per pound rental, the rate since 1840 having been kept at 1s 9d per pound. This, if levied regularly from 1840 till now, would have realized a sum of from £15,000 to £20,000, which ere this might have been turned to profitable account. It may be said that a vast deal has been done during the last few years, the Trustees having expended on the

Cemetery and Burying-grounds about	£18,000
Public Parks,	2,500
Drainage,	11,000
Public Closets and Urinals,	800
Public Wells,	550
	<hr/>
	£32,850

But it should not be forgotten that the Cemetery has really paid itself, and that the expense of the common sewers is recoverable from the feuars whose properties are benefitted by them, and still less, that the whole amount, large as it may seem, falls below the sum which a single disease of a preventible character has cost the community during the last half century. At all events, great as the already completed works may to many appear, it must be evident to the most indifferent observer, that unless followed by operations somewhat in accordance with

what has just been indicated, they will not be attended by those results which the ratepayers may have been led to expect from them.

From a consideration, then, of the whole of this part of the subject it may be concluded,

1st. That it is desirable that landowners in towns or in the vicinity of towns and selling land for building purposes should have it surveyed so that (a) the streets should not be below a fixed minimum width, say of 50 or 60 feet; (b) that the intervals between any two streets should not be below a fixed minimum width; and (c) that the area to be built on should be clearly defined, and the building of back lands entirely prevented.

2d. That in all towns there should be a court in which the feu contrac's should be registered, and without the permission of which no new buildings or alterations of old ones should be made.

3d. That the local authorities in towns should have the water-supply in their own hands, and that they should have power to compel every feuar to lead branch pipes into his property.

4th. That the Inspector of Nuisances should not be removable by the Local Authority, but by some neutral party, such as the Sheriff or Board of Supervision.

5th. That house proprietors should provide their tenants with conveniences in the shape of proper ashpits and water-closets.

6th. That in towns, the streets, as a general rule, should be causewayed and have side pavements of flat hewn stones, the expense to be borne by the existing or subsequent feuars on the line of the streets.

7th. That all streets should have main drains, the expense to be borne in the same way as that of the causeway.

8th. That each tenement should have a tributary drain leading into the main one.

9th. That the surface gutters and drains, particularly where the water-supply is abundant, should be frequently flushed, more especially in warm weather.

10th. That for the effecting of such improvements as the widening of streets, the local authorities should have the power to purchase property, the price to be paid to be determined by mutual agreement, or failing that, by a reference to a judicial authority, whose decision should be final and binding.

B. Having thus disposed of the physical causes, it still remains for me to set before you another series of no small energy in the production of disease and death. These are the *MORAL*. No doubt they are to a considerable extent dependent on the physical, and although both act and react on each other in such a way that it becomes exceedingly difficult to determine which of the two may have been the first in operation, still it is equally certain that the *moral* or *social* have a potency peculiarly their own. At the same time it must be premised that, so far as Greenock and the other large towns of Scotland are concerned, nothing like a thorough comparison can be instituted, in consequence of the Registrar General having as yet confined himself, as regards births and marriages, to a mere summation, no data having been furnished to show the occupations, ages, parentage, and other

matters which require to be taken into account in a systematic exposition like the present. For this reason much of what is to follow must be accepted as the result of a personal, but by no means an inconsiderable experience of the habits and circumstances of the people among whom, during a large portion of my professional career, it has been my lot to labour.

I. Here, then, it has to be noticed, in the first place, that there are large numbers of the inhabitants who have little or no conception of the necessity of personal and domestic cleanliness in the prevention of disease. This, of course, is true of every community of any importance. It appears to me, however, to be more peculiarly the case as regards Greenock. Be that as it may, the fact will be best appreciated by looking at the population in some of its social aspects.

