ART. VI.—ON THE MEDICAL STATISTICS OF LOWER CANADA. BY WILLIAM KELLY, M. D. SURGEON, R. N.

READ 19TH APRIL, 1834.

THE Parochial Registers of Lower Canada are said to extend back to the first settlement of many parts of the Province. They have been always carefully attended to, and possess a degree of accuracy that would be difficult of attainment during the early stages of settlements in the adjoining states; but was rendered easy here by the social disposition of the people, which prevented them from settling in remote or isolated places; and their religion, which so strongly inculcates the necessity of having recourse to the Clergy, both on occasion of births and deaths. These registers therefore combine a degree of accuracy and duration, which is probably unequalled in any part of North America. They have not as far as I can learn, been hitherto investigated with any reference to the Medical Statistics of the Province, although affording the best and surest information on the subject. In the present paper I have only endeavoured to draw such inferences as may be obtained from the returns already printed; leaving to others the more arduous task of examining the manuscript

registers, connecting them with the printed ones, and extracting from both, all the various results which they are capable of affording.

The information which I have endeavoured to digest, has been derived chiefly from the Journals of the House of Assembly. The first returns appear in the Reports of the Committee on Crown Lands in 1824. It comprises the baptisms, marriages and burials in the District of Three Rivers, from 1791 to 1822; in the District of Quebec, from 1794 to 1821; and in the District of Montreal, from 1810 to 1822. There is an omission then in the Journals of the returns for three years, but since 1825 they have been regularly inserted.

In consequence of the comparatively short time for which the returns are made from the District of Montreal, and the occurrence of another gap of three years between 1817 and 1819, I have altogether omitted the consideration of that District prior to 1826.

It is to be regretted that no regular census has been taken in Lower Canada between 1784 and 1825, and that the published returns of the latter, and of the recent one in 1831, afford little that can be relied on, (as far as the objects of this paper are concerned) beyond the actual numbers of inhabitants. Even so simple a matter, as the total number of males and females separately, cannot be obtained from either, nor their relative numbers at any particular period of life. In the last census persons of both sexes under 14 years of age are given in the same column; and the ages at and under which the males are classed, beyond that period of life, are quite different from those used in the classification of the females. When the numbers of persons of different ages are summed up, they are found to exceed consid-

erably the total number.* The discrepancy seems partly owing to the number of females under 14 being sometimes placed under two heads; but in many instances neither a correction for this, or any other apparent source of error, could make the total, and details correspond. The census of 1825 is, in these respects, equally unsatisfactory. They also differ much from one another. In the census of 1825 the males above 60, are stated as 11,437; the females above 45, as 8,542; in the census of 1831, the males above 60 amounted to 13,243; the females above 45 to 27,613.†

Besides the regular census, however, returns of the amount of the population have occasionally been obtained from the Curés. Of these, within the period alluded to above, there was one in 1790, giving the number of persons in the different parishes up to the close of that year. It has not, I believe, been published, but the original papers are in the Civil Secretary's Office. Another, made in 1822, was published in the Report of the Committee on Crown Lands. The remarks accompanying the latter, contain much interesting information; but the omission of the returns for some Parishes, and of the protestants, detracts much for its value.

A comparison of the population of the Districts of Quebec and Three Rivers by the census of 1784, with the Curés'

* On correcting the return for Rimouski, which was estimated too high, and a mistake in the summing up of the total number in Bonaventure, I found the total number of persons in the Province, by the census of 1831, was 508,917. But adding together the numbers at each period of life, (those of Rimouski included,) and correcting an error of the press in the column of unmarried women, the whole amounted to 554,321.

† By the census of 1831 the proportion of insane was one in 549; of deaf and dumb, one in 1244.

returns of 1790, shews a rate of increase during the intervening period, much greater than in the subsequent one to 1825. Six years and a half, may seem perhaps too short a period to draw any conclusion from;* but the opinion, that the increase then was unusually rapid, is considerably strengthened by finding that the amount of the population, obtained by adding the excess of births over deaths to the calculated number for 1794, continues much above the increase, calculated from the census, until 1810; after which it falls below it.

