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Publication/Creation

Edinburgh : [Printed by Stark and Company], 1848.

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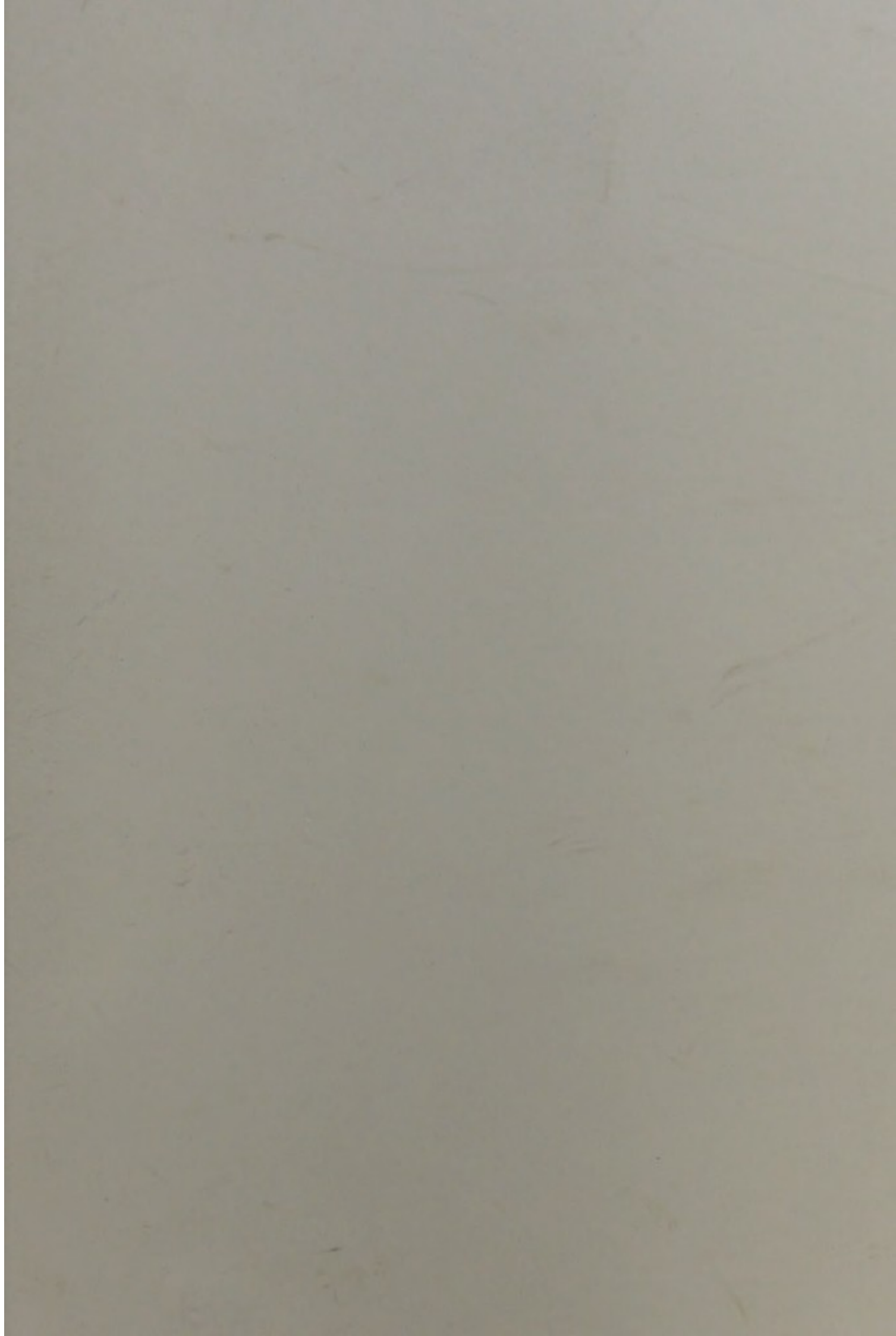
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with Dr Stark's best respects.

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REPORT
ON THE
MORTALITY
OF
EDINBURGH AND LEITH,
FOR
THE YEAR 1847.

BY

JAMES STARK, M. D.

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.

EDINBURGH:
PRINTED BY STARK AND COMPANY.

MDCCCXLVIII.

THE REPORT OF THE

REPORT

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MORTALITY

EDINBURGH AND LEITH

THE YEAR 1847

JAMES STARK, M.D.

PHYSICIAN TO THE ROYAL DISPENSARY OF EDINBURGH

EDINBURGH

PRINTED BY STARK AND COMPANY

RODGERS

R E P O R T.

THE mortality of Edinburgh for the year 1847, amounted to 7026,—3514 being males, 3192 females, and 320 still-born. The mortality for the year 1845 was 3976, that for 1846 was 4887.

The mortality of Leith for the year 1847 amounted to 1031,—483 being males, 472 females, and 76 still-born. The mortality for the year 1845 was 544, that for 1846 was 868.

The mean temperature of the year was 47.42 Fahr., being 2 degrees colder than the mean temperature of 1846, but 1 degree and 2-10ths warmer than that of 1845. The range of temperature during the year amounted to 62 degrees, 83 being the highest and 21 the lowest degrees noted in the shade during that period. The quantity of rain which fell amounted to 21.82 inches, being 8.86 inches less than the fall during 1846, and 4.83 inches less than the fall of rain during 1845. West winds blew 135½ days, east 87½ days, south-west 41 days, north-east 39 days, north-west 26 days, south-east 14½ days, and other winds for shorter periods.