It has to be observed, then, that there is in Greenock a large proportion of low Irish and Highlanders (particularly Western Highlanders) relatively to the whole population. According to an analysis of the last census, prepared for the magistrates by Mr Adam, the present Town Chamberlain, the town contained about 7000 Irish—nearly one-fifth of the whole population. As regards the Highlanders, it is difficult to form an estimate in consequence of the census returns not giving the birth-places according to counties. Something approaching to one, however, may be formed from the following facts:—According to a return just prepared for the Crown Agent by Mr Malcom, the Inspector of Poor, the total number of *adult* paupers relieved during the year ending May 14, 1860, was 1,183, 309 of whom were born in Greenock, 351 in other parts of Scotland, 9 in England, 222 in Ireland, and 1 abroad, 201 having their birth-places unascertained. Then of the 351 said to have been born in other parts of Scotland than Greenock, no fewer than 185, more than one-half, belonged to the Western and North-western Highlands, particularly to Argyshire. Again, from an examination made by myself of the Marriage Registers for 1855 (the only year in which the entries show the birth-places of the contracting parties), it is found that of the 880 persons who were married in that year, no fewer than 191 were natives of the same parts of the Highlands, 240 belonging to Greenock, 235 to other parts of Scotland than the places specified, 28 to England, 167 to Ireland, and 19 to foreign parts. It is plain, therefore, that the Highlanders and Irish bulk largely in the community. Nor is it to be wondered that such a large proportion of both should actually exist, for the town being readily accessible, they naturally crowd into it in great numbers, more especially during seasons of marked activity in public works where the demand for unskilled labour is considerable, such as in ship-building yards, foundries, &c. Steeped, too, for the most part in the grossest ignorance, and having little or no conception of anything above the gratification of their appetites and passions, they are soon induced, from the temporary enjoyment of wages higher than what they had been previously accustomed to, and not liable, in their estimation, to reduction or cessation, to rush into matrimony with an impetuosity truly deplorable. Hence the high marriage and birth rates comparatively with those of the other large towns in Scotland, as may be seen from the following tables:—

Table showing the proportion of Marriages to the population.

	1855.	1856.	1857.	1858.	1859.	Aver.
	One in	One in	One in	One in	One in	One in
Glasgow...	117	105	104	121	112	111
Edinburgh	126	130	132	134	122	128
Dundee...	132	110	119	126	130	123
Aberdeen..	146	169	146	157	148	153
Paisley....	140	121	123	134	111	125
Greenock..	87	89	103	126	114	103
Leith.....	111	126	124	136	114	122
Perth....	116	112	113	123	111	115

Table showing the proportion of Births to the population.

	1855.	1856.	1857.	1858.	1859.	Aver.
	One in	One in	One in	One in	One in	One in
Glasgow...	28	24	23	24	24	24
Edinburgh.	37	33	33	34	33	34
Dundee....	30	26	25	26	26	26
Aberdeen..	36	32	32	32	32	32
Paisley....	29	28	26	27	26	27
Greenock..	21	19	19	20	21	20
Leith.....	31	30	29	30	30	29
Perth.....	36	34	34	33	32	20

Nor is this a mere theoretical deduction, for from the following tables, prepared from the marriage returns of 1855, it will be seen that out of the 880 married in that year, no fewer than 122 (of whom 102 were females) or 13.7 per cent, were below the age of 21, the numbers for the West, East, and Middle Parishes being respectively, 37, 42, and 43, or at the rate of 9.6, 16.1, and 17.3 per cent of those married in these districts. But this does not show the whole of the case, for it has to be stated farther that this relatively high proportion of early marriages obtains to the greatest extent in the very parishes where the population has the greatest number of the poorer and more ignorant classes—viz., the East and the Middle—and if anything were wanting to show what the amount of the ignorance referred to may be, it has only to be stated that, while in the West Parish, with 186 marriages, only 65 signed their names in the register with a mark, in the East and Middle, with 130 and 124 respectively, no fewer than 58 and 89 occupied this unenviable position.

Table showing the numbers and ages of the persons married in 1855.

Ages.	West Parish.		East Parish.		Middle Parish.		The Three Parishes.	
	M.	F.	M.	F.	M.	F.	M.	F.
16		1		1		1		3
17		4		5		2		11
18		3	2	5		6	2	14
19		6	3	14		15	5	35
20	6	17	2	10	5	12	13	39
20-30	129	127	89	71	95	76	313	274
30-40	36	23	21	18	15	8	72	49
40-50	9	6	9	5	5	4	23	14
50-60	6		3		2		11	
60 & upwards			1				1	
Not stated.				1				1
Total Mar.	186	186	130	130	124	124	440	440

Table showing the Birth-places of those married in 1855.

	West Parish.		East Parish.		Mid. Parish.		Three Parishes.		Ttl.
	M.	F.	M.	F.	M.	F.	M.	F.	
Greenock.....	40	70	30	44	20	36	90	150	240
W. & N.W. Highlds	41	53	26	29	18	24	85	106	191
Other Parts of Scot.	69	43	43	35	28	17	140	95	235
England.....	6	4	8	2	7	1	21	7	28
Ireland.....	24	14	22	19	44	44	90	77	167
Colonies, &c.....	6	2	1	1	7	2	14	7	19
	186	186	130	130	124	124	440	440	880

Table showing the numbers who signed their name with a x in the Registers.

