

On the mortality of Edinburgh and Leith, for the year 1848 : with remarks on the mortality prevailing in the chief towns of Scotland during that period / by James Stark.

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ON THE

MORTALITY

OF

EDINBURGH AND LEITH,

FOR

THE YEAR 1848.

WITH REMARKS ON THE MORTALITY PREVAILING IN THE
CHIEF TOWNS OF SCOTLAND
DURING THAT PERIOD.

BY

JAMES STARK, M. D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

PRESENTED
BY THE
AUTHOR

^c
EDINBURGH:
PRINTED BY ROBERT INCHES.

MDCCCXLIX.

OF THE

MONTHLY

EDINBURGH AND LONDON

THE YEAR 1848.

WITH REMARKS ON THE MONTHLY REMOVAL IN THE

CHIEF TOWNS OF SCOTLAND

During that period.

JAMES STARR, M.D.

Author of the Essay on the Influence of the Climate

EDINBURGH:

PRINTED BY ROBERT LEITCH.

1848.

ON THE
MORTALITY OF EDINBURGH, LEITH, &c.

THE mortality of Edinburgh during the year 1848 amounted to 5754,—2759 being males, 2716 females, and 279 still-born. The mortality in Edinburgh during the years 1845, 1846, and 1847 was respectively 3976, 4887, and 7026.

The mortality of Leith during the year 1848 amounted to 1281,—567 being males, 645 females, and 69 still-born. The mortality in Leith during the years 1845, 1846, and 1847 was respectively 544, 868, and 1031.

The mean temperature of the year was 46·73 degrees Fahr., being 0·67 of a degree below the mean temperature of 1847, and 2·67 degrees below the mean temperature of 1846. The annual range of temperature amounted to no less than 77 degrees, 83 being the highest, and 5 the lowest, as marked by the self-registering thermometer in the shade. The mean range of temperature was, however, 1·26 degrees lower than that of 1847. The mean pressure of the atmosphere, as indicated by the barometer, was 29·48 inches, being 0·14 of an inch below the mean barometric pressure in 1847, and 0·30 of an inch below that of 1846. The barometric range during 1848 amounted to 2·29 inches, 30·39 inches being the highest, and 28·10 inches the lowest noted during the year. The quantity of rain which fell amounted to 30·21 inches, being 8·39 inches greater than the fall of rain in 1847, but 0·47 of an inch less than what fell during 1846. West winds blew 138 days; east winds, 101½ days; south winds, 42 days; south-west, 30½ days; north-east, 18; south-east, 14; north-west, 11; and north, 10 days.

The meteorological peculiarities of the year 1848, as compared with 1847, therefore, consist in a lower mean temperature and lower mean range, combined with a greater annual range of temperature; a lower mean barometric pressure, combined with a greater range; an excess of atmospheric moisture, and a much greater fall of rain; a greatly increased prevalence of easterly and of southerly winds, and a marked diminution of northerly winds. For the meteorological peculiarities of each month, reference may be made to the table appended to this report.

If the past year has exhibited peculiarities in its meteorological phenomena, it has not the less shown peculiarities in the diseases which prevailed in Edinburgh and Leith during its continuance. And the prevalence at different periods of the year of typhus fever, of scarlet fever, and of cholera, not only signalize the year as one peculiarly obnoxious to epidemics, but these have tended to increase the mortality of the year much beyond the average of former years.

Being anxious to supply as far as possible the want of a Registration Act for Scotland, and being desirous to ascertain the mortality in the chief towns of Scotland, in order to compare the mortality in them with that occurring in Edinburgh and Leith, some trouble was taken to procure as correct returns as possible from these towns. Bills of mortality are regularly drawn up and published for Glasgow by Mr Patrick, warden of the city burying grounds, under the able superintendence of John Strang, Esq., LL. D., the city chamberlain; for Paisley by the chamberlain, John Lorimer, Esq.; for Dundee by the chamberlain, William B. Baxter, Esq.; and for Greenock by John H. Tuelon, Esq. To these gentlemen, therefore, I am indebted for the mortality returns from these towns. No bills of mortality are prepared for Aberdeen, Perth, or Kilmarnock, but I have been favoured with extracts from the registers kept at the various cemeteries attached to these towns, which serve to give a general idea of the mortality prevailing there. In several other towns no record whatever is kept of the persons buried within their bounds, otherwise the subjoined table would have been more extended. For the mortality returns of the English towns I am indebted to the Registrar-General's Quarterly Reports for the year 1848.

The following table then shows the actual and proportional number of deaths in the several towns mentioned during the years 1845, 1846, 1847, and 1848, and the proportion of deaths in 1848 as compared with the population in 1841. As the year 1845, both in England and Scotland, approached nearer the average mortality than either 1846 or 1847, it is taken as the standard of comparison, and the towns are arranged in the order of least increase in 1848 as compared with that year.

I.—Table showing the proportional mortality of different towns in England and Scotland during the years 1845, 1846, 1847, and 1848 (excluding still-born).

Towns.	Mortality during 1845.	Mortality during 1846.	Mortality during 1847.	Mortality during 1848.	Increase per cent. in 1848 above deaths in 1845.	Ratio per cent. in 1848 with deaths in 1846.	Ratio per cent. in 1848 with deaths in 1847.	Proportion of deaths in 1848 to population of 1841.
1. Wolverhampton, ...	2,091	2,391	3,205	2,435	16·4	+ 1·8	— 31·2	1 in 33·1
2. England and Wales, ...	166,275	192,044	215,094	193,831	16·5	+ 0·9	— 10·9	1 in 34·1
3. London, ...	48,935	49,736	60,442	57,618	17·7	+ 15·7	— 4·9	1 in 33·8
4. Carlisle, ...	752	1,098	1,331	886	17·8	— 23·9	— 50·2	1 in 40·7
5. Manchester, ...	6,022	7,810	9,540	7,255	20·4	— 7·6	— 32·3	1 in 26·5
6. Liverpool, ...	7,371	9,713	17,271	9,442	28·0	— 2·8	— 82·9	1 in 23·6
7. Birmingham, ...	3,604	4,686	5,406	4,655	29·1	— 0·6	— 16·1	1 in 29·6
8. Paisley, ...	1,154	1,429	2,068	1,552	34·4	+ 8·6	— 33·2	1 in 38·9
9. Kilmarnock, ...	399	459	862	539	35·0	+ 17·2	— 53·2	1 in 37·0
10. Edinburgh, ...	3,668	4,594	6,706	5,475	49·2	+ 19·1	— 22·3	1 in 25·6
11. Dundee, ...	1,324	1,531	2,520	2,146	62·0	+ 40·2	— 17·4	1 in 29·2
12. Greenock, ...	788	1,087	2,214	1,289	63·5	+ 18·5	— 71·7	1 in 28·6
13. Glasgow, ...	7,509	10,854	18,081	12,475	66·1	+ 14·9	— 44·8	1 in 21·9
14. Aberdeen, ...	1,217	1,315	1,466	2,366	94·3	+ 79·9	+ 61·3	1 in 26·7
15. Perth, ...	389	505	683	921	136·7	+ 82·3	+ 33·3	1 in 20·9
16. Leith, ...	486	801	955	1,212	149·3	+ 51·3	+ 26·9	1 in 22·7

The + mark indicates that the mortality of 1848 had increased by the per centage noted above that of the year with which it is compared. The — mark that it had fallen below it. Thus the mortality of Paisley in 1848 was 8·6 per cent. *above* that of 1846, but 33·2 per cent. *below* that of 1847.

The above table shows one remarkable fact, and that is, that all the English towns suffered a much smaller increase in their mortality during 1848 above that of the standard year 1845 than any of the towns in Scotland. Thus, while the towns in England exhibited an increase to the extent of from 16 to 29 per cent., Paisley, which stands at the top of the list of the Scottish towns, exhibited an increase of no less than 34 per cent.; the mortality rising through the other towns till it arrives at Leith, in which the in-

crease above 1845 amounted to no less than 149 per cent. But the above table still further shows, that all the English towns without one exception have, during the past year, fallen far below the mortality of the epidemic year 1847; while, on the other hand, in three towns of Scotland, viz. Aberdeen, Perth, and Leith, the mortality of 1848 has considerably exceeded that of 1847. Thus, in Leith the mortality in 1848 was 26 per cent., of Perth 33 per cent., and of Aberdeen no less than 61 per cent. above that of 1847. As the mortality in the English towns was the first to rise, and the first to subside, this observed fact seems to countenance the idea of a mortality wave (if it might be so termed) having passed over the island from south to north; the crest of the wave passing over the south of the island during the second quarter of 1847, reaching this part of the island during the last month of the fourth quarter of 1847, leaving it on the opening of the year 1848, and passing still further north, reached and passed over Aberdeen during the third quarter of 1848. Leith forms no exception to the general idea of this mortality wave, seeing that the greatly-increased mortality there during 1848 was caused by the advent of another mortality wave (the cholera in October) long after the other had left it.