As the mortality of Edinburgh and Leith has been higher during the past year than it has ever previously been, it may not be uninteresting to show, from the facts which have already been published, that the same high mortality has very generally prevailed in the larger towns of Britain. The ratio of that increase, however, has varied in the different towns according to various circumstances which it is unnecessary here to mention.

The following table, then, exhibits the mortality of certain towns of Great Britain for the years 1845, 46, and 47, and the ratio of increase in 1847 above the mortality of 1845 and 1846. As the year 1845 was one of average mortality, the towns are arranged according to the comparative ratio of increase in 1847 above the mortality of that year.

Towns.	1845.	1846.	1847.	Increase per cent. of mortality dur- ing 1847 above that of 1845.	Increase per cent. of mortality dur- ing 1847 above that of 1846.
Glasgow*.....	7,509	10,854	18,081	140	65
Liverpool.....	7,371	9,713	17,271	120	77
Kilmarnock†.....	449	510	908	102	78
Leith.....	486	801	955	96	19
Edinburgh.....	3,688	4,594	6,706	81	45
Paisley.....	1,154	1,429	2,068	79	44
Carlisle.....	752	1,098	1,331	75	21
Manchester.....	6,022	7,810	9,540	58	22
Wolverhampton.	2,091	2,391	3,205	53	34
Birmingham.....	3,604	4,686	5,406	50	15
London.....	48,935	49,763	60,442	23	21

* The number of still-born for the year 1845 was not ascertained. The average number of still-born, viz. 750, was therefore deducted from the total burials for that year to reduce the numbers to the deaths alone.

† These numbers include the still-born, whose exact numbers could not be ascertained.

The most formidable class of diseases during the past year has been the zymotic (epidemic, endemic, and contagious) diseases. In 1846 the mortality from this class amounted in Edinburgh to 24 per cent. of the total mortality, but during the past year it increased to 39 per cent., and in Leith, to 29 per cent. of the total mortality. Typhus fever was the epidemic which caused this great increase, causing 22 per cent. of the total mortality in Edinburgh, but only 11 per cent. in Leith. Till October it seemed to be chiefly propagated by contagion, having been imported into the city by the Irish immigrants; but after this period it assumed all the characteristics of a true epidemic appearing over every part of the town and among all classes without its origin or continuance then, being attributable to other than epidemic agency. In Leith it broke out as an epidemic in September, and continued as such till the close of the year. The following is the percentage of epidemic diseases to the total mortality in Edinburgh (still-births excluded) for every month during the past year, and for the first two months of the present year.

1847. January,.....	20 per cent.	1847. August,	40 per cent.
February, ...	23 ...	September,...	44 ...
March,	23 ...	October,	48 ...
April,.....	30 ...	November,...	49 ...
May,	33 ...	December, ...	51 ...
June,	46 ...	1848. January,.....	47 ...
July,	46 ...	February, ...	47 ...

The epidemic diseases are thus seen to have attained their maximum of intensity during December, when the mortality therefrom amounted to 16 per day, and exceeded the half of the total deaths.

It was formerly the belief of physicians, that when an epidemic prevailed, it swamped to a great extent all other diseases, attacking and cutting off by preference those who would have fallen victims to other diseases. The mortality of 1847 does not, however, bear out this view; but, on the other hand, shows that the deaths resulting from epidemics are superadded to the mortality from all other causes, and that the ordinary diseases continue to cut off the same proportion of cases as if no predominant epidemic prevailed. Nay more, last year's mortality even allows the inference to be drawn, that the epidemic constitution increased the fatality of the ordinary diseases, adding to them all the deaths from the prevailing epidemics. Thus, in 1846 there died from the ordinary diseases (excluding the epidemics) 3453 persons, but in 1847 the mortality from the same diseases amounted to 4027. The same fact was noticed in 1832 and 1837, when the epidemic cholera and the epidemic influenza raged here.

During the year, 1517 persons fell victims to Typhus fever in Edinburgh. Of these 76 only died during the first quarter of the year, 236 during the second quarter, 414 during the third quarter, and 791 during the last quarter. As the deaths during the first quarter did not exceed the average proportion dying per quarter in Edinburgh, it is apparent that typhus fever did not become prevalent here till after the first quarter, but, as was pointed out in the monthly reports, began to extend its ravages in April, and continued, with few exceptions, steadily increasing in severity and fatality till the close of the year. In Leith, on the other hand, typhus fever did not break out as an epidemic till the last month of the third quarter of the year. Only 17 died from it during the first quarter, 11 during the second quarter, 20 during the third quarter, while during the last quarter the deaths increased to 60. The probable causes of this peculiarity will be alluded to afterwards.

This epidemic occurred in every varying degree of mildness from the slight febricula to the worst type of spotted or petechial typhus. The mortality of the milder forms varied from one death in 20, to one death out of every 25 cases; but as the fatality of the severer forms and of the typhoid cases rose so high as one out of every 3 or 4, the general morta-

lity of the disease here up to the middle of November was ascertained to have been very nearly one out of every 8 attacked with the disease. From the middle of November, when influenza broke out, the fatality of all the fever cases increased, so that the mortality rose to a fraction more than one death out of every five cases, and continued at this high rate till the close of the year. Taking the average of one death for every 8 cases of fever, gives 12,136 as the number of fever cases in Edinburgh during the past year, or about one case of fever for every 12 inhabitants of the city, according to the census of the population for 1841. In fact, during the year there have died from fever alone 376 persons more than died during 1846 from the whole numerous class of zymotic diseases, including typhus fever, measles, small-pox, hooping-cough, scarlet fever, diarrhœa, cholera, &c.