Parish.	M.	F.	Ttl.	Equivalent to	M.	F.	Ttl.	per cent.
West.....	28	37	65		15	19	16	
East.....	16	42	58		12	32	21	
Mid.....	38	51	89		22	41	35	
Total.....	82	130	212		18	29	24	

Now with persons so situated it is not uncommon to find many commencing their married life without an article of furniture they can call their own, or with scarcely a rag to change another. If they contrive to have dwellings of their own, these are almost sure to be of the most wretched description possible. For the most part, however, they are unable to keep a comfortable roof over their heads, so that they either crowd into low lodging houses, or, as is not uncommon even with a higher class of workmen, become part tenants of a room and kitchen. In either case, with young families springing up around them, they are apt to lose any little respect for cleanliness or decency they may have once possessed, and to fall into a state of the most abject degradation possible; acquiring, at the same time, those habits of intemperance which are alone more than sufficient to render of no avail the most skilfully directed attentions of the philanthropist. But there is intemperance in other things as well as drink, and this leads me to speak of a class higher in the social scale than that referred to. With this class there is frequently noticed at the earlier part of their married life such an extravagance in dress, and such a want of economy, as to plunge them ere long into difficulties out of which they can scarcely ever escape. From the want of proper training they are unable, or consider it beneath them, to cook or live on plain but substantial fare, and give themselves up to indulgences which can only be gratified by an almost complete swallowing up of their hard-earned wages. By and bye debts weigh down upon them, till ultimately, in not a few instances, they sink into a state not far removed from that of the order more immediately below them. Apathetic and indifferent to all that is good, they are constantly passing from the pawn-shop to the grog-shop, so that in too many cases it is not uncommon for the medical man, on entering their houses, to find them, in spite even of wages ranging from 30s to 40s per week, with scarcely a stool to sit on, or a blanket to cover their nakedness. Then with children neglected in every possible way—unwashed, ill-clad, ill-fed, and cooped up during the night in boxes into which the pure air of

heaven is scarcely ever allowed to enter, the wonder is not that disease and death should ravage their homes, but that they should ever have a respite from calamities so terrible. But granting that many of the classes referred to may be fortunate enough to avoid evils of such magnitude, the condition in which not a few of them keep their houses is disgraceful in the extreme. Some may have an excuse in the physical disadvantages already alluded to, but there are many who never make the slightest effort to wash their floors, clean their bedding, or even change their clothing. How they contrive to spend their time is to me a mystery, unless it be that they are mindful of everybody's business but their own. Be that as it may, enter their houses at any time, and every thing is foul, untidy, and loathsome. This is more particularly the case in certain classes of lodging-houses frequented more especially by the Highlanders and Irish, but which, from the rate charged, do not come under the Lodging-Houses Act. And here, in passing, it may be allowed me to express my regret that this measure is confined to houses where the sleepers pay no more than 3d per night, for it is plain that persons disposed to evade the law can easily do so by simply stating that they charge 3½d for a bed. Besides, though not such as might be wished, the houses under local supervision are, as regards cleanliness and breathing space, superior to very many not subject to the operation of the Act. To have been even moderately efficient it should have been framed, as was actually the case on the first introduction of the bill, so as to have embraced houses in which the charge was not more than 3s 6d per week. Even then, there would have been some attempts at evasion, but these could have been easily met by the knowledge which an intelligent inspector could acquire, not only of the occupations of the lodgers, but also of the rate of wages at which they are usually employed. It is not at all probable, for example, that an apprentice, say with 5s per week, would expend two-thirds of his earnings on lodgings alone, and yet there is an immense number in what may be called their trade pupillage, who are, in the matter of sleeping accommodation and the like, worse off than the most abandoned tramps who frequent the licensed houses.