In limiting the comparison, however, to the mortality of different years, we are apt to fall into an error with regard to the real state of healthiness of each town, unless we compare the mortality with the population. For several towns of Scotland there are no means of ascertaining with even an approach to accuracy the existing numbers of the inhabitants, seeing that great changes have occurred in the movements of the population since the taking of the last census, in consequence of the influx of Irish labourers for the railways, &c. This influx, as a deteriorating cause, has more especially affected small towns like Perth, where, to no small extent from this cause, the mortality rose from 389 in 1845, to 921 in 1848. The same cause has vitiated to a certain extent the calculations relative to several of the other towns of Scotland, notably of both Glasgow and Edinburgh; still, as we possess no other data than that furnished by the census of 1841, it must be taken as the basis of any calculations as to the proportion of deaths to the inhabitants. If the towns in the above table were therefore arranged in the order of least mortality among their inhabitants during 1848, as compared with the population of 1841, they would stand in the following order:—

1. Carlisle, one death out of every	40·	4. England & Wales,	34·1
2. Paisley, ...	38·9	5. London, ...	33·8
3. Kilmarnock, ...	37·0	6. Wolverhampton,	33·1
		7. Birmingham, ...	29·6

8. Dundee, one death out of every ...	29·2	12. Edinburgh, ...	25·6
9. Greenock, ...	28·6	13. Liverpool, ...	23·6
10. Aberdeen, ...	26·7	14. Leith, ...	22·7
11. Manchester, ...	26·5	15. Glasgow, ...	21·9
		16. Perth, ...	20·9

The average mortality in Edinburgh for the seven years, 1840 to 1846 inclusive (excluding still-born), amounted to 379 deaths annually, or one death out of every 35·3 inhabitants, according to the census of the population in 1841. During the last year, however, the proportion had increased to one death out of every 25·6 inhabitants; while, in 1847, it reached the frightful proportion of 1 out of every 20·9 of the population. In last year's report it was pointed out that the great increase in the mortality during 1847 arose from the prevalence and fatality of typhus fever among the immigrant Irish and low population of the town,—a disease which attained its height of severity and fatality on the outbreak of influenza in November of that year. The deaths, which in Edinburgh average 12 daily during the winter months, increased to 61 on the 30th of November 1847, and had only fallen to 20 deaths daily when the year 1848 opened. From that period, however, till the outbreak of cholera in October, the number of deaths steadily declined. Thus, during January, the deaths averaged 19·8 daily; during February, 18·6 deaths daily; during March, 15·1 deaths daily; during April, 13·0 deaths daily; during May, 11·7 deaths daily; during June, 11·7 deaths daily; during July, 9·3 deaths daily, or somewhat below the summer average of healthy seasons; during August, 10·0 deaths daily; and during September, 11·6 deaths daily. From the advent of cholera, however, the deaths rapidly increased. Thus, during October they averaged 16·6 daily; during November, 22·9 daily; but during December they again exhibited the tendency to decrease, by averaging only 18·9 deaths daily.

During the past year, the deaths from the zymotic (epidemic, endemic, and contagious) class of diseases amounted in Edinburgh to 2468, or formed 46·92 per cent. of the total mortality. In Leith, the deaths from the same class of diseases numbered 568, forming 46·86 per cent. of the total mortality. In this respect, then, Edinburgh and Leith have maintained an almost perfect uniformity. In 1846, the mortality from the zymotic class of diseases amounted both in Edinburgh and Leith to 24 per cent. of the total mortality; in 1847, however, the mortality therefrom in Edinburgh rose to 39 per cent., and in Leith to 29 per cent. of the total deaths. This great increase in the comparative mortality of the zymotic class of diseases, both in Edinburgh and Leith, during the past year, resulted from the

prevalence in both places of typhus fever, scarlet fever, and cholera.

When the year opened, typhus fever may be said to have been the only prevalent epidemic, inasmuch as influenza was nearly gone, measles very rare, hooping-cough by no means frequent, and scarlet fever not then broken out as an epidemic. During January 1848, the mortality from typhus fever amounted to 209, having fallen from 334, which was the mortality of the same disease in December 1847, when influenza raged. From this date the mortality of typhus fever slowly but steadily declined; the deaths therefrom numbering 201 in February, 128 in March, 102 in April, 67 in May, 52 in June, 41 in July, 42 in August, 24 in September, 31 in October, 26 in November, and 42 in December. One conclusion from these facts seems clearly deducible, and that is, that, though the prevalence and fatality of typhus fever are fearfully aggravated by the presence of that peculiar condition of the air which gives rise to or attends the outbreak of influenza, the same disease does not appear to be at all influenced by the epidemic constitution of the air which gives rise to or attends either scarlet fever or cholera.

During the past year, 965 persons died of typhus fever in Edinburgh, and 127 in Leith, being in the proportion of 17·6 per cent. of the total deaths in Edinburgh, and 10·4 per cent. of the total deaths in Leith. Of the 965 persons dying in Edinburgh, 594 were males, and 371 females; thus showing a numerical preponderance of male cases, in consequence of the influx of Irish labourers to Edinburgh. In Leith, on the other hand, which is not subject to the same influences, the proportion of males and females was almost equal, 64 being males, and 63 females.

In last annual report it was pointed out that the typhus fever which had prevailed in Edinburgh during the greater part of 1847 was an imported disease; and various facts were referred to in proof of this position. It was also stated that from the month of October of that year it had assumed more the type of a regular epidemic. During 1848 it retained this character; and, instead of limiting its attacks to the immigrant Irish, and to the few native Scots with whom they came in contact, it attacked a large proportion of the lowest resident Scottish population. This changed character of the disease is rendered strikingly apparent by noting the varying proportions of Scots and of Irish admitted into the fever wards of the Royal Infirmary at different periods of the years 1847 and 1848, extracted from returns kindly furnished to me by Alex. M'Dougall, Esq., treasurer and superintendent of that valuable institution. Of 473 fever patients in the Royal Infirmary on the 10th of June 1847, no fewer than 379 were natives of Ireland,—but only 87 of Scotland, and 7 of England. On

the 28th of September 1848, of 94 fever cases in that institution, 55 were natives of Scotland, only 35 of Ireland, and 4 of England.

On consulting the old mortality bills of Edinburgh for the last century, I find that the years in which virulent epidemics of fever prevailed were 1741 and 42, 1746, 1751, 1753-4-5 and 6, and then not again with any virulence till 1774 and 1775. After this the mortality from fever remained at a low figure till 1787, when it again broke out, attained its maximum in 1788, but did not very materially abate its ravages till 1793. Since that period Edinburgh remained comparatively free of great epidemics of fever till 1817, when it again broke out, and continued for a period of 3 years. A like epidemic reappeared in 1826, and continued till 1829, also a period of 3 years. Typhus again broke out in 1843, and continued for about the space of one year; and this last epidemic which we have just witnessed broke out in March 1847, and continued till September 1848, a period of 18 months.

In the earlier part of last century the deaths from fever always constituted a large proportion of the annual mortality; and it is a somewhat remarkable fact, as connected with the history of the disease, that the absolute mortality of typhus fever was higher in 1741 and 1742 than during any of the epidemic years, 1788 to 1792 inclusive. This is the more worthy of note, seeing that in these latter years the population was nearly double what it was in 1741; the estimated population being about 40,000 in 1741, and 71,000 in 1790. These old mortality tables, in fact, point out the important fact that, in proportion as the habits of the people improved, in proportion as they lived on better fare and in loftier and better aired houses, and spread over a larger space of ground, typhus fever diminished among them.

A very different tale has to be told relative to the prevalence of typhus fever in Edinburgh during the present century; and it is worthy of inquiry what circumstances have led to the increasing ravages of that disease since 1817. Preliminary to this inquiry, however, it may be interesting to state the relative prevalence of typhus fever in Edinburgh during each of the epidemic periods from 1817 to 1849. The following statement, then, furnished to me by the Treasurer-Superintendent of the Royal Infirmary, shows the number of fever cases admitted into the fever wards during the various epidemics of typhus fever.

	Fever cases admitted	Fever cases.
Nov. 1817 to Nov. 1820, 3 years,	3090—monthly average	83
Nov. 1826 to Nov. 1829, 3 years,	4318	119
Oct. 1836 to Oct. 1839, 3 years,	4850	134
May 1843 to May 1844, 1 year,	4568	380
March 1847 to Sept. 1848, 18 months,	7960	420

From this statement it is at once seen that typhus fever on

every succeeding epidemic is becoming a more formidable and prevalent disease. What is the probable cause of this?

In 1817 the formation of the Union Canal was commenced, and the demand for labourers drew over large numbers from Ireland, many of whose families took up their permanent abode in Edinburgh. This, followed as it was by the building mania, drew over annually large additions of the same class of persons; and it was on their advent that the first severe epidemic of typhus fever, during the present century, made its appearance. At the same time the annual mortality suddenly increased, never afterwards to diminish. Thus, from 1800 to 1810, the mortality in Edinburgh was in the low proportion of one death annually out of every $39\frac{1}{2}$ inhabitants; and, from 1810 to 1820, only one death occurred annually out of every 40 inhabitants. From the advent of these low Irish, however, the mortality has risen slowly and regularly during each decennial period up to the present day; the increase of the Irish, the increase of the general mortality, and the increase of fever, keeping pretty nearly equal pace with each other. The above table shows the increase of fever; and that the general mortality is on the increase, is apparent from the fact that, from 1820 to 1830, there died in Edinburgh one annually out of every 38 inhabitants; from 1830 to 1840 in the proportion of one death annually out of every $34\frac{1}{2}$ inhabitants; while, from 1840 to the present day, such has been the increase in the general mortality that one death has occurred annually out of every $31\frac{1}{2}$ inhabitants.