The lower rate of increase in the latter period may be partly accounted for by an Emigration from the southern parts of the district of Quebec, mentioned in the letters of the Curés in 1822†. Contrary to what occurs in every other part of the Province, the surplus of births over deaths in this portion of the district of Quebec, is greater than the actual increase of the population shewn by the census. This latter circumstance, however, must be owing in some degree to the natural efflux from the country to the town, which stands on the opposite shore.

As there was, howver, a considerable immigration into the district of Three Rivers during the time, and as the rate of increase in both districts conjointly, for the whole period, was such as to double the population in $25\frac{2}{5}$ years; it is probable that what was lost by one was nearly gained by the other, since the best information as yet

* The Curés returns were made at the close of 1790, and some of them in Jan. 1791. The census of 1784 has, I believe, been taken, as usual, in Summer.

† They state that many young persons finding it difficult to procure fresh lands in their own seigniories, went to settle in the seigniories of the district of Montreal, rather than remove to the adjoining townships. There has been also an emigration of voyageurs to the north-west, but they were chiefly from the district of Montreal.

obtained, leads to conclude that about twenty-five years are necessary for the doubling of a population by the natural increase under equally favorable circumstances.

The population of the districts of Quebec and Three Rivers in 1784, was 57,285. By the Curés' returns we find that it had increased to 70,909, at the close of 1790. At this rate it would have doubled in twenty-one years.

The baptisms recorded in the districts of Three Rivers, from 1791, and of Quebec, from 1794, to 1800 inclusive, were 31,493. The burials 14,330. The surplus added to the population* at these periods, makes it amount to 93,601, at the close of 1800. At this rate it would have doubled in twenty-five years.

The baptisms for the next ten years were 52,012, the burials 25,242. The surplus raises the population to 120,371, at the close of 1810 ; a rate of increase that would cause it to double in $27\frac{1}{2}$ years.

The baptisms from 1810, to 1820, were 64,825 ; the burials 32,085. The increase in the natural way raises the population at the close of 1820, to 153,111. At this rate it would only double in $28\frac{4}{5}$ years. The calculated population however, at this period, is 156,310 ; taking the census of 1825 as one point, and the population, as shewn by the natural increase at the close of 1800, for the other. At the rate of increase deduced from the calculation, it would have doubled in very little more than twenty-seven years.†

* That of Quebec calculated according to the rate of increase between 1784 and 1790.

† I have taken 1800 as one point of my calculation in preference to 1810.—Because, though the population by the natural increase at the latter period exceeds the calulated number, when the census of 1784 and 1825 are the bases of

In each of these periods we perceive that there has been an increase of the number of burials compared with the baptisms. In the first they were as 45½ to 100; in the second as 48½ to 100; and in the third as 49½ to 100. In the five years from 1826 to 1830, the ratio in the same districts was 51½ to 100.

This increase in the ratio of burials to baptisms, seems partly owing to immigration, and in some measure also to an increase of mortality in the City of Quebec, which bears a large proportion to the total mortality of the districts under consideration. In the five years from 1796 to 1800, the burials in Quebec, were to the baptisms as 67 to 100. From 1806 to 1810, as 76, 29 to 100; from 1816 to 1820, as 80, 24 to 100; and finally from 1826 to 1830, as 76, 28 to 100. Though in the last period the rate of mortality in Quebec had considerably increased, the births had increased in a still greater proportion.