II. But, irrespective of inattention to cleanliness, there is next to be noticed in ascending the social scale, that there are numbers of the population who manifest *great ignorance in the rearing of children*—not certainly so much in the matter of diet as in that of clothing. It has been already shown how much the climatic conditions of Greenock necessitate a more than ordinary avoidance of the dangers resulting from changes of temperature and the like, and yet nothing is more common than to see swarms of children during the most variable and intemperate seasons of the year attired as if they were living in the most sunny regions of the South. In defiance of the stern remonstrances of nature, as shown in the blue knees, and arms and faces pinched with cold, there are hosts of mothers in the well-to-do classes who appear to have no hesitation in sacrificing health and comfort to the imperious demands of fashion. If persons so situated can exhibit negligence so unpardonable, is it to be wondered that in the classes below them there should be frequently observed errors in this respect still more disastrous—the most common of which, to mention only one, is the un-

seasonableness of the hour when mothers take out their children, it being a matter of frequent occurrence to see groups of lazy, gossiping women, with half-clad and shivering children, on the coldest day in winter, or, what is more common, the chilliest period of evening, standing in the draught of a dingy passage or a crowded court, or sleepily sailing along lanes by this time of the day too redolent of almost every impurity. As showing to a certain extent the effect of this, it has only to be stated that while in the case of children below 5 years of age the percentage of the deaths from diseases of the respiratory organs during the four years ending 1859 was in Edinburgh, 39.91, in Dundee, 40.21, in Aberdeen, 33.06, in Paisley, 34.03, in Leith, 46.15, and in Perth, 33.15, it was in Greenock, 48.66, a ratio in which it was exceeded only by Glasgow. But this will be best seen from the following table:—

Table showing the per centage in the cases of children below five years of age of the total deaths from diseases of the respiratory organs.

	1856	1857	1858	1859	Average.
Glasgow.....	54.95	53.69	56.62	49.33	53.64
Edinburgh.....	42.76	36.22	46.40	34.27	39.91
Dundee.....	40.80	34.70	48.16	37.19	40.21
Aberdeen.....	35.61	32.47	35.15	29.03	33.06
Paisley.....	28.31	44.86	32.78	31.19	34.03
Greenock.....	53.27	38.31	50.74	52.34	48.66
Leith.....	42.87	50.	52.52	39.21	46.15
Perth.....	27.77	34.42	40.44	30.	33.15

III. Such being the condition of large numbers of the population during health, the next subject calling for remark is *their conduct during disease*. In general terms this may be said to resolve itself into a disregard of medical aid, which the people manifest in three ways, (a) by not procuring it, (b) by delaying to procure it, and (c) by refusing or distrusting it when actually obtained. Shortly after the commencement of the new system of Registration in Scotland, the public was startled by the announcement that about 50 per cent of the deaths in Greenock occurred without any attendance whatever. In consequence of this, the Parochial Board instituted an inquiry, which resulted, after a personal visitation of every family in which a death was marked as occurring without medical attendance, in a complete exoneration of that body from the charge of neglecting the sick poor, the report published by the committee of investigation showing that, though the proportion of unattended by medical men was not so great as represented, the number was, at the same time, far higher than could be justified—as will be seen from the following extract:—

“Your Committee found cases in which two or even three medical men had been in attendance, and yet marked as having no doctor. Thus, out of 126 who are said to have died without medical attendance, 58 actually were attended by a doctor, or had medicine and medical advice; 10 deaths were sudden; 3 were premature births; and 14 were cases such as aged persons dying from exhaustion of nature, or dismissed from the Infirmary as incurable, in regard to which the relatives were persuaded that the services of a medical man were not necessary and could not possibly be of any advantage. Thus there were really but 41 in these circumstances instead of 126. Of the whole number 4 were receiving

parochial relief, and of these 3 had medical attendance. The rest, with a few exceptions of men who were at the time out of employment, and therefore not able to pay for a doctor, were in favourable circumstances, and could easily have secured medical attendance if they had been desirous of doing so. It is to be observed, however, as partly at least an explanation of this neglect, that in the case of children, there is a very general impression that aged and experienced women are just as much acquainted as the profession with the more common diseases to which children are liable, as well as with the best means of treatment and of cure.”