That this increased general mortality, and increased prevalence and fatality of epidemics of typhus fever, are almost solely to be attributed to the increase of that "great mass of suffering permanently included under the name of the Irish Poor," cannot for a moment be doubted by any one who has had an opportunity of visiting their abodes of wretchedness, overcrowding, and filth. By far the greater portion of the lowest class in Edinburgh is now composed of Irish; and the state of overcrowding, filth, and want of the necessaries of life amid which they live makes it surprising that typhus fever should ever leave their dwellings. Every succeeding year, therefore, calls more loudly for some stringent, but judicious and effectual legislative enactment, by which the sanitary condition of the lower classes may be improved. Every year this is delayed a heavier burden falls on the higher classes for the support of the families rendered destitute by the death or sickness of the parents; and, though an additional tax for carrying out sanitary measures would no doubt be felt somewhat oppressive at first, very few years would elapse before the lessened burdens of the poor's tax would make it apparent to all that the sanitary tax was indeed a real saving of money.

Scarlet fever began to exhibit a tendency to increase as early as the month of January, but the cases were scattered and compara-

tively few till June, when the disease began to assume the epidemic type, and became very prevalent. In Edinburgh the deaths from scarlet fever during June amounted only to 24, in August to 44, and in September to 78. It attained its height during October, when the deaths amounted to 130. From this period the disease began to decline, the deaths falling to 105 in November and to 79 in December. In Leith, again, the mortality from this disease was greatest in December, and next greatest in June and November, during which months the deaths were equal. The total deaths from scarlet fever in Edinburgh during the past year amounted to 530, being in the proportion of 9·6 per cent. of the total mortality, or one death out of every 264 of the population. In Leith the deaths amounted to 159, being in the proportion of 13·1 per cent. of the total mortality, or one death out of every 173 inhabitants. This disease was therefore, in proportion to the population, more prevalent and fatal in Leith than in Edinburgh.

It is a remarkable fact, as connected with the prevalence of scarlet fever, that during every severe epidemic of that disease, it seems to take the place of measles and hooping-cough, which during its continuance remain in more or less complete abeyance. This was remarked to be the case during the autumn and winter of 1835–36, when scarlet fever was last noticed as a ravaging epidemic in Edinburgh, and was strikingly observable during the past year. Scarlet fever differs in one very essential respect from measles and hooping-cough, that it only appears as a prevalent epidemic at rare and distant intervals, its annual mortality in ordinary years from sporadic cases being quite trifling. Thus, in 1846 and 47, during which measles and hooping-cough prevailed, the mortality from this disease was 12 in 1846 and 20 in 1847, a remarkable contrast with the fatality of the disease during the past year. As scarlet fever, however, has been abating during November and December, while measles and hooping-cough are again becoming more prevalent, we may hope that the disease will soon disappear.

Epidemic cholera was the third fatal disease which characterized the year 1848. As connected with this disease, it is necessary to mention, that within the limits of the Edinburgh and Leith Mortality Bills are included the fishing village of Newhaven, on the shores of the Frith of Forth, and the small village of Restalrig, situated in the midst of irrigated meadows.

Cholera broke out nearly simultaneously at Newhaven and Edinburgh, the first case occurring at Newhaven on the 1st of October, the first cases in Edinburgh on the 2d of the same month. On the 9th of October the disease appeared at Leith, but Restalrig had wholly escaped the disease when the year closed. At Newhaven the disease may be said to have terminated on the 28th of October,—after exactly a lunar month's continuance. At

Leith it terminated on the 2d of December, or almost exactly two lunar months after its outbreak; while in Edinburgh the disease continued, though the cases were few, when the year closed.

Only one case of cholera occurred at the small village of Restalrig in 1832; and as the disease had disappeared from all the surrounding villages without any of the inhabitants being seized, it seemed likely to escape the visitation altogether. On the 15th of January 1849, however, the disease suddenly broke out in that village, and within the space of three weeks seized about 30 persons, of whom 17 died. The population there does not exceed 150 souls, so that it gives the large proportion of one attacked out of every 5 persons, or one death out of every 9 of the population,—the largest proportion of which we have yet heard.

This is the second great epidemic of cholera in Edinburgh during the present century,—the first being in 1832. It is not to be supposed, however, that cholera has never been here since 1832. In the autumn and winter of 1833–34 we had another threatened outbreak, when many cases occurred, and a large proportion proved fatal. During the epidemic of 1833–34, the cases were almost entirely confined to the lowest class of the population; and what was worthy of remark was, that, while the persons living on the ground and attic floors were attacked, it almost invariably happened that those living in the intermediate floors escaped.

In 1832 cholera broke out in Edinburgh on the last week of January, and continued till the end of the first week of December. The following is the statement of the deaths during each of the months of that year, extracted from the Mortality Records:—

January,	2	August,	100
February,	9	September,	154
March,	58	October,	255
April,	145	November,	30
May,	85	December,	6
June,	62		
July,	154	Total,	1060

In 1832 the most efficient means were used by the Board of Health for the registration of every case, and it is generally believed that every case was registered. The Board reported 1062 deaths from cholera, and, as it is not possible now to ascertain how many were removed for burial beyond the bounds of Edinburgh, the fact of the numbers extracted from the Mortality Records corresponding so closely with those reported by the Board of Health, goes far to prove the general accuracy of these registers.

Having in last report (for September, October, and November 1848) noticed the chief peculiarities relative to the cholera as it appeared here, it seems unnecessary to repeat what was there stated. Edinburgh and the village of Loanhead presented some

peculiarities or anomalies in the form of cholera which prevailed there, not noticed at Newhaven, Restalrig, Dumfries, or Glasgow. In all these latter places, while cholera was raging, cases of diarrhœa were extremely numerous, and when neglected many passed into cholera; and every case of cholera had the premonitory diarrhœa. Thus, at Newhaven, when cholera raged there, almost every inhabitant of the village suffered more or less from severe bowel complaint. The same occurred at Restalrig, Dumfries, and Glasgow; and numerous as were the cases of cholera, those of diarrhœa were many times more numerous. In Edinburgh, when cholera first broke out, diarrhœa was somewhat prevalent, and almost every case had premonitory diarrhœa; but after a short time diarrhœa became no more common than is usual during October, and those attacked with cholera were struck down suddenly with the disease, having had no premonitory diarrhœa. Such also was for the most part the case with those attacked at Loanhead,—a cleanly, well-aired village in a high and dry situation, about five miles to the south of Edinburgh, and containing about 1200 inhabitants, almost all in comfortable circumstances and comfortably lodged.

In Edinburgh, Leith, and Newhaven, the cases of cholera for the most part occurred in those districts of the town which were in the worst sanitary condition as to crowding, ventilation, and cleanliness; and at Restalrig the circumstance of the village being surrounded by meadows, irrigated with the foul water of Edinburgh, may perhaps have had some effect in rendering the inhabitants there more prone to diarrhœa and cholera. At Loanhead, however, everything was the reverse of this. The inhabitants first attacked, indeed the majority of the cases occurred in persons in comfortable circumstances, living in the best and newest houses, which, as to cleanliness, &c. were unexceptionable in a sanitary point of view. Yet cholera broke out among them most unexpectedly and virulently, and within six weeks from the 3d of November 61 cases had occurred, of which 46 proved fatal. This gives 1 case out of every 19 inhabitants, and 1 death out of every 27 inhabitants. After the disease had apparently exhausted its virulence on the inhabitants in the better part of the village, it extended its ravages to those living in the poorer parts, where, however, it limited its ravages chiefly to the dissipated, who lived in dwellings much in need of purification. At Loanhead, as at Newhaven, the attack of cholera as an epidemic was limited to one month from its outbreak. It broke out on the 3d of November, and ended on the 2d of December. One case occurred a fortnight afterwards, and again in the neighbourhood of the village about a month after that again, but the cases then were unquestionably cases of the communication of the disease by contagion. It has always been remarked, as one of the peculiarities

of cholera, that the dissipated were its especial victims; and this circumstance may perhaps so far explain the attacks at Loanhead. The inhabitants are generally dissipated, and many very irregular in their habits, and it was among these chiefly that the disease occurred. Nevertheless, this will not altogether explain the occurrences there, seeing that instances occurred where the more sober wife was cut off, while the drunkard husband escaped. This, however, was one of the peculiarities of the disease, to attack females in preference to and in greater numbers than males. For these and many other important particulars relative to the cholera at Loanhead, I am indebted to the Rev. William Anderson of Loanhead, who, in the discharge of his ministerial duties, attended almost every case.