One circumstance relative to the typhus fever of Edinburgh of the past year deserves notice, that is, the great disproportion between the sexes. Thus, of the 1517 deaths from this cause, 924 were males, but only 593 females; in other words, the males were upwards of a third more numerous than the females. As the disease first appeared among the immigrant Irish who flocked to Edinburgh to avoid the famine and pestilence in Ireland, and the greater proportion of these were males, the disproportion between the sexes may be accounted for in this way. During the latter portion of the year, again, when the mortality rose higher, and the cases were of a more severe type, the disbanding of the numerous labourers on the railways, and the flocking of these to town, once more furnished a numerical disproportion of male cases. In Leith, on the other hand, which was not subjected to the inroads of the Irish, the number of male and female deaths from fever was exactly equal.

Typhus fever has this unfortunate peculiarity, that its chief victims are those in the prime of life. Thus during the past year, of the 1517 deaths from this cause, only 240 were below 15 years of age, and 107 above 60, while 120 were between 15 and 20 years of age, 327 between 20 and 30 years, 267 between 30 and 40 years, 266 between 40 and 50 years, 163 between 50 and 60 years, and 26 adults whose exact ages could not be ascertained. The youngest child recorded as dying of typhus fever was 24 days old, the oldest person was in his 90th year.

The next most fatal zymotic disease in Edinburgh during the past year was Hooping-cough, which cut off 279 persons (amounting to 4 per cent. of the total deaths), 131 being males, and 148 females. There was thus an increase of 28 deaths on this disease during 1847 over the mortality from this cause in 1846. In Leith this disease was somewhat more prevalent than in Edinburgh, and the deaths therefrom proportionally greater by about a half per cent.

217 deaths from Measles were registered in Edinburgh during 1847, being 34 more than during the previous year; being in the proportion of 30 out of the 1000 deaths. Of these 111 were males, and 106 females. In Leith this disease was much less prevalent, the deaths being only in the proportion of 16 to the 1000 deaths.

Small-pox has been unusually prevalent, but especially in Leith, during the past year. In Edinburgh the deaths therefrom were in the portion of 24 out of the 1000 deaths, but in Leith they were in the proportion of 67 out of the 1000 deaths, or nearly three times as numerous. It is melancholy to observe that, of the 227 deaths from this disease in Edinburgh and Leith, 218 were registered as having occurred in persons not protected by vaccination. Of the other 9 cases 7 were thought to have been previously vaccinated, but nothing was known of the remaining 2 cases. On looking over the recorded deaths from small-pox in Edinburgh, from the introduction of vaccination in 1799 to the present day, it is impossible to fail remarking that the number annually dying from small-pox is on the increase. During the first decade of the present century (1800 to 1809), the deaths from small-pox averaged 45 annually. During the second de-

cade they numbered 27 annually. During the third decade, 42 annually. During the fourth decade, 83 annually. While, during the present decade, the deaths have averaged no less than 110 annually. In my "Inquiry into the probable cause of the continued prevalence and fatality of Small-pox," published in 1845, it was shown that this was owing to the neglect of vaccination, and every succeeding year furnishes additional proofs of the same fact. In England, with all the assistance which is afforded by the Vaccination Act, we learn from the Twelfth Annual Report of the Poor Law Commissioners, that "the number of children vaccinated under one year of age is only 32 per cent. upon the number of births;" and if to this number we add 20 per cent. for the children of the upper classes vaccinated by private practitioners, which is a very large proportion, there is still left nearly a half of all who are born unprotected in England by vaccination. Since vaccination has begun to be so much neglected we have had small-pox as an epidemic among us every second or third year, as for instance in 1837, 1840, 1842, 1845, and 1847;—and unless some active means are taken to enforce vaccination on every child shortly after birth, we may soon see this most loathsome disease as prevalent and fatal among the lower classes as it was before the introduction of vaccination.

Scarlet fever towards the end of the year began to increase, but only 23 deaths from that cause were registered in Edinburgh and Leith during the year.

Croup was both prevalent and fatal during the last quarter of the year, more especially after the outbreak of influenza; for while 12 only died from this cause in Edinburgh during the third quarter, the mortality of croup rose to 35 during the last quarter.

The mortality of Influenza was almost entirely limited to the month of December. Leith suffered less severely than Edinburgh; the deaths there being in the small proportion of 15 per 1000 of the total deaths, or 5.4 out of every 10,000 of the population, while the deaths in Edinburgh were in the proportion of 18 per 1000 of the total deaths, or 8.9 out of every 10,000 of the population. This fact, therefore, shows the influence of exposed site on the prevalence and fatality of the disease, the low-lying comparatively sheltered situation of Leith rendering the influenza milder and less prevalent than in high-lying exposed Edinburgh.

As much unnecessary alarm is created every succeeding year by the report that epidemic or Asiatic Cholera has appeared among us, a few remarks on this disease may properly be added. Ever since the epidemic cholera was here in 1832, a few cases have annually occurred, which, in so far as mere symptoms were concerned, could not be distinguished from that disease. Three or four deaths from such suspicious cases occurred in Edinburgh and Leith* both during last and the previous year; but there was nothing to warrant the conclusion that such cases were epidemic cholera, seeing that, *unless the disease assumes the form of an epidemic*, it is quite impossible, from the mere symptoms, to assert that the cases are other than severe ones of British cholera. There is no one symptom or series of symptoms diagnostic of the epidemic cholera, but the circumstance of its assuming the epidemic type; and so long as the suspicious cases which occur do not assume this type, we can never venture to assert that that formidable epidemic is here. Some writers have ventured to assert that certain symptoms are diagnostic of the epidemic cholera; but those who really paid any attention to the varying symptoms of the epidemic of 1832 will be found to acknowledge that during that year, death itself ensued in several cases in which not one of the so-called diagnostic symptoms were remarked. This fact I myself witnessed. Unless the cholera, therefore, appears as an epidemic, we have nothing to fear from the

* Three deaths from cholera occurred in Leith during 1847; but as the particulars of the cases were not procured till after the tables were made up, they were registered under the head of causes of death not specified.

occurrence of a few suspicious cases, even though we go the length of admitting them to be sporadic cases of the Asiatic disease.