Nor has there since been much improvement in this respect, for although the registers for 1859 show (omitting the cases of sudden death) that 365 of the 1420 deaths occurring in that year, about 25 per cent, only were marked as having had no attendance, or no regular attendance, still the species of neglect was just as bad, if not essentially identical with that alluded to. As a proof of this it may be mentioned that it occurred to me to make in October last an enquiry similar to the above in the cases of of those said to have died in the previous month without medical attendance. These amounted, as was then reported, to twenty-eight. It was found, however, that “in nine instances only had there been no medical attendance—three being adults and six children. Of the former, one was a female, 76 years of age, who was in good circumstances and died from natural decay; the second was a female on the parochial roll, who also died from decay of nature, but whose friends did not take advantage of the order for medical relief with which she had been furnished, because they did not see what a doctor could do for one in her state; and the third was a man in good circumstances, who died suddenly from disease of the heart. Of the children, one was the daughter of a blacksmith, whose wife complacently told me that ‘the wean was seen by its Auntie, who was as guid as ony doctor;’ the second was the infant daughter of a person styling himself an ‘herbalist,’ and who, I have no doubt, considered himself as at least equal to the whole faculty; the third was a sailor’s infant daughter, whose disease lasted for twelve hours only, and did not appear to the mother to be at all of an urgent nature; the fourth was a porter’s infant daughter, who had been weak from birth, and had been attended by an experienced midwife; the fifth was a foreman carpenter’s infant daughter, who had only been two days ill, and under the fostering care of her grandmother; and the sixth was the illegitimate daughter of an ironmoulder, who, according to the mother’s account, would not provide medical aid although told that the child was labouring under scarlatina. In addition to these very suggestive facts, it was ascertained that with the exception of the pauper, the relatives of the whole of these were in circumstances sufficient to enable them to procure medical assistance, and that the remaining eighteen had been all provided with attendance, several having actually enjoyed the questionable luxury of ‘three doctors.’”

But this, bad as it is, shows but a small part of the case, for it consists with my knowledge, as well as that of my professional brethren, that many of the deaths certified as having had medical attendance, were seen only once by a qualified practitioner. In not a few of these aid was asked when it was too late to be of any avail, the relatives complacently telling the

doctor that he had been called in "to save reflections." Not that the patients, particularly if they were children, were without medicine, for fifty chances to one they were well drugged beforehand with the most nauseous and possibly the most contradictory articles of the pharmacopoeia.

Then, in the case of such diseases as hooping-cough, measles, &c., there is with a large number of the middle and lower orders an invincible belief, not that they are incident to children, but that they must necessarily come on them sometime or other. Of this some idea may be formed from the fact that of the 365 cases certified as having died, in 1859, without attendance, or regular attendance, no fewer than 179 were children who had been afflicted with scarlatina, measles, &c., as under:—

Scarlatina, -	48	Hooping-cough, -	51
Measles, -	2	Debility from birth, 39	
Small-pox, -	14	Teething, -	25

The consequence of this belief is, that when they send for a medical man, they are satisfied with his "naming" the disease, and often coolly tell him, though well able to pay for regular visitation, that they will again send for him when they see fit. But even if they do request a continued attendance, it is not uncommon for the practitioner to find that they have been acting in direct opposition to his instructions, or dosing the patient according to their own or some neighbour's whim or fancy. Besides, if he does not perform something close upon a miracle in a visit or two, he is in many cases silently or openly superseded by the calling in of another practitioner. Sometimes, indeed, two doctors may be found attending the same patient on the same day, the patient's relatives or friends deeming it necessary to have the one as a check on the other, but so uncandid as to keep both ignorant of each other's operations. The veriest paupers, even, will occasionally contrive to have other advice in spite of regular attendance on the part of the parochial surgeons. In this way there is such a change of medical men that the patients, before the close of the final scene, will perhaps be found to have run the gauntlet of nearly the whole of the faculty.

But, independently of conduct so foolish and disastrous, there are, in the case of many, certain circumstances—whether attended with poverty or not—which utterly preclude the slightest prospect of benefit from medical aid, and that more especially when the disease is of a contagious or infectious nature. Most of these have been already considered or will readily suggest themselves. Generally speaking, they may be said to be embraced by defective house accommodation and its concomitants, as well as ignorance of, or inexperience in, so apparently simple a matter as nursing. At all events, for patients so situated, their best chance of recovery is in early removal to an hospital, where they will be supplied with every comfort possible. Yet, so strong is the repugnance of large numbers, particularly of the low Highlanders, to such institutions, that they will not allow themselves or their children to be removed, though assured, or perhaps convinced, that recovery is only in that way probable. This frequently occurs even in the case of persons in the receipt of parochial relief, the present state of the law not permitting the compulsory removal of per-

sons so affected to a place of segregation. Perhaps when the patients are clearly beyond the pale of recovery, or those about them are themselves struck down, consent may be given for their removal, and then the fatal termination is sure to be imputed to the doctors of the Infirmary. Indeed, instances have occurred of patients who were so far gone as actually to die before those who were conveying them could reach the threshold of the institution. Then, as to the most loathsome of the contagious diseases (small-pox) it is with the Highlanders that there is the greatest objection to, or neglect of vaccination, although for the last three years it has been freely offered by the parochial surgeons, and for very many years at the dispensary of the Infirmary. The consequence is that it is not only among them that the greatest number of small-pox cases occurs, but also the greatest number of fatal cases—a fact which has been repeatedly noticed by the medical men in charge of the hospital.