Though cholera, when it first broke out, did not in general manifest itself as a contagious disease, it certainly did so in several unquestionable instances later in the epidemic. Several very marked and striking instances of this occurred both in Edinburgh and near Loanhead, after the disease was dragging out a languishing existence in Edinburgh, and had ceased for weeks at Loanhead. Individuals and families flying from the cholera in Dumfries and Glasgow, after one of the members of the family had died of the disease, took up their abode in Edinburgh and near Loanhead, and communicated the disease to those with whom they lodged, though at the moment none of the fugitives were labouring under the disease.

During the former epidemic of cholera, it was remarked by many physicians in different parts of Europe that, during its continuance, the mortality from all other diseases was greatly diminished. I know not whether these statements were founded on actual statistical returns,—if not, they are of no value. This, however, is certain, that in Edinburgh, during the former epidemic, and in Edinburgh, Leith, and Glasgow, during the present epidemic, the general mortality of all diseases, instead of being lower, has been above the average during the continuance of the epidemic. Thus, the average annual number of deaths in Edinburgh for the three years preceding the outbreak of cholera in 1832, was 3465 deaths. During the year when cholera prevailed they rose to 5262 deaths, only 1062 of which were attributable to cholera, leaving an excess in the general mortality of all other diseases to the extent of 735 deaths. In Leith, during the past year, during the two months when cholera prevailed, the mortality from the ordinary diseases was quite excessive. Thus, during October and November of the standard year 1845, the whole mortality amounted to 87 deaths; during October and November 1848, whilst cholera prevailed, the total mortality amounted to 396 deaths, of which only 181 were attributable to cholera; leaving an excess of 128 deaths over the total mortality of Octo-

ber and November 1845. In Edinburgh the total mortality during October, November, and December, of the standard year 1845, amounted to 981 deaths; during the corresponding months of 1848, while cholera prevailed, the total deaths amounted to 1790; of these only 366 were attributable to cholera, leaving during these three months an excess of 443 deaths above the mortality of the corresponding months of the standard year 1845. The same fact is proved if we view the subject in another light. Before cholera appeared, the mortality in Edinburgh was falling to the low standard of 1845. Thus, the deaths from the ordinary diseases, excluding the whole zymotic class, averaged 6.6 daily during July, 6.2 daily during August, and 6.6 daily during September; but, on the outbreak of cholera in October they rose to 7.2 daily, during November to 9.6 daily, and during December to 7.4 daily. The same was true of Glasgow. During November and December, when cholera raged, the total mortality amounted to 3374 deaths, of which number 1420 were attributable to cholera, leaving 1954 deaths from ordinary causes. If we deduct the aggregate total mortality of the two previous months, it will leave an excess of deaths from ordinary causes, during the months when cholera prevailed, of 447; even allowing 100 additional deaths during December, the excess of deaths from ordinary causes will, during the cholera period, amount to 347. As the very same facts were noticed, even to a more striking extent, during the continuance of epidemic typhus fever last year, it may be regarded as established, that the mortality from these great epidemics is superadded to the general mortality, which, during their continuance, is also increased—not diminished, as heretofore was very generally believed. On the other hand, these great epidemics appear to render those who recover from them more liable to be affected afterwards with the ordinary diseases; and thus the general mortality is kept above its natural standard for months even after the pestilence has entirely ceased its ravages. Thus, in 1833 the mortality in Edinburgh was still 800 above its natural standard, though cholera had ceased the year previous. And many similar facts might be quoted. Every effort should therefore be made to arrest the progress of these epidemic diseases, which seem every day to be more and more on the increase.

These three diseases, then, typhus fever, scarlet fever, and cholera, were the chief agents in raising the mortality of the past year so much beyond the average mortality of former years. It is to be hoped that the epidemic period has now passed from us, and that Edinburgh will revert to its pristine healthfulness.

Of the other epidemic diseases, small-pox cut off 96 in Edinburgh during the past year, of which number 8 were reported to have been previously vaccinated, and 88 not protected by vaccination. Only 5 deaths from the same disease occurred in Leith

during the past year, all unvaccinated. The deaths from this disease, before the introduction of vaccination, always constituted in Edinburgh a large per centage of the mortality, almost always equalling the combined mortality of measles and hooping-cough. Thus, from 1740 to 1750, the deaths from small-pox constituted nearly 14 per cent. of the total mortality; from 1750 to 1760 it was 9 per cent. of the total deaths; 11 per cent. from 1760 to 1770; 12 per cent. from 1770 to 1780; 14 per cent. from 1780 to 1790; and 12 per cent. from 1790 to 1800, when vaccination was introduced. Immediately on the introduction and general adoption of vaccination, the proportional number of deaths from small-pox fell, so that from 1800 to 1810, the mortality from that disease formed only $3\frac{1}{2}$ per cent. of the total deaths, and the proportion continued to sink lower and lower, so long as the greater proportion of those born were vaccinated. Thus, from 1810 to 1820, the deaths from small-pox formed only 1.5 per cent. of the total deaths; and from 1820 to 1830 were so low as 1.2 per cent. From that date, in consequence of the general neglect of vaccination among the lower classes, the deaths from small-pox have been on the increase. Thus, from 1830 to 1840, they formed 1.9 per cent. of the total deaths, and from 1840 to 1849, they have increased to 2 per cent.; and a rather virulent epidemic of small-pox is at this moment raging among us.

Measles and hooping-cough, the diseases usually prevalent among children, in ordinary years cut off from 300 to 400 children annually. During the past year, however, these two diseases together proved fatal to only 149 children; the majority of the cases occurring before the outbreak of scarlatina, and after that disease began to decline.

During the present century the proportional mortality of measles has greatly diminished, notwithstanding that it is the general belief that the arrestment of small-pox by vaccination allowed a larger proportion of children to become the victims of measles, scarlet fever, and hooping-cough, and consequently that the mortality from these diseases was greater than before the introduction of vaccination. To ascertain this point, the deaths from measles in Edinburgh during a portion of last century were extracted from the Bills of Mortality, and the following is the result. From 1740 to 1750 the mortality of measles was 5.6 per cent. of the total deaths. From 1750 to 1760 it was 6.1 per cent. From 1760 to 1770 it was only 2.3 per cent.; and from 1770 to 1780 it was 11.8 per cent. During the present century, we have only correct tables of the diseases in Edinburgh drawn up from 1839 to 41 inclusive, and from 1846 to 48 inclusive. During the first of these periods the deaths from measles formed 2.9 per cent. of the total mortality; while from 1846 to 1848 inclusive, they formed 2.6 per cent. of the total deaths. From these simple

statements may be inferred the benefits which vaccination has conferred on the community, inasmuch as the almost complete arrestment of a disease which annually cut off 12 per cent. of all persons dying in Edinburgh, has not tended to increase the fatality of other diseases.

Hooping-cough during the past year proved fatal to only 94 children in Edinburgh, and 22 in Leith, 45 of these being males, and 71 females. This disease, though its proportionate mortality has somewhat decreased during the present century, has more nearly than measles retained the average it had during the past century. Thus, from 1740 to 1750, hooping-cough constituted 5·8 per cent. of the total deaths; from 1750 to 1760 the proportion was 4·9 per cent.; from 1760 to 1770 it was 4 per cent.; from 1770 to 1780 it was 4·8 per cent.; and from 1780 to 1790 the deaths from hooping-cough amounted to 4·2 per cent. of the total deaths. During the past three years, the deaths from the same diseases have formed only 3·7 per cent. of the total deaths.

Croup proved fatal to 51 persons in Edinburgh, and to 18 in Leith, during the past year—34 being males, and 35 females. This disease has therefore been much less prevalent in Edinburgh, but more prevalent in Leith during the past year, than in 1847. In 1847, the deaths from croup amounted in Edinburgh to 89, so that 37 fewer have died of the disease during the past year.

Ague proved fatal to two individuals during the past year, both reported to have contracted the disease abroad. However rare ague now is in Edinburgh, it was at one time one of the regular endemic diseases, not a year passing over without its cutting off several victims. Before the drainage of Hope Park (formerly a shallow lake or marsh), in the year 1722, often so many as 30 deaths in a year occurred from ague; and even so late as 1752, the year before the improvements under the auspices of Provost Drummond began, no fewer than 14 died from this disease. The deaths from ague gradually fell after this year to the year 1762, when four died of this disease; and the drainage of the North Loch the next year, though not very perfectly done, may be said to have put an end to the disease in Edinburgh. Cases of ague, however, now and then occurred after this, both in the neighbourhood of the North Loch and of Hope Park; but from the drainage of the North Loch in 1763, till the end of the century, only 10 deaths are recorded as being caused by ague.

In taking a general view, then, of the mortality from epidemic and endemic diseases in Edinburgh during the past and present centuries, we at once see how much has been effected by improvements in the dwellings, drainage, and modes of living of the inhabitants. And if we now see that, since the advent of the low Irish and their increase among us, typhus fever and other epidemics are on the increase, we have only to look back to the end

of last century, and commencement of this, to satisfy ourselves how much may be done for their arrestment, by following out sanitary improvements. It is true, that the measures now needed would require to be somewhat different from those in former times; but it is to be feared that nothing will be found effectual till a stop is put to the now regular immigration and settlement of the low Irish in all our towns.