Of the other diseases, the mortality during 1847 was, with a few exceptions, almost the same as during the previous year;—the rise being almost entirely confined to diseases of the respiratory and digestive organs, to childbirth, and to old age.

Diseases of the Brain and nervous system were at their minimum during the first quarter of the year, only 117 deaths occurring during that period. During the last quarter, the deaths from this cause rose to 149. The chief rise on this class of diseases during the last quarter was on hydrocephalus (water in the brain), when 53 died from that disease, only 32 having died from that cause during the first quarter. Apoplexy and paralysis were least fatal during the third quarter of the year—the deaths respectively amounting to 19 and 18. During the last quarter, apoplexy cut off 27 and paralysis 29 persons.

Diseases of the Respiratory organs (not including influenza, whooping-cough, or croup, which are zymotic diseases) were most fatal during the first quarter of the year, and least fatal during the third quarter. Thus, during the first quarter, the deaths from this cause amounted to 415; during the second quarter to 313; during the third quarter to 267; and during the fourth quarter to 390,—thus very distinctly showing the influence of temperature on the fatality of this class of diseases. Pneumonia was unusually prevalent during the first quarter of the year—90 deaths being registered during that period. This disease declined in frequency till the end of the third quarter, at which period only 34 deaths were registered. The severe weather, however, during November and December, again raised the mortality of pneumonia to 74 for the last quarter. Consumption was most fatal during the second quarter of the year,—indeed, it has long been noticed that the spring months are most fatal to those labouring under that disease. Bronchitis in its fatality showed its close dependence on temperature. Thus, during the first quarter, it caused 53 deaths; during the second quarter 12 deaths; during the third quarter only 7 deaths; but during the fourth quarter 41 deaths. If to this last number the deaths from the epidemic bronchitis (influenza) be added, the total deaths from bronchitis during the last quarter would amount to 161.

Notwithstanding the greater prevalence of bowel complaints in 1846, the mortality from inflammatory affections of the organs of digestion during 1847 greatly exceeded that of 1846. Thus, in Edinburgh, the deaths from diseases of the digestive organs amounted to 493 in 1846, but increased to 598 during 1847. The whole increase was limited to one class of cases, viz., inflammation of the bowels, the deaths from which in 1846 amounted to 95 only, but in 1847 had increased to 193. The mortality from this cause was greatest during the last quarter, when the alternations of temperature and the epidemic constitution of the air were greatest. The same fact was observed at Leith. During 1846, the deaths from inflammation of the bowels amounted to 10 only, but during 1847 they increased to 35.

The deaths from child-birth during 1846 amounted in Edinburgh to 43 only, but during the past year they increased to 74. This increase occurred chiefly during the last quarter of the year when many cases of puerperal fever occurred. In Leith, the increase was much less considerable, but the proportion of deaths from childbirth to the total mortality was greater than in Edinburgh.

As the mortality during the past year has been unexampled within any period of which distinct records are preserved, it may not be uninteresting to notice the various fluctuations it has undergone during the several quarters of 1847, in order that the knowledge of this may enable us to arrive at some more determinate conclusions as to its causes.

During the first quarter of 1847, the mortality in Edinburgh, excluding

the still-born, amounted to 1403, being an average of 467 monthly, or a fraction more than 15 deaths daily. During the second quarter of the year, the deaths amounted to 1526, and during the third quarter to 1527, —giving an average of 509 deaths per month, or nearly 17 per day. During the fourth quarter, the deaths amounted to 2251, yielding an average of 750 per month, or 25 per day. With reference, however, to the last quarter, it is necessary to notice that the mortality of October was the same as that of the six previous months, viz. 17 deaths daily; that of November increased to 728, or averaged 24 deaths daily; while the mortality of December, amounting to 1001, averaged no less than 32 deaths daily.

As a means of comparison with the above, it may be stated that the average mortality for the seven previous years, viz. from the commencement of 1840, has been 331 deaths per month, or 11 deaths daily. But as the first and fourth quarters usually exhibit an increased number of deaths, the average gives 10 deaths daily for the second and third quarters, and 12 deaths daily for the first and fourth quarters of the year.

From the above statement three conclusions may be drawn. *First*, That some cause must have produced the increased mortality during the first quarter, which was not in operation during the previous year. *Secondly*, That in the beginning of the second quarter, some additional source of sickness and mortality must have come into operation, which, instead of allowing the mortality to fall below that of the first quarter, increased the deaths by two daily, and continued uninterruptedly and steadily producing the same effect till November. *Thirdly*, That during November and December, some other and more powerful cause of sickness and death must have come into operation, which raised the deaths from 17 to 32 per day. The probable causes of these variations in the mortality will now be endeavoured to be pointed out.