From a review, then, of the principal moral and social causes just detailed, it must be evident that whatever their effects, these will fall, with no small degree of severity, upon the young, and hence it is not to be wondered that of the deaths occurring during the four years ending 1859, the proportion among children below 5 years of age should be high, as may be seen from the following table:—

	1856.	1857.	1858.	1859.	Average	
Glasgow...	52.9	54.0	53.8	51.0	52.9	Per Cent.
Edinburgh	41.8	33.0	40.8	34.0	37.4	
Dundee...	55.1	46.0	49.6	46.0	49.1	
Aberdeen...	35.5	33.0	31.3	35.0	33.7	
Paisley...	46.7	46.0	46.3	41.0	45.0	
Greenock...	46.8	47.0	49.1	51.0	49.2	
Leith...	47.5	43.0	49.8	39.0	44.8	
Perth.....	32.0	37.0	36.2	30.0	33.8	

It is plain, also, that there is, on the part of large numbers, not only great carelessness of, but complete indifference to infantile life. Indeed, there is reason to fear that there is actual tampering with it. Be that as it may, it is surely a lamentable fact, that Greenock, in the matter of deaths resulting from premature births or debility from birth, occupies an unfavourable position comparatively with the other large towns, as may be seen from the following table:—

	1856.	1857.	1858.	1859.	Average	
Glasgow...	0.14	0.15	0.16	0.14	0.14	Per Cent of the Estimated Populat.
Edinburgh	0.07	0.08	0.08	0.09	0.08	
Dundee...	0.14	0.16	0.17	0.15	0.15	
Aberdeen...	0.06	0.09	0.07	0.01	0.05	
Paisley...	0.06	0.09	0.07	0.09	0.07	
Greenock...	0.14	0.20	0.19	0.17	0.17	
Leith.....	0.05	0.08	0.09	0.08	0.07	
Perth.....	0.07	0.08	0.09	0.10	0.08	

It has been already shown that of the deaths occurring from this cause in 1859, no fewer than 39 were uncertified by medical men—a number which, it may be further remarked, is nearly one-half of the total deaths under this head, which amounted in that year to 65. A perusal, moreover, of the following table will show that 19 illegitimate children,

below the age of 5, were registered as having died in 1859, without medical attendance; the total number of deaths uncertified in children below the age of 5 being no less than 271 out of the 365.

Table showing the occupations or social position of those who died without medical attendance, or regular medical attendance, during the year 1859, (cases of sudden death being excluded).