Diseases of the brain cut off fewer persons during the past year than during either 1846 or 1847. The mortality of this class of diseases amounted to 482 in 1846, to 516 in 1847, but only to 382 in 1848. Of these diseases, hydrocephalus was the most fatal during 1848, cutting off 113 persons, 59 being males and 54 females; 62 died from apoplexy in Edinburgh, 44 males and 18 females,—a much larger proportion of males than during either 1846 or 1847; 93 deaths were ascribed to paralysis, 43 being males and 50 females.

The mortality of diseases of the respiratory organs has been greatly less during the past year than during either of the previous years. Bronchitis and pneumonia have been much less prevalent during 1848 than during either 1846 or 1847. These diseases attained their maximum mortality during the year 1847, when scurvy and influenza were prevalent; indeed, these diseases appeared to aggravate the mortality of all diseases of the respiratory organs. Thus, during 1848 the deaths from bronchitis amounted to 16, from pneumonia to 126, from asthma to 66, and from consumption to 533; whereas during the year 1847 the deaths from these diseases were respectively 113, 246, 118, and 799.

By the old mortality bills of Edinburgh we learn that consumption was a much more fatal disease during the last century than it is at the present day. This may be easily accounted for. Then the town was confined to that portion now termed the "Old Town," with its crowded and very narrow streets and lanes, its towering houses, its confined and ill-ventilated apartments, its complete want of drainage, and the want of innumerable comforts and conveniences which all ranks now enjoy. Thus, from 1740 to 1750, consumption cut off annually 19·3 per cent. of all persons dying in Edinburgh. From 1750 to 1760 it constituted 19·1 per cent. of the total mortality. From 1760 to 1770 it constituted 20·7 per cent. of the total deaths; 27 per cent. from 1770 to 1780; and 26·4 per cent. of all persons dying in Edinburgh from 1780 to 1790. During the past three years, 1846, 1847, 1848, the proportion of deaths from consumption has been only 11·7 per cent. of the total deaths in Edinburgh, and so low as 9·9 per cent. in Leith. If again we take the proportion of the population cut off annually by this disease during the past and present centuries, we shall arrive at the same conclusion as to the excessive prevalence of the disease during the past century, as

compared with what it now is. Thus, according to the corrected returns of the population for the past century, consumption in Edinburgh from 1780 to 1790 proved fatal to 1 annually out of every 125 of the population, whereas, notwithstanding the excessive fatality of this disease here during 1847, there died in Edinburgh during the last 3 years at the rate of 1 annually out of every 213 inhabitants. In other words, the deaths from consumption during the last 3 years were 78 per cent. fewer in Edinburgh than during the latter part of the last century. In Leith again, during the last 3 years the deaths from consumption were so low as 1 annually out of every 280 inhabitants. The above facts, taken in connection with the diminished mortality from epidemic diseases, proves in a very satisfactory manner the great improvement in the public health, which has resulted, not from the advancement of medical science, but from the increasing comforts in food, clothing, habitations, &c., which result from the progress of civilization. In proportion to our progress in civilization and departure from a state of rude barbarism, plagues diminished, then ceased; and the mortality from epidemic diseases and consumption fell lower and lower,—almost holding out the hope that, should we succeed in advancing in civilization, and effecting those sanitary improvements which the enlightenment of the age shows to be necessary, we should succeed in still further controlling these fatal maladies.

The mortality from diseases of the heart and blood-vessels was lower during last year than during either of the two preceding years, amounting to 85 only; whereas it amounted to 100 in 1846, and to 114 in 1847. In Leith the mortality of heart disease, &c. was exactly the same in amount as in 1846, viz. 14 deaths; whereas in 1847 the number of deaths amounted to 27.

Diseases of the organs of digestion, excluding the epidemic and endemic bowel complaints, amounted in Edinburgh to 562 during the past year, being 36 fewer than in 1847, but 69 more than in 1846. The deaths from inflammation of the stomach and bowels amounted to 246 in 1848; whereas in 1847 they were 206, and in 1846 only 120. The increased tendency to bowel complaints which prevailed in 1848 sufficiently accounts for the above increase.

One of the most remarkable facts connected with the mortality of the past year, is the great decrease in the number of deaths registered in Edinburgh under the head of old age. In 1846, 540 deaths were registered under that head; 617 in 1847; but only 367 in 1848. That this great decrease was not caused by the aged being cut off by other diseases, and being consequently registered under another head, is proved by the fact, that fewer persons above 60 years of age died during 1848 than during either 1846 or 1847. Thus, in 1846 there died 943 persons above 60 years of age, in 1847 no fewer than 1259 persons, but

in 1848 only 750 persons. This diminished mortality of the aged during the past year may have arisen from two causes: 1st, That influenza in 1847 cut off in especial the aged, and among them many who in ordinary seasons would have survived a year or two. 2d, That the greater uniformity of temperature during 1848, more especially the less sudden changes of temperature during the latter half of the year, the lower barometric pressure, and moderate moisture of the atmosphere, during all which states it has been observed that the mortality among the aged is diminished, may have contributed to produce this result.

Having thus noted the leading diseases which prevailed during the past year, a few remarks may be appended on the proportion of persons dying at different ages during the past and present centuries, as this will exhibit in a striking point of view the improvement which has been effected in the public health during the present century.

It is a known fact, that in an unhealthy town or locality the infantile mortality bears a much larger proportion to the total deaths than in a healthy one. It may, therefore, be stated as a general rule, that the less the proportion of deaths among children under 5 years, the greater is the healthiness of the town or locality. Numerous instances proving this might be adduced. Thus, while over England and Wales the proportion of deaths among children under 5 years of age is, on an average of several years, about 36 out of the 100 deaths at all ages,—the proportion rises to 47 in Glasgow and Birmingham, to 49 in Manchester, and to 52, out of the 100 deaths at all ages, in Liverpool, one of the most unhealthy towns in Britain. The following table then exhibits the per centage of deaths in Edinburgh at different ages during two periods of last and two periods of the present centuries.

Ages.	1740 to 1750	1780 to 1790	1839, 40, 41	1846, 47, 48
Under 2 years,	35.2	33.4	25.0	24.4
2 to 5 years,	12.2	11.6	8.5	8.1
Total under 5 years,	47.4	45.0	33.6	32.5
5 to 10 years,	4.3	5.9	5.1	4.6
10 to 20 years,	4.1	5.0	5.1	5.8
20 to 60 years,	29.8	26.1	35.6	39.3
Above 60 years,	14.2	17.6	20.4	17.6

From the above table it is at once apparent that infantile mortality has been much less during the present than it was during the past century; for while of 1000 persons born from 1740 to 1750, no less than 352 died before they attained their 2d year, only 244 died under the same age from 1846 to 1849. The same fact is evidenced by taking the proportion of all those dying

under 5 years of age. A century ago, very nearly a half, or 474 out of every 1000, died before they attained their 5th year; whereas during the last few years the 30th year of life is attained before an equal number are cut off, and only 325 out of every 1000 born are cut off before they attain their 5th year. In fact, Edinburgh a century ago was just about as unhealthy as Liverpool now is. As a natural consequence of the lessened mortality in infancy and childhood during the present century, more are spared to die in manhood and old age; consequently, between the ages of 20 and 60 years, instead of the mortality being in the proportion of from 261 to 298 deaths out of every 1000 deaths at all ages, as it was last century, the mortality at the same ages during the present century reaches the large proportion of from 356 to 393 out of the 1000 deaths at all ages.

A few remarks will now be made on the mortality of the other towns in Scotland, from which returns have been received.

The returns from Glasgow, Paisley, Dundee, and Greenock, specify the diseases as well as the sex and age of all persons dying in these towns during the year 1848. Some of the Aberdeen returns, but not the whole, specify the same facts; while from Kilmarnock and Perth, the returns are confined to the numbers of males, females, and still-born. The following tables exhibit, at a glance, the numbers dying at different ages in the towns of Glasgow, Paisley, Dundee, and Greenock, during the year 1848; also the numbers cut off by a few of the more prevalent and fatal diseases in these towns.

Table of Ages for 1848.