The failure of the potato crop in the autumn of 1846, the deficiency of the corn crop, and the prevalence of the epizootic disease among cattle, raised the price of all kinds of provisions to a most exorbitant height. The consequence was, that most of the poorer classes who in ordinary years subsist chiefly on oatmeal porridge, potatoes, and milk, were obliged to substitute unazotized substances, such as treacle or beer, for the highly azotized principle milk, and use other substitutes for the potatoes. As oatmeal, however, in proportion to its real value, rose much higher in price than wheaten flour, porridge also was in many cases given up, and bread, with tea or coffee, substituted. Very little animal food was used by the lower classes, and milk was too scarce to be obtained by them. The consequence was, that scurvy in all its varied forms made its appearance, and appeared to render all more liable to be affected by the atmospheric vicissitudes and external agencies than if they had remained in vigorous health. This scorbutic tendency was not confined to the poor alone—though it was only among them that the severer forms of scurvy were remarked—but was observable to a small extent in all classes, among many of whom it could not be traced to any deficiency of proper nutritious food, unless it arose from the simple want of the potato, but appeared alone attributable to epidemic influence. Hence it happened that during the first quarter of the year, the increase in the number of deaths above the average mortality in Edinburgh was almost solely confined to persons labouring under diseases of the respiratory organs, and to those registered under the head of old age,—two classes much influenced by atmospheric agencies. During this quarter, no epidemic disease existed which could account for the unusual mortality, for scurvy, though very general, caused very few deaths; and even typhus fever itself was in Edinburgh rather below than above the average.

During the first month of the second quarter (April), typhus fever broke out and rapidly extended its ravages, not so much, however, among the resident population, as among the immigrant Irish, who flocked to this

city in immense numbers to avoid the pestilence and famine in Ireland, and the typhus fever, which they had been the chief agents in importing into Glasgow. Many of these arrived labouring under the disease, others brought the seeds of the disease with them, and were seized therewith very shortly after their arrival; and so infectious was it, that wherever they lodged they communicated the disease to almost all coming in contact with them. From the period of these arrivals, and the consequent prevalence of fever, the general mortality rose from 15 to 17 deaths daily, and so long as these causes were kept up, continued at the same unvarying height till the middle of November, when another cause came into operation. Now it is not a little remarkable that if the deaths from typhus fever during the above period (*viz.* from April to October included) were subtracted from the general mortality, the average number of deaths per day would be only one daily above the daily average of the past seven years, *viz.* only 12 daily,—thus showing that nearly the whole increase in the number of deaths during the above seven months was attributable to the prevalence of the typhus fever which had been imported into the city.

The word imported has been designedly used to express the leading characteristic of the typhus fever which has been raging here for so many months. Unless a disease assumes the form of an epidemic, that is, breaks out about the same time among various classes of the population, and in different localities, without its rise being attributable to imported contagion, it does not seem reasonable to term that disease an epidemic. Now, the typhus fever in Edinburgh, from its first appearance in the beginning of April, till October, except in a few isolated cases, owed its origin and propagation almost entirely to imported contagion. After this it assumed the true epidemic type. It hung about, indeed, was for a long period almost wholly confined to the lodgings and low hovels frequented by the immigrant Irish, and seized all coming in contact with them; whereas many closes and places where in epidemic years typhus fever rages, wholly escaped during the above period, apparently because they were not frequented by the Irish. Indeed, so contagious was the fever which these immigrants carried with them, that numerous instances occurred in which it was ascertained that the same family communicated the disease to every lodging-house they entered, though at the moment none of the family were labouring under the disease. Even cleansings, fumigations, and white-washings, which invariably alleviate or check typhus fever when epidemic, and aggravated by local causes, appeared to have little or no effect in checking the disease or moderating its virulence; even within a few days after these poor people were allowed to return to their cleansed dwellings, fever among them was as bad as before, seeing they brought the infection along with them.

In proof of this view may be instanced the fact, that so late as June, when all the wards of the Royal Infirmary and several temporary hospitals were filled with fever patients, and the fever had been raging for nearly three months, it was ascertained that by far the greater proportion of fever patients were Irish. Thus, of 473 fever patients in that institution on the 10th of June, 379 were natives of Ireland, only 87 of Scotland, and 7 of England. Again, the whole excess of mortality in Edinburgh during the greater portion of the second and third quarters was confined to the very lowest classes of the resident, and to the immigrant population, and in particular to that portion which is interred at the public expense. Hence, the city burying-ground, which alone received the bodies of paupers for burial, was almost the only one which exhibited an increase in the number of its burials during that period. Instead of interring from 85 to 90 bodies per month, the number increased to upwards of 200. The same fact was evidenced from what occurred at Leith—a town in the immediate vicinity of Edinburgh, but not subject to the inroads of the Irish who flooded Edinburgh. When typhus fever occurs as an epidemic, Leith,

in proportion to its population suffers somewhat more severely than Edinburgh; but even in the month of August not one death from typhus fever was registered as occurring in Leith, while the mortality from fever in Edinburgh during that month amounted to 131.

Another argument in favour of the view that typhus fever in Edinburgh was chiefly an imported disease was the fact, that the great majority of cases and of deaths were of the male sex. Thus, of 1517 deaths from fever, 924 were males and 593 females. Had the fever, however, depended principally either on epidemic, that is, atmospheric, or on endemic, that is, local causes, a much larger number of females would have fallen victims to it, at least they would have equalled the males in number. This is evident from the circumstance that females are more numerous in our population than males; so that, if the fever originated in epidemic causes, the females, from being more exposed to the aggravating local causes, would at least have been affected in equal numbers with the males. Many facts might be adduced to prove this point. In Leith, where the disease was clearly epidemic, the deaths among the males and females during the past year were exactly equal in number. In Glasgow during the year 1843, when typhus fever prevailed in a truly epidemic form, 671 males died, but no less than 726 females. In Dundee during the years 1839, 40, and 41, there died of fever 178 males and 186 females. And lastly, if we take all England, we shall find from the Registrar-General's Reports, that the very same position is proved, viz. that during epidemics of fever, the deaths among the females from that cause somewhat exceed the males in number. Thus in 1838, over all England, there died from fever 7643 males, but 8023 females. In 1839, the deaths from fever were 9282 males, but 9493 females; in 1842 the male deaths numbered 7056, the female deaths 7971, &c.