	Males.	Wives.	Widows.	Children or dependants above 5 years of age.	Children below 5 years of age.	Total.		Males.	Wives.	Widows.	Children or dependants above 5 years of age.	Children below 5 years of age.	Total.
Baker.....	1	1	...	...	...	2	<i>Brought forward,...</i>	19	9	14	10	183	236
Blacksmith.....	...	...	...	1	8	9	Lumper.....	...	...	...	...	1	1
Blockmaker.....	...	...	...	...	1	1	Mason.....	...	...	1	2	3	6
Boatman.....	...	...	...	...	4	4	Moulder.....	...	...	...	...	1	1
Boilermaker.....	...	...	...	...	9	9	Musician.....	...	...	...	...	1	1
Boot-closer.....	...	...	...	...	1	1	Nailmaker.....	...	...	...	...	1	1
Brassfounder.....	...	...	...	...	1	1	Oysterdealer.....	...	...	...	...	1	1
Butter-merchant.....	...	...	...	...	...	1	Painter.....	...	...	1	...	3	4
Cabinetmaker.....	1	1	...	...	...	2	Pianofortemaker.....	...	...	...	...	1	1
Carpenter, (Ship).....	2	...	1	2	14	19	Pilot.....	...	...	...	...	1	1
Carrier.....	...	...	...	...	1	1	Plasterer.....	...	...	...	...	2	2
Carter.....	...	...	...	...	2	2	Plumber.....	...	...	...	...	1	1
Chain-maker.....	...	...	...	...	2	2	Policeman.....	...	...	...	...	2	2
Clerk.....	...	...	...	...	2	2	Porter.....	1	1	1	...	4	7
Clothier.....	...	...	...	1	...	1	Quarryman.....	...	...	...	...	1	1
Coachman.....	...	...	...	...	1	1	Rafter.....	...	...	...	...	3	3
Cooper.....	1	...	...	...	1	2	Rigger.....	...	...	1	...	2	3
Cotton-spinner.....	...	...	...	...	1	1	Rivetter.....	...	...	...	...	3	3
Engineer.....	1	...	1	...	5	7	Sailmaker.....	1	...	...	...	...	1
Farmer.....	1	...	3	...	...	4	Sailor.....	1	...	6	...	13	20
Farm-servant.....	...	...	...	...	3	3	Sawyer.....	...	...	...	1	3	4
Fireman.....	...	...	...	...	4	4	Sempstress.....	...	...	...	...	1	1
Fisherman.....	...	...	...	1	1	2	Servant.....	...	...	...	...	1	1
Flaxdresser.....	...	...	1	...	...	1	Shipmaster.....	1	...	1	...	...	2
Flesher.....	...	...	...	...	1	1	Shoemaker.....	...	...	2	...	4	6
Gabbartman.....	1	...	...	...	...	1	Skinner.....	...	...	...	...	2	2
Gardener.....	...	...	...	...	2	2	Slater.....	...	...	...	...	5	5
Gasfitter.....	...	...	...	...	1	1	Spinster.....	...	...	...	7	...	7
Gatekeeper.....	...	1	...	...	...	1	Spiritdealer.....	1	1	...	...	...	2
Glassblower.....	1	...	...	...	...	1	Storekeeper.....	...	...	...	...	1	1
Glazier.....	...	...	...	...	1	1	Sugarhouseman.....	...	...	...	...	4	4
Hammerman.....	...	...	...	...	3	3	Sweep.....	...	...	...	...	1	1
Hawker.....	...	...	...	...	2	2	Tailor.....	...	...	3	1	3	7
Heckler.....	...	...	...	...	1	1	Tanner.....	...	...	...	...	1	1
Herbalist.....	...	...	...	...	1	1	Tinsmith.....	2	...	...	...	...	2
Innkeeper.....	...	...	1	...	...	1	Tobacconist.....	...	...	...	1	...	1
Ironturner.....	...	...	...	...	1	1	Watchman.....	...	1	...	...	...	1
Joiners.....	3	...	1	...	4	8	Weaver.....	...	...	1	...	...	1
Labourers.....	7	6	6	5	103	127	Widows.....	...	...	2	...	...	2
Lighterman.....	...	...	...	...	1	1	Illegitimate Children.....	...	...	...	...	18	18
Lodging-house keeper.....	...	...	...	...	1	1							
<i>Carry forward,.</i>	19	9	14	10	183	236		26	12	33	22	271	365

For the existence of not a little of this, the middle and lower orders are entirely without excuse. For, so far as private medical attendance is concerned, they can obtain for a fee which a common porter would reject with something more than scorn, the services of the oldest equally with the youngest practitioners; while those who cannot even afford that, can get, either at the dispensary attached to the Infirmary, or through the Inspector of Poor, everything in the shape of medical aid which the circumstances of their case may require. On this subject, the Report of the Committee of the Parochial Board, already referred to, has the following:—

“In the Greenock Hospital there is a Medical Dispensary for the poor, to the funds of which the Parochial Board contributes £100 a year. Medical advice, surgical appliances, and medicines are given without charge to a large number of persons. From the last Report of the Infirmary it appears that not fewer than 1,718 persons were treated during the year, the out-door patients as they are called. The Committee have reason to believe that in this respect Greenock is more favourably situated than many other towns. Indeed, it is manifest from some statistics with which Dr Wallace has kindly supplied them, that while in Greenock 1 in 23 of the inhabitants thus receives gratuitous medical relief, in Glasgow, for example, there is only 1 in 50, and, deducting strangers from the

country, not more than 1 in 61 of the inhabitants of the city. In the Glasgow Infirmary, too, a written advice is merely given, whereas, in the Greenock Infirmary, as has been mentioned already, in addition to medical advice, medicines and surgical applications are freely given, and the cases systematically treated to a termination. It is but right to mention, however, that there has been for two years a dispensary in the west end of Glasgow, but it is as yet little more than an experiment."

As to the remedies for the evils just detailed, little need be said. Several have been already indicated. There are one or two, however, on which the opinion of the Association might with advantage be more especially given, viz.: (1) the propriety of extending the operations of the Common Lodging-houses Act to lodgings rated at and below 3s 6d per week; and (2) the compulsory separation of the sick from the healthy or *vice versa*, in the case at all events of applicants for parochial relief, when the cases are certified by the surgeon to be of a contagious or infectious nature and likely, from the condition of the place and other circumstances, to spread from house to house, or family to family.