Ages.	Glasgow.			Paisley.			Dundee.			Greenock.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
Under 1 year	940	789	1729	86	93	179	171	102	273	101	77	178
1 & under 2	618	549	1167	68	75	143	100	89	189	45	48	93
2 ... 5	828	666	1494	107	88	195	202	161	363	49	48	97
5 ... 10	477	365	842	68	52	120	102	97	199	37	28	65
10 ... 15	169	168	337	28	21	49	70	73	143	19	9	28
15 ... 20	249	245	494	29	35	64				26	27	53
20 ... 30	645	690	1335	61	47	108	66	90	156	65	69	134
30 ... 40	630	656	1286	48	65	113	67	92	159	71	58	129
40 ... 50	644	599	1243	69	74	143	92	97	189	84	66	150
50 ... 60	492	419	911	52	52	104	72	77	149	57	54	111
60 ... 70	365	419	784	67	59	126	65	72	137	42	45	87
70 ... 80	301	301	602	47	71	118	40	54	94	39	36	75
80 ... 90	93	132	225	18	25	43	26	40	66	10	26	36
90 and upwards	8	18	26	0	4	4	0	2	2	0	0	0
Not specified	...	..	...	21	22	43	...	...	...	25	28	53
TOTAL DEATHS	6459	6016	12475	778	774	1552	1073	1046	2119	670	619	1289
Still-born	416	288	704	50	28	78	57	45	102	...	...	65
TOTAL	6875	6304	13179	828	802	1630	1130	1091	2221	...	.	1354

The tables of ages for the above towns will be rendered more easily comparable with one another, and with that already given for Edinburgh, if the mortality at each age be reduced to the proportion it bears to the 100 deaths at all ages. The following table, then, exhibits the proportional deaths at each age, to the 100 deaths at all ages during the year 1848 :—

Ages.	Glasgow.	Paisley.	Dundee.	Greenock.
Under 2 years,	23·2 p. cent.	21·3 p. cent.	21·8 p. cent.	21·9 p. cent.
2 to 5 years,	11·9	12·8	16·6	7·8
Total under 5 years,	35·1	34·1	38·4	29·7
5 to 10 years,	6·7	7·9	9·3	5·2
10 to 20 years,	6·6	7·4	6·7	6·5
20 to 60 years,	88·2	31·0	30·8	42·4
Above 60 years,	13·1	19·2	14·1	15·2

The above table shows that infant mortality under two years of age was higher in Glasgow than in any of the other towns, amounting to 23·2 children out of every 100 persons dying at all ages. Children between the ages of two and five years died during the last year in a greater proportion at Dundee than in any other of the above towns, while the mortality among children of the same age was least in Greenock, the proportion not being half so great as at Dundee. It will be afterwards shown, that this great excess of deaths at Dundee, of children between the ages of two and five, was caused by the excessive prevalence in that town of scarlet fever. In consequence of this excessive mortality between the ages of two and five years at Dundee, the proportional mortality of children under five years of age was higher at Dundee than any of the other of the above towns, the deaths under five years of age being in the proportion of 38·4 to the 100 deaths in all ages. Glasgow was next highest, the mortality under five years of age being in the proportion of 35·1 to the 100 deaths at all ages, while the mortality in Paisley was 34·1, and in Greenock 29·7 per cent. only. The proportion dying between the ages of 20 and 60 years was highest in Greenock, where the infantile mortality was lowest, amounting to 42·4 per cent. of the total deaths; and lowest in Dundee, where the infantile mortality was highest, amounting there to 30·8 per cent. of the total deaths. The proportion of deaths above 10 was highest in Paisley, and lowest in Glasgow.

Table of principal Diseases—1848.

Diseases.	Glasgow.			Paisley.			Dundee.			Greenock.		
	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.	M.	F.	Tot.
Aged,	383	492	875	85	120	205	53	88	141	46	63	109
Asthma,	115	133	248	3	12	15	26	25	51	7	13	20
Bowel complaints, ...	643	594	1237	107	67	174	98	66	164	53	65	118
Brain disease,	347	248	595	35	31	66	89	67	156	19	11	30
Cholera,	666	754	1420	1	2	3	2	1	3	2	1	3
Consumption, decline,	1104	1007	2111	146	150	296	107	111	218	83	107	190
Dropsy,	161	174	335	22	23	45	37	55	92	10	15	25
Hooping-cough,	153	177	330	20	23	43	22	13	35	8	8	16
Measles,	177	145	322	27	12	39	41	39	80	2	2	4
Scarlet fever,	251	223	474	31	47	78	164	144	308	2	0	2
Small-pox,	167	133	300	27	23	50	47	44	91	12	11	23
Typhus fever,	773	614	1387	117	97	214	175	181	356	197	147	344

The above tables of diseases show that, during the past year, Glasgow, Paisley, and Dundee have been overrun by the same epidemic diseases as Edinburgh,—cholera excepted, which had just made its appearance in Paisley and Dundee when the year closed. Greenock, on the other hand, appears to have been under very different influences from most other towns of Scotland, and to have almost quite escaped the ravages of these diseases. Thus, scarlet fever, which has been very prevalent and fatal at Aberdeen, Edinburgh, Leith, Glasgow, Paisley, and Dundee, has passed over Greenock altogether. In these towns, however, the fatality of that disease has varied greatly. From the partial returns of diseases received from Aberdeen, the mortality from scarlet fever appears to have been very high. At Dundee the mortality of scarlet fever amounted to 14·5 per cent. of the total mortality, in Leith to 13·1 per cent., in Edinburgh to 9·6 per cent., in Paisley to 5 per cent., and in Glasgow to 3·7 per cent. of the total deaths.

If Greenock suffered least from scarlet fever during the past year, it suffered most from typhus fever, the mortality therefrom exceeding a fourth of the total deaths, being in the proportion of 26·6 per cent. of the total deaths. In Edinburgh the proportion of deaths from this disease was 17·6 per cent.; in Dundee, 16·7 per cent.; in Paisley, 13·7 per cent.; in Glasgow, 11·1 per cent.; and in Leith, only 10·4 per cent.

The mortality of small-pox, which formed a scarcely calculable fraction of the total mortality in Leith, was so high as 4·2 per cent. of the total deaths in Dundee during the year 1848; 3·2 per cent. of the deaths in Paisley; 2·3 per cent. in Glasgow; 1·7 per cent. in Greenock; and 1·6 per cent. in Edinburgh.

Greenock, which escaped the ravages of scarlet fever, was nearly equally fortunate in respect of measles. In no town of Scotland has the mortality of measles been high during the year, excepting perhaps Dundee, where the deaths from measles amounted to 3·7 per cent. of the total deaths. In Glasgow and Paisley they were only 2·5 per cent., in Edinburgh 1·0 per cent., and in Leith so low as 7-10ths of a per centage.

The mortality of hooping-cough has been unusually low in every town during the past year. In Paisley the deaths from hooping-cough amounted to 2·7 per cent. of the total mortality; in Glasgow to 2·6 per cent., in Leith to 1·8 per cent., in Edinburgh to 1·7 per cent., in Dundee to 1·6 per cent., and in Greenock they were as low as 1·2 per cent. of the total deaths.

Probably, in consequence of the exceeding prevalence of scarlet fever in Dundee, and its frequent consecutive dropsy, the mortality from dropsy, instead of only amounting to 2·6 per cent. of the total deaths, as in Edinburgh and Glasgow, was as high as 4·3 per cent. In Paisley the mortality of dropsy amounted to 2·8 per cent., in Greenock to 1·9 per cent. while in Leith it was as low as 1·1 per cent. of the total deaths.

Cholera, when the year closed, had just made its appearance at Dundee, Paisley, and Greenock. In Glasgow, however, it had been raging for about 7 weeks, and was very prevalent and fatal when the year closed—indeed, it had not then attained its acmé. At the close of the year it had cut off 1420 persons, and formed no less than 11·3 per cent. of the year's mortality. In Edinburgh it formed 8·7 per cent., and in Leith 15·2 per cent. of the total deaths of the year. In Glasgow, as in Edinburgh and Leith, females were cut off by cholera in larger numbers than males. Of the 1420 deaths, 666 were males and 754 females.

The cholera in Glasgow was almost invariably attended with premonitory diarrhœa; and during the whole course of the epidemic, common diarrhœa and rice water purgings were exceedingly general. Even when the disease was on the decline, the same fact was noticed. Thus, there were reported to the Board of Health from the 29th to the 31st of January 1849, 141 cases of cholera, and 609 cases of diarrhœa in 37 of which were rice water purgings. From the 1st to the 4th of February 1849, there were reported 141 cases of cholera, and 576 cases of diarrhœa in 30 of which rice water purgings occurred. It was when the disease showed this tendency to commence by diarrhœa, that the house-to-house daily visitation, and the correcting this premonitory diarrhœa, seemed, in the estimation of many, to be so efficacious in moderating the virulence of the disease.

That these measures had this effect does not appear to rest on sufficiently satisfactory data, seeing that the gradual subsidence of the disease may have depended as much on the natural progress of the malady as on the preventive and remedial measures employed. Thus, the house-to-house visitation in Glasgow was

commenced in the early part of the Christmas week, when the number of cases, as reported by the Board of Health, numbered 87 on the Monday and 84 on the Tuesday of that week; yet the number of cases increased daily from that date up to the 5th of January, on which day 239 cases were reported. Even on the 9th of January the cases of cholera numbered 163, or were double the number they had been when the house-to-house visitation was commenced, and after it had been in full operation for nearly a fortnight! That this practice saved some lives seems undoubted; but the facts by no means warrant the assertion that the disease was thereby materially arrested.

In confirmation of the opinion advanced, that the subsidence of the cholera in Dumfries and in Glasgow was owing to the natural progress of the malady, and not to the preventive measures employed, the following facts may be adduced. In all places in Scotland from which I have been able to procure special returns, when cholera was severe it either confined its ravages within a month, or if it continued with any degree of severity beyond that period, it attained a maximum or maxima of severity, at the end of every monthly period from the date of its outbreak until it reached its acmé, and generally terminated at the end of a monthly period. In fact, this disease appeared to be as much under monthly influence as the menstrual function in women.