These two causes, then—the Scurvy during the first quarter, and the Typhus fever during the second and third quarters—contributed to keep up the mortality till the middle of November, when a new cause came into operation, viz. the Epidemic Bronchitis or Influenza. This disease, unlike the typhus fever, was clearly dependent on, and was traceable to, atmospheric agencies. During the last quarter, it twice suddenly attacked great masses of the population, *first*, on the 18th of November, and *again* on the 28th of the same month. In both cases the attacks were made during the same kind of weather, viz. sudden intense frost, attended with a thick, damp, wetting fog, immediately following very mild soft weather; and the number of persons laid up on each of these days was so great, and the attacks so general, that it was quite impossible to avoid noticing the coincidence. It is not meant to be stated that these meteorological phenomena were the sole causes of the influenza, though it is possible they might be, but they were the only apparent and tangible ones; there was probably also connected with these some unknown influence which caused these damp fogs and sudden depression of temperature to produce the epidemic catarrh. It is instructive to note, that from the 18th of November, the day when influenza first broke out, the mortality rose till it attained its maximum on the 30th of that month, two days after its second general attack, during which day no fewer than 61 deaths were registered, the usual winter average being only 12 deaths daily. Up to this period, only 15 deaths were ascribed to influenza, so that this great increase of mortality was not caused by that disease, but by the atmospheric agencies acting prejudicially on all other diseases, aggravating their symptoms, and rendering them more than usually fatal. From the 30th of November, the general mortality began slowly but steadily to decline. For the first four days of December, the deaths averaged 48 daily; during the next seven days the average was $37\frac{1}{2}$ deaths daily; during the second seven days the average was 35 deaths daily; while, for the last two weeks of the month, the average fell to 21 deaths daily. These facts, then, clearly show that it was one general cause which gave rise to the outbreak of influenza, and to the great increase in

the general mortality ; and though we may be unable to point out the unknown causes of these, it is not a little satisfactory to be able to trace both to such apparent and intelligible atmospheric changes as those which attended the outbreaks of the epidemic catarrh.

During the continuance of the influenza, much trouble was taken to ascertain whether a high and exposed situation, or a low sanitary condition of a district rendered those inhabiting such localities more liable to the disease. *First*, It was distinctly ascertained that the inhabitants of exposed situations were much more severely and more generally affected than those living in low sheltered sites. Thus the inmates of George Heriot's Hospital, on a high exposed site, suffered severely, a full half being in bed on the 29th November ; while in George Watson's Hospital, immediately adjoining, but on a low sheltered site, very few indeed were affected, and none severely. In the Merchant Maiden Hospital, on a low lying but exposed site, of 86 girls 50 were confined to bed with influenza on the 29th November ; whereas, in the Trades' Maiden Hospital, also on a low but very sheltered site, not an inmate was affected by the disease. *Secondly*, The low sanitary condition of a district was not found to render those inhabiting it more liable to be affected with the disease. Of children living in the Cowgate, Grassmarket, and other low-lying close and dirty situations, and attending school, only 35 per cent. were absent from school from influenza on the 29th November, and those attending school appeared quite healthy. Of the children of the upper classes, in the exposed New Town, living in well-aired cleanly houses, and attending school, 62 per cent. were confined with influenza, and many attending were so ill they ought to have been kept at home. Many similar facts might be adduced, proving the same point—viz. that the severity of the attacks of influenza was regulated by the exposure of the situation, and not by the sanitary condition of the district.

These three great causes, then, 1st, the scorbutic tendency ; 2d, the typhus fever ; and, 3d, the influenza and its atmospheric causes, appear to have been the chief agents in increasing the mortality of the past year.

Having thus noticed the three special causes of the high mortality of the past year, some allusion may be made to those general causes which have a marked influence on all of them. That the weather has a marked influence on the mortality there can be no doubt ; but as this influence has been so frequently pointed out in the monthly reports, it need not be enlarged on here. But there is another cause which experience and observation has also shown to have a marked effect on the general mortality, viz. the failure of the crops and the consequent high price of provisions. M. Messance, in his interesting work entitled "*Recherches sur la Population*," &c., published in 1764, shewed the close connection between the number of deaths in most of the towns and provinces of France, and the price of grain. His work gives the statistics of mortality and the prices of grain from 1674 to 1764, a period of ninety years. M. Melier took up the same subject in 1843, and traced the connection of the same phenomena from 1764 up to that date. These two valuable works thus form a body of evidence of the most conclusive kind as to the close connection of high mortality with scarcity and high price of provisions. One example of this influence may be quoted from these works. The four most unhealthy years which occurred between 1744 and 1763 were selected and compared with the four most healthy years within the same period, when it was found that in Paris the average annual mortality amounted to 20,895 during the unhealthy years, but only to 16,859 during the healthy years, or 4036 fewer deaths during each healthy year. The average price of wheat during the four unhealthy years was 19 livres 1 sous (about 15s. 10½d.) the setier (a little more than 4 bushels) ; but only 14 livres 8 sous (about 12s. 5d.) the setier, during the four healthy years. During the present century, however, it is shown that the influence of years of scarcity on the general mortality has greatly diminished ; and M. Melier accounts very rationally

for this fact. During the last century agriculture was comparatively in its infancy, and a failure of the crops deprived thousands of the means of living. Of late years, however, not only was a much larger proportion of grain raised as compared with the number of the population, but the introduction of the potato, he thinks, has been the principal means of saving the people from the effects of years of scarcity, seeing that that root was every year more largely cultivated, and often succeeded best in France in years when the corn crops failed. The failure of the potato crop, however, during the autumn of 1846, seeing that it constituted such a large proportion of the food of all, but especially of the lower classes, proved a very serious matter. This failure of the potato crop, the scantiness of the grain crops, and the consequent high price of all kinds of provisions, have, during the past year, had precisely the same effect in increasing the general mortality as the same causes have been observed to have had in all former periods of history, but especially before the introduction of the potato. It is not necessary, however, to consider the increased mortality to depend on deficient quantity or unwholesome quality of the food: it is much more philosophical and consonant with observations to believe that the failure of the crops and the increased mortality are the offspring of a common cause. Noah Webster in his interesting "History of Epidemic and Pestilential Diseases," has collected many striking proofs of the connection of increased mortality (pestilential periods) with many phenomena of the natural world, such as bad seasons, failure of the crops, disease among cattle, earthquakes, &c.; and those who wish to study the matter more deeply, will find much food for serious thought in the facts which he has collected, and the conclusions he has drawn from them.