It appears to me farther that it would be attended with benefit to different communities if medical officers were appointed under the Registration Act, whose business it would be to make inquiry into such cases of neglect as have been brought before you, as well as to report periodically on the state of the locality and other circumstances with a view to their improvement. The officers to be appointed should be men thoroughly conversant with the general habits and condition of the people. With facilities given them for admission into their houses, they might be of great service in instructing and stimulating the poorer classes to the adoption or observance of those measures considered necessary for the prevention as well as the abatement of disease. By the Registration Act Inspectors of registers are required. With officers such as those referred to, the necessity for such inspectors would, in the towns at all events, be completely done away with.

But whatever may be done, there can be little doubt that nothing will supersede the necessity or urgency of a greater attention to, or improvement in the education of the middle and lower orders, for, to use the words addressed by me to my fellow-townsmen in January last—

"With all the talk, and with all the effort, which have of late years been expended on the 'elevation and advancement of the masses,' he must be a blind observer, or can have had little opportunity of observing, if the education which the greater proportion of the middle and lower classes of society receives, is, in his estimation, at all sufficient to develop and strengthen either their intellectual or their moral nature. With a little reading, and barely able to write or cipher, the vast majority of them are taken from school at an age when the mind is only becoming capable of appreciating the value of education. With crude and imperfect notions of what moral duty is, or what their relations are to the world around them, they are made to associate with men often more ignorant than themselves, so that the good which was actually in them, is almost sure to be stunted or even blighted in the bud. Untrained to think for themselves, they can of course have but little forethought, and so they early rush into difficulties from which there is no escape, and grow up with minds warped

by prejudice, and easily impressed by the specious but delusive arguments of every unprincipled demagogue. Unarmed for the battle of life, they too readily succumb to the first enemy that crosses their path, and so entail upon their families a heritage of misery. It is not meant to be denied that much has been and is being done in the right direction, and still less is it meant that education (even a religious education) will in every case enable a man to fulfil all the duties of life, for there is natural stupidity as well as natural depravity to be contended against; but there can be no doubt that an intellectual and moral, and with females, a suitable industrial training, carried beyond the education received before leaving school, would prevent much of the wretchedness which has been depicted above. In the deeply to be deplored absence of a national education, what, for example, is to hinder apprentices who, at certain trades, are, during the winter months, done with their work by five in the afternoon, from forming themselves into associations for night schools, and providing themselves with teachers competent to improve them in what they have already got, and to give them what they may still need? Surely a little effort on the part of large employers, would, in this direction, be productive of vast benefit. If it has succeeded to admiration in the case of factory boys and girls in the great manufacturing towns, why should it be otherwise with the young sons of toil in our engineering establishments and ship building yards? Already the supporters of the Greenock School of Art have shown what can be done, though on a higher platform, with those who, during the day, have been employed at handicraft work. It only requires that they, or others with time and ability at their command, should place themselves on a lower level, and try to rescue the immense hordes who, for want of instruction, can never have the energy or self-reliance necessary for the thorough performance of the duties of life, but will inevitably be brought to such a state of degradation as will lead them at last to prey, in some way or other, on the very vitals of society. It is only by such means that the poorer orders of workmen, in the present state of education, are ever likely to see what true economy is, or what their own interests really are, and until such means are actually within their reach, it is vain to look for the Friendly Society taking the place of the mere 'Trades' Union, or for anything like a general observance of the duty of laying up a provision for sickness or old age. But with the intelligence and the industrial and frugal habits which the making of such a provision necessarily implies, as well as the peace of mind which it is sure to produce, it would not be too much to expect that the middle and lower orders would bestow greater care and attention on their children than is at present unfortunately too often the case, and that they would gladly and readily take advantage of the appliances placed at their disposal for both the prevention and mitigation of disease. And when to this is added the completion of such measures as fall to be executed by the authorities, it would not be unreasonable to look for the dawning of the day, when the public will be no longer startled by the appalling fact, that while, as in 1858, the general mortality in the country districts of Scotland was at the rate of 164, and in Scotland generally 205 for every 10,000 persons, it reached, in Greenock, as high a figure as 287, one-half of which was made up of deaths occurring among children below the age of five; or by the fact, still more appalling, that out of an estimated population of about 38,000, there were, in the time of an epidemic, cut off in a single month, as in November last, no fewer than 176 persons, 64 per cent. of whom were children below five years of age."

Greenock, August 30, 1860.