In Edinburgh the cholera attained its maximum of severity first on the completion of the 4th week from its first appearance; and secondly, it attained a second maximum on the completion of the 8th week from its outbreak. It appeared in Edinburgh on the 2d of October, and attained its first maximum on the 28th of the same month, on which day 20 cases were reported. After this it gradually declined till the 29th day of November, on which day 6 cases were reported, this number being the daily average of the previous week. On the 30th, however, the cases again rose suddenly to 18, thus constituting the second maximum which the disease attained here. In Edinburgh, it is to be borne in mind that, as the cholera was not in general attended with premonitory diarrhœa, house-to-house visitation was uncalled for. The disease was allowed to progress or abate unchecked. The phenomena, therefore, regarding its attaining a maximum of intensity on any particular day, may be regarded as the natural phasis of the disease.

In Leith the same phenomenon was observed. Cholera broke out there on the 9th of October, and attained its maximum on the 6th of November, exactly a lunar month after its outbreak, when the cases numbered 18. On the 9th of November, however, exactly a calendar month from its first appearance, the cases numbered 19, or one more than on the 6th. The disease wholly disappeared just before the completion of the 8th week from its outbreak.

At Loanhead cholera broke out on the 3d of November, and ceased as an epidemic within one month from its outbreak. The disease in this village was very severe.

At Newhaven cholera broke out on the 1st of October, and the last case occurred on the 28th of the same month,—exactly a lunar month after its appearance. Here also the disease was very severe.

In Glasgow a similar aggravation of the disease was observed at much the same periods from its outbreak. Cholera first appeared in Glasgow on Sunday the 12th of November, and the disease maintained a languishing existence till the 11th of December, on which day only 3 cases were reported. On the 12th of December the cases rose to 11, and the next day to 22. Here the first maximum was attained just one calendar month from its outbreak. After this the disease rapidly extended; and, notwithstanding every effort which human skill could devise for its arrestment, steadily advanced till it attained its second and real maximum on the 5th of January 1849, almost exactly two lunar months from its outbreak.

As far as I have been able to learn regarding the progress of the cholera at Restalrig and Coatbridge, it appears to have confined its ravages within the month from its outbreak.

At Kelso the first case of cholera occurred on the 27th, the second on the 30th of November, but cases did not occur continuously till the end of the first week of December. The first maximum of the disease was attained on the 2d of January, when 12 cases were reported; the second maximum was reached on the 28th of the same month, when 10 cases occurred.

At Dumfries cholera attained its maximum on the 11th of December, when 38 cases were reported, as nearly as I can learn within a lunar month from the occurrence of the first case. The disease wholly terminated within two lunar months from its outbreak; the last case, so far as I have been able to learn, having occurred on the 10th or 11th of January 1849.

In almost all these cases, then, we see that the cholera, in its duration and accesses, has maintained a certain periodicity; and if we find that in some cases that period has been a day or two before the exact lunar month, or a day or two behind it, it is no greater deviation than what is every day observed with the menstrual function in women. Can this peculiar phasis of the disease have had any thing to do with the observed greater prevalence and mortality of cholera among women? (See Report for September, October, and November 1848).

In making these remarks, it is not intended to throw any disparagement on the excellent preventive measures adopted in Glasgow and Dumfries, but merely to show that, in so far as the facts go, they do not appear to warrant the conclusions which have been so generally drawn from them; and it is both unphilosophical and unwise to jump at a conclusion, however agreeable it

may be to our preconceived notions, unless the facts on which that conclusion rests are incontrovertible, and admit of no other conclusion being arrived at.

The only other disease which it seems necessary to notice in connection with the above Scottish towns is consumption. In all those towns, excepting Edinburgh and Leith, *tabes mesenterica*, or decline, is included under the term consumption; but this will not vitiate the comparison of the proportionate mortality in those towns, as all use the same classification of disease; neither can it lead to error in a medical point of view, seeing they are both but different forms of tubercular disease.

Of all the Scottish towns, the mortality from consumption during the past year was lowest in Dundee, amounting to only 10·2 per cent. of the total deaths. Even if all the deaths classified under the term, "disease of chest," were added, the mortality from these complaints would only amount in Dundee to 13·0 per cent., a proportion for chest diseases far below that of every other Scottish town. Neither is the above proportion of deaths by consumption a casual occurrence, but Dundee maintains its pre-eminence in this respect, year after year. Thus, in 1845 the deaths from consumption in Dundee formed only 11·9 per cent. of the total deaths; in 1846 they formed 12·4 per cent., and in 1847 they amounted to 10·7 per cent. of the total deaths. Dundee, then, in so far as consumption is concerned, is a very healthy place, notwithstanding its manufactories, &c.; and the cause of its freedom from this bane of the human race, even among its manufacturing population, is well worthy of a careful investigation.

The proportion of deaths from consumption (including *tabes*) during the past year in Edinburgh was 12·0 per cent. of the total deaths; in Greenock, 14·7 per cent.; in Leith, 15·2 per cent.; in Glasgow, 16·9 per cent.; while in Paisley, not even including the deaths from consumption above 60 years of age, the proportional mortality was so high as 19·0 per cent. of the total deaths. If the deaths from consumption above 60 years of age were added, the mortality of that disease in Paisley would amount to no less than 20·7 per cent. of the total deaths. This is indeed a fearful mortality in Paisley, far exceeding that of any other disease during the past year. Neither is it a casual mortality, occurring like epidemics at long and distant intervals, but regular from year to year. Thus, notwithstanding the excessive mortality there from typhus fever, in 1847 the deaths from consumption under 60 years of age amounted to 18·6 per cent. of the total deaths; and in 1846, a year of mean mortality, they were no less than 21·7 per cent. of the total deaths. The causes of the excessive mortality of this disease in Paisley are well worthy of a careful investigation, for it cannot for a moment be doubted that much might be done to arrest its fatality. The peculiar habits of the

people, but especially the nature of the occupation of a large proportion of the inhabitants,—a manufacturing population confined to the close air of cotton mills and other manufactories, aggravated no doubt by the children being forced to work at a too early age, drugged, perhaps, with laudanum during infancy, &c., may perhaps be the chief causes of this large mortality from consumption.

The proportional mortality of diseases of the brain was lowest in Greenock and highest in Dundee. In Greenock, the deaths from brain diseases amounted to only 2·3 per cent. of the total deaths; in Paisley, to 4·2 per cent.; in Glasgow, to 4·7 per cent.; in Leith, to 6·0 per cent.; in Edinburgh, to 6·1 per cent.; while in Dundee, they amounted to no less than 7·4 per cent. of the total deaths.

The peculiarities which each of these towns presented in their mortality during the past year, may therefore be summed up in a few words. GREENOCK, with a constant small mortality from diseases of the brain, has almost wholly escaped scarlet fever, measles, and hooping-cough; while it has suffered more than any other town from typhus fever. DUNDEE, with a constant low mortality from consumption, has suffered much from typhus fever, and has been ravaged to a greater extent by scarlet fever and small-pox than any other town. The mortality from brain diseases has also been excessive. PAISLEY, with a constant and excessively high mortality from consumption, has suffered considerably from scarlet fever, typhus fever, and small-pox. ABERDEEN, from the imperfect returns of diseases I have procured, seems to have suffered greatly from scarlet fever, apparently as much as Dundee itself. GLASGOW, with its rather high mortality from consumption, has suffered considerably from typhus fever, scarlet fever, and cholera, during the past year, to which list small-pox also might be added. EDINBURGH, with its comparatively low mortality from consumption, has suffered much from typhus fever, scarlet fever, and cholera. And LEITH, also with its low mortality from consumption, though it did not suffer so heavily from typhus fever, was ravaged by cholera and scarlet fever.

As the mortality in Edinburgh seems to be peculiarly under the influence of atmospheric agencies, it was intended to have concluded with a few remarks on the influence of weather on the different classes of disease. As the attention has, however, been so frequently devoted to the subject in the quarterly reports, it would only be waste of space to repeat here what is given there in detail. It may, however, be remarked, that in order to observe the influence of atmospheric agencies on any great mass of human beings, it is absolutely necessary that they be placed in a situation where the weather will affect nearly all alike. If, therefore, we endeavour to draw any conclusions as to this influence from the varying number of deaths over a whole county or kingdom, we should probably fail in deducing any useful information; for it

might happen that weather which increased disease in one locality, would arrest it in another, in consequence of its different situation as to height, exposure, shelter, or drainage. Observations extending to a whole county or kingdom will therefore only exhibit in general the influence of season, but not that of the varying meteorological changes, which quite as much influence the mortality of diseases in each locality. Closely adjoining as are Edinburgh and Leith, even three years' observations clearly demonstrate that they are differently and often quite oppositely affected by the same atmospheric changes. To how much greater an extent, therefore, must difference in site, exposure, &c., modify the influence of weather on mortality over a whole county or kingdom. In order to observe this atmospheric influence on disease, the observations must in each case be confined to one locality, and the observer would require to be on the spot to note all the varying changes which it is necessary to notice. This has been imperfectly attempted to be done for Edinburgh for the last three years, and the Quarterly and Annual Reports on the Mortality there, are referred to for the result of these observations.

The following is the abstract of the Edinburgh and Leith Mortality Tables for 1848, classified according to ages and diseases; to which is appended a table exhibiting the monthly meteorological phenomena along side of the mortality.