The following Tables exhibit abstracts of the Mortality Tables of Edinburgh and Leith for the year 1847, classified according to Ages and Diseases. Appended to these is a Table giving a summary of the meteorology alongside of the mortality for the year.

I.—EDINBURGH AND LEITH TABLE OF AGES FOR 1847.

AGE.	EDINBURGH.			LEITH.		
	Males.	Female	Total.	Males.	Female	Total.
1 year and under,	545	449	994	96	82	178
2 .	313	295	608	58	53	111
5 .	261	233	494	36	43	79
10 .	126	111	237	14	15	29
15 .	58	48	106	5	7	12
20 .	155	110	265	21	14	35
30 .	420	311	731	32	33	65
40 .	358	298	656	48	38	86
50 .	395	316	711	34	37	71
60 .	296	298	594	46	35	81
70 .	284	332	616	46	51	97
80 .	198	258	456	33	43	76
90 .	68	99	167	10	15	25
100 .	7	12	19	0	0	0
111 .	0	1	1	0	0	0
Not stated, .	30	21	51	4	6	10
Total deaths,	3514	3192	6706	483	472	955
Still-born, .	192	128	320	46	30	76
Total, .	3706	3320	7026	529	502	1031

II.—EDINBURGH AND LEITH CLASSIFIED TABLE OF DISEASES FOR 1847.

Class.	DISEASES.	EDIN.	LEITH
I.	Zymotic dis. (epidemic, endemic, and contagious)	2679	285
II.	Diseases of uncertain or variable seat,	428	64
III.	Diseases of brain and nervous system,	516	84
IV.	Diseases of respiratory organs,	1385	212
V.	Diseases of heart and blood-vessels,	114	14
VI.	Dis. of stomach, liver, and other organs of digest.	598	106
VII.	Diseases of kidneys and urinary organs,	39	2
VIII.	Child-birth, and diseases of organs of generation,	87	16
IX.	Rheumatism, diseases of bones, joints, &c.	27	7
X.	Diseases of the integumentary system,	8	2
XI.	Old age,	617	115
XII.	Intemperance, violent deaths, privation, suicides,	141	34
	Disease not specified,	67	14
	Total deaths,	6706	955
XIII.	Still-born,	320	76
	Total,	7026	1031

CLASSIFIED TABLE OF DISEASES FOR 1847.

Class.	DISEASE.	EDINBURGH.	LEITH.
I.	Small-pox, (vaccinated)	6	3
	Do. (not vaccinated)	157	61
	Measles,	217	16
	Scarlet fever,	20	3
	Hooping-cough,	279	42
	Croup,	89	13
	Thrush,	20	...
	Diarrhœa,	118	9
	Dysentery,	32	1
	Cholera,	11	...
	Influenza,	125	15
	Remittent fever,	22	3
	Typhus fever,	1517	108
	Erysipelas,	59	11
	Syphilis,	7	...
II.	Hæmorrhage,	19	1
	Anæmia,	3	2
	Dropsy,	154	26
	Abscess,	6	.
	Mortification,	8	1
	Purpura and scurvy,	7	...
	Scrofula,	4	1
	Cancer,	26	7
	Tumour,	4	...
	Atrophy,	3	1
	Debility,	178	13
	Malformation	1	1
	Sudden death,	15	11
III.	Cephalitis,	29	7
	Hydrocephalus,	165	29
	Apoplexy,	84	13
	Paralysis,	101	11
	Convulsions,	39	8

Class.	DISEASE.	EDINBURGH.	LEITH.
	Tetanus,	6	...
	Chorea,	2	...
	Epilepsy	12	1
	Insanity,	36	11
	Delirium tremens,	24	2
	Disease of brain,	17	2
	Tic douleureux,	1	..
IV.	Laryngitis,	12	.
	Quinsey,	15	2
	Bronchitis,	113	27
	Pleurisy,	21	1
	Pneumonia,	246	71
	Hydrothorax,	34	3
	Asthma,	118	14
	Consumption,	799	93
	Lung disease,	27	...
V.	Pericarditis,	4	...
	Aneurism,	3	...
	Heart disease,	107	14
VI.	Teething,	118	18
	Gastritis,	3	1
	Enteritis,	190	34
	Peritonitis,	13	3
	Tabes mesenterica,	161	34
	Worms,	1	...
	Ascites,	1	1
	Ulceration of intestines,	17	2
	Hernia,	11	1
	Colic or ileus,	4	...
	Intussusception,	4	...
	Stricture of intestines,	3	...
	Stomach disease,	15	5
	Hepatitis,	2	...
	Jaundice	11	1
	Liver disease,	43	6
	Spleen disease,	1	...
VII.	Nephritis,	3	...
	Ischuria,	1	...
	Diabetes,	9	...
	Stone,	4	..
	Stricture of urethra,	5	...
	Kidney disease,	17	2
VIII.	Child-birth,	74	13
	Paramenia,	5	1
	Ovarian dropsy,	4	...
	Disease of uterus	4	2
IX.	Rheumatism,	11	5
	Spine, joint, and bone disease,	16	2
X.	Ulcer,	5	2
	Fistula,	2	...
	Skin disease,	1	...
XI.	Old age,	617	115
XII.	Intemperance,	9	...
	Privation,	3	...
	Violent deaths and suicides,	129	34
	Causes not specified,	67	14
	Total deaths,	6706	955

III.—EDINBURGH METEOROLOGICAL AND MORTALITY TABLE FOR 1847.