Edinburgh and Leith Table of Ages for 1848.

AGES.	EDINBURGH.			LEITH.		
	Males.	Fem.	Total.	Males.	Fem.	Total.
1 year and under	408	299	707	78	70	148
1 to 2 years	185	206	391	51	56	107
2 — 5 -	289	277	566	76	70	146
5 — 10 -	185	193	378	43	47	90
10 — 15 -	64	66	130	14	13	27
15 — 20 -	122	96	218	20	18	38
20 — 30 -	318	285	603	47	43	90
30 — 40 -	305	299	604	64	73	137
40 — 50 -	283	262	545	57	66	123
50 — 60 -	230	253	483	47	52	99
60 — 70 -	160	202	362	32	52	84
70 — 80 -	118	164	282	24	47	71
80 — 90 -	41	51	92	5	18	23
90 — 100	2	11	13	0	1	1
100 and upwards	0	1	1	0	0	0
Not stated -	49	51	100	9	19	28
Total deaths,	2759	2716	5475	567	645	1212
Still-born, -	166	113	279	38	31	69
Total, -	2925	2829	5754	605,	676	1281

Edinburgh and Leith Classified Table of Diseases for 1848.

Class.	DISEASE.	EDINBURGH.			LEITH.		
		M.	F.	Tot.	M.	F.	Tot.
I.	Zymot., or epidem., endem. & contag. dis.	1284	1184	2468	251	317	568
II.	Diseases of uncertain or variable seat,	206	211	417	33	36	69
III.	Diseases of brain and nervous system,	208	174	382	41	32	73
IV.	Diseases of respiratory organs,	409	412	821	88	74	162
V.	Diseases of heart and blood-vessels,	50	35	85	9	5	14
VI.	Dis. of stomach & other organs of digest.	282	280	562	60	57	117
VII.	Diseases of kidneys and urinary organs,	11	11	22	2	1	3
VIII.	Child-birth, and diseases of uterus, &c.	...	76	76	.	14	14
IX.	Diseases of bones, joints, &c.	14	9	23	4	1	5
X.	Diseases of integumentary system,	3	1	4	1	1	2
XI.	Old Age,	137	230	367	29	71	100
XII.	Intemperance, violent deaths, & suicides,	80	41	121	28	11	39
	Causes not specified,	75	52	127	21	25	46
	Total deaths,	2759	2716	5475	567	645	1212
XIII.	Still-born,	166	113	279	38	31	69
	TOTAL,	2925	2829	5754	605	676	1281

Edinburgh and Leith Table of Diseases for 1848.

Class.	DISEASE.	EDINBURGH.			LEITH.		
		M.	F.	Tot.	M.	F.	Tot.
I.	Small-pox, -	48	48	96	4	1	5
	Measles, -	24	31	55	3	6	9
	Scarlet fever, -	270	260	530	78	81	159
	Hooping-cough, -	38	56	94	7	15	22
	Croup, -	26	25	51	8	10	18
	Thrush, -	4	...	4	...	...	...
	Diarrhœa, -	32	43	75	3	8	11
	Dysentery, -	6	10	16	3	2	5
	Cholera, -	196	282	478	75	110	185
	Influenza, -	16	27	43	...	8	8
	Ague, -	2	...	2	...	...	...
	Remittent fever, -	10	5	15	3	3	6
	Typhus fever, -	594	371	965	64	63	127
	Erysipelas, -	17	26	43	3	9	12
	Syphilis, -	1	...	1	...	1	1
II.	Inflammation, -	14	7	21	1	1	2
	Hæmorrhage, -	9	2	11	2	1	3
	Dropsy, -	55	87	142	8	6	14
	Mortification, -	8	7	15	3	...	3
	Cancer, -	1	17	18	1	8	9
	Atrophy, -	11	19	30	...	3	3
	Debility, -	91	59	150	11	12	23
	Sudden death, -	10	7	17	5	4	9
	Other diseases of uncertain seat,	7	6	13	2	1	3
III.	Cephalitis, -	15	11	26	2	1	3
	Carry forward,	1505	1406	2911	286	354	640

Class.	DISEASE.	EDINBURGH.			LEITH.		
		M.	F.	Tot.	M.	F.	Tot.
	Brought forward,	1505	1406	2911	286	354	640
	Hydrocephalus, -	59	54	113	19	12	31
	Apoplexy, -	44	18	62	2	8	10
	Paralysis, -	43	50	93	8	8	16
	Convulsions, -	14	10	24	2	1	3
	Epilepsy, -	5	8	13	...	1	1
	Insanity, -	15	12	27	4	1	5
	Other diseases of the brain,	13	11	24	4	...	4
IV.	Laryngitis, -	1	...	1	...	1	1
	Quinsey, -	11	11	22	1	...	1
	Bronchitis, -	5	11	16	5	1	6
	Pleurisy, -	5	5	10	2	2	4
	Pneumonia, -	69	57	126	13	11	24
	Hydrothorax, -	16	13	29	...	1	1
	Asthma, -	38	28	66	6	4	10
	Consumption, -	250	283	533	60	53	113
	Lung disease, -	14	4	18	1	1	2
V.	Pericarditis, -	2	...	2	...	...	...
	Aneurism, -	1	...	1	2	...	2
	Heart disease, -	47	35	82	7	5	12
VI.	Teething, -	62	50	112	8	13	21
	Enteritis, gastritis, and peritonitis,	118	128	246	33	23	56
	Tabes mesenterica, -	65	64	129	14	15	29
	Stomach disease, -	7	5	12	...	...	...
	Liver disease, -	14	15	29	...	3	3
	Other dis. of organs of digestion,	16	18	34	5	3	8
VII.	Nephritis, -	1	2	3	...	...	...
	Diabetes, -	1	1	2	...	...	...
	Stone, -	5	1	6	1	1	2
	Kidney disease, -	4	7	11	1	...	1
VIII.	Child-birth, -	...	63	63	...	10	10
	Paramenia, -	...	3	3	...	1	1
	Ovarian dropsy, -	...	2	2	...	2	2
	Disease of uterus, -	...	8	8	...	1	1
IX.	Rheumatism, -	1	4	5	1	...	1
	Spine, joint, and bone disease,	13	5	18	3	1	4
X.	Fistula, ulcer, and carbuncle,	3	1	4	1	1	2
XI.	Old Age, -	137	230	367	29	71	100
XII.	Intemperance, -	1	1	2	1	...	1
	Violent deaths and suicides,	79	40	119	27	11	38
	Causes not specified, -	75	52	127	21	25	46
	Total deaths,	2759	2716	5475	567	645	1212

EDINBURGH METEOROLOGICAL AND MORTALITY TABLE FOR 1848.

Month.	Barometer.				Thermometer.				Rain in inches.	Winds.	Mortality in Edinburgh.—1848.					
	High-est.	Low-est.	Mean.	Range.	High-est.	Low-est.	Mean.	Range.			5 years & under.	Between 15 & 60.	Above 60.	Total deaths.	Still-born.	Total.
January,	30.26	28.80	29.60	1.46	54°	5°	33.48	49°	1.26	W, E.	175	315 + 12	114	616	31	647
February,	30.10	28.10	29.06	2.00	57	15	39.60	42	5.21	W, E.	181	272 + 7	82	542	32	574
March,	29.90	28.20	29.24	1.70	61	26	41.19	35	2.80	W, E.	142	240 + 3	85	470	19	489
April,	29.88	29.04	29.45	0.84	65	26	43.31	39	1.06	E, NE, NW.	124	204	63	391	19	410
May,	30.12	28.96	29.75	1.16	78	35	54.58	43	0.60	W, E.	134	172 + 6	53	365	34	399
June,	30.00	29.00	29.46	1.00	75	37	55.13	38	6.04	E, W	137	170 + 5	39	351	19	370
July,	30.18	28.74	29.57	1.44	82	38	57.88	44	1.36	W, SW.	113	128 + 5	44	290	23	313
August,	29.93	29.06	29.50	0.87	70	36	54.37	34	2.00	W, E.	153	110 + 6	41	310	24	334
September,	30.12	29.08	29.59	1.04	76	35	53.94	41	1.45	S & SW, E.	197	108 + 2	43	350	22	372
October,	30.13	28.88	29.36	1.25	64	28	46.72	36	4.56	S, E.	283	173 + 4	56	516	9	525
November,	30.39	28.82	29.51	1.57	53	25	40.31	8	2.42	SW, S.	282	293 + 35	78	688	23	711
December,	30.08	28.27	29.66	1.81	59	21	40.24	38	1.45	S, F.	251	268 + 15	52	586	24	610
Year,	30.39	28.10	29.48	2.29	82	5	46.73	77	30.21		2172	2453 + 100	750	5475	279	5754
Mean of months.	30.09	28.74	29.48	1.34	66	27	46.73	39	2.51		181	204 + 8	62	455	23	478

Canaan Cottage, where the meteorological tables are kept by Alexander Adie, Esq., is situated about a mile to the south of Edinburgh, in latitude $55^{\circ} 57'$, and is 246 feet above the mean level of the sea.

The figures after the + mark in the second column of the mortality table show the number of persons whose ages were not ascertained.