Month.	Barometer.				Thermometer.			Rain in inches.	Winds general direction.	Mortality of Edinburgh.					
	Max.	Min.	Mean.	Range.	Max.	Min.	Mean.			Range.	15 years & under.	Between 15 & 60.	Above 60.	Total deaths.	Still-born.
January,	30.26	28.42	29.85	1.84	53°	21°	35.56	32°	E.	188	188	130	506	31	537
February,	30.14	28.84	29.56	1.30	51	17	36.17	34	W, NE	143	163	120	426	38	464
March,	30.34	29.00	29.68	1.34	66	21	41.32	45	E, NE	193	169 + 1	108	471	30	501
April,	29.90	28.76	29.45	1.14	61	22	43.35	39	W, NE	192	199 + 1	103	495	24	519
May,	30.28	29.12	29.70	1.16	77	32	50.88	45	W, E	196	205 + 2	111	514	25	539
June,	30.33	29.10	29.64	1.23	76	38	57.83	38	W	207	236 + 3	74	520	21	541
July,	30.14	29.48	29.78	0.66	83	42	61.22	41	W, E	221	229 + 5	88	543	22	565
August,	30.18	28.99	29.68	1.19	77	37	58.22	40	SW, W	200	212 + 12	80	504	24	528
September,	30.19	28.46	29.53	1.73	66	31	50.98	35	W	173	223 + 5	79	480	27	507
October,	30.11	28.90	29.58	1.21	68	34	48.61	34	E, NE, W	172	207 + 7	75	521	22	543
November,	30.20	28.60	29.49	1.60	60	25	45.84	35	W, SW	247	359 + 10	112	728	27	755
December,	30.05	28.14	29.38	1.91	57	21	39.06	36	E, W	307	507 + 7	180	1001	29	1030
Year.	30.34	28.14	29.62	2.20	83	17	47.42	66		2439	2957 + 51	1259	6706	320	7026
Mean of months.	30.17	28.81	29.62	1.36	66	28	47.42	38		203	246 + 4	105	558	27	585

Canaan Cottage, where the meteorological tables are kept by Mr Adie, Optician, is situated about a mile to the south of Edinburgh, in latitude 55° 57', and is 246 feet above the mean level of the sea.

Среднее количество воды, потребляемой на единицу продукции, в зависимости от количества сырья и топлива, затраченного на ее производство.

Вид продукции	Вид сырья	Вид топлива	Вид энергии	Вид воды	Вид газа	Вид пара	Вид электричества	Вид других ресурсов	Вид отходов	Вид выбросов	Вид потерь	Вид неэффективности	Вид экологических последствий	Вид экологических последствий	
														Вид выбросов	Вид потерь
1. Сырье	2. Топливо	3. Энергия	4. Вода	5. Газ	6. Пар	7. Электричество	8. Другие ресурсы	9. Отходы	10. Выбросы	11. Потери	12. Неэффективность	13. Экологические последствия	14. Экологические последствия	15. Экологические последствия	16. Экологические последствия
17. Сырье	18. Топливо	19. Энергия	20. Вода	21. Газ	22. Пар	23. Электричество	24. Другие ресурсы	25. Отходы	26. Выбросы	27. Потери	28. Неэффективность	29. Экологические последствия	30. Экологические последствия	31. Экологические последствия	32. Экологические последствия
33. Сырье	34. Топливо	35. Энергия	36. Вода	37. Газ	38. Пар	39. Электричество	40. Другие ресурсы	41. Отходы	42. Выбросы	43. Потери	44. Неэффективность	45. Экологические последствия	46. Экологические последствия	47. Экологические последствия	48. Экологические последствия
49. Сырье	50. Топливо	51. Энергия	52. Вода	53. Газ	54. Пар	55. Электричество	56. Другие ресурсы	57. Отходы	58. Выбросы	59. Потери	60. Неэффективность	61. Экологические последствия	62. Экологические последствия	63. Экологические последствия	64. Экологические последствия
65. Сырье	66. Топливо	67. Энергия	68. Вода	69. Газ	70. Пар	71. Электричество	72. Другие ресурсы	73. Отходы	74. Выбросы	75. Потери	76. Неэффективность	77. Экологические последствия	78. Экологические последствия	79. Экологические последствия	80. Экологические последствия
81. Сырье	82. Топливо	83. Энергия	84. Вода	85. Газ	86. Пар	87. Электричество	88. Другие ресурсы	89. Отходы	90. Выбросы	91. Потери	92. Неэффективность	93. Экологические последствия	94. Экологические последствия	95. Экологические последствия	96. Экологические последствия
97. Сырье	98. Топливо	99. Энергия	100. Вода	101. Газ	102. Пар	103. Электричество	104. Другие ресурсы	105. Отходы	106. Выбросы	107. Потери	108. Неэффективность	109. Экологические последствия	110. Экологические последствия	111. Экологические последствия	112. Экологические последствия

III - ЭКОЛОГИЧЕСКИЕ ПОСЛЕДСТВИЯ ИХИЗМЕНЕНИЙ ВЪЗДУШНОГО ВОЗДУХА В 1982