The total number of male children baptized in both districts prior to 1822, is 80,756; of females 75,712. The proportion is 106, 65 to 100, or 16 to 15. In the district of Three Rivers (consisting almost wholly of country parishes,) the males were 23,001, the females 21,326. The proportion is 107, 86 to 100, or 14 to 13. In the City of Quebec, the baptisms from 1794 to 1821, were 9,976 males, and 9,520 females. The proportion 104, 8 to 100, or 22 to 21.

the calculation, it falls short of it, when the calculation is made between the population by the natural increase in 1300, and the census of 1825. Thus shewing in some degree the effect of immigration, which began to be perceptible about that time. The population of the two districts in 1825 was 175,425. I had some difficulty in ascertaining it, in consequence of the changes made in the division of the province by counties.

The total burials during the same period, were 40,486 males, and 35,370 females; 114, 46 to 100, or 8 to 7. In the district of Three Rivers, 10,411 males, and 9,591 females; 108, 55 to 100, or 13 to 12. In the town of Quebec, 8,623 males, and 6,641 females; 129, 84 to 100, or 13 to 10.*

The registers of baptisms in the whole Province since 1825, shew a proportion of 20 males to 19 females; the country parishes 17 males to 16 females; the towns 30 males to 29 females.†

The registers of burials in the Province since 1825, shew a proportion of 6 males to 5 females; in the towns more than 5 males to 4 females; in the country 7 to 6.—This however includes 1832, the season of cholera, which carried off a much larger proportion of males than females. If we exclude 1832, the proportions will be in the Province, 7 males to 6 females; in the towns 6 to 5, in the country 8 to 7.

The ratio of burials to baptisms from 1825 to 1831 inclusive, is 49, 64 to 100; in the towns 76, 5 to 100; in the country 44, 38 to 100. These proportions correspond very closely with those observed in the Districts of Quebec and Three Rivers alone, between 1810 and 1820.

The relative proportion of births and burials tends to make the number of males greater than that of females in the country; whilst in the town it tends to make the females

* The great comparative excess in the mortality of males in Quebec, was found chiefly in the Protestant congregations, including the principal part of the soldiers, sailors, and other strangers. The average burials was nearly two male Protestants to one female; whilst amongst the Catholics they were as 11 to 10.

† In the town of Montreal, the number of males born from 1826 to 1831, was 4,868; of females 4,927. In 1832 the females births were only 798, the males 934; but in 1833 the male births were 866, the female 951.

more numerous than the males. As something approaching this occurs in all great towns, it is probably one of the principal causes of the excess of female population observed in them.

An examination of the late census of Quebec and Montreal, which have been made with greater care than that of the country places, shews that the males in each town are less numerous than the females. But, as I have already remarked, there is no certain information on this head, as regards the country generally. In the Curés' returns in 1790, the males in the Country Parishes of Quebec and Three Rivers were 32,234; the females 31,023. In the census of 1784, the males of all ages are 54,064; the females 50,759. These last numbers do not include servants, the infirm, and slaves, who were not classed according to their sexes.

In calculating the annual rates of baptisms, marriages, and burials, I have chosen the periods at which they were calculated for the Report of the Population Committee of the House of Commons in 1831. For though we have not the advantage of a census at the end of each period, the reason which induced Mr. Rickman to select them for the report; still they are not only as good as any others, but may be of some use, as enabling us to see what relation our progress in these respects bears to that of one of the densest, and certainly the healthiest community in Europe.

The population of the Districts of Quebec and Three Rivers at the close of 1795, was 82,455, at the close of 1800, 93,601.* The mean 88,028. If we add to this 2000

* These of course can be only approximations. I may remark, however, that in making the calculations, I always adopted the mode that gave the greatest number; as I thought, by so doing, I was less likely to fall into any error, in consequence of the uncertainty of the amount of Emigration.

for soldiers and sailors, it will amount to 90,028. The baptisms in the intervening period were 21,201, giving an annual mean of 4,240, or one in 21 .23. The burials 9,538. Mean 1,908, or one in 47 .18. The marriages 3,532. Mean 706, or one in 127 .66.

The mean population of 1806 and 1810, allowing 3,000 for soldiers, sailors, &c. was 116,089. The annual mean of baptisms 5,583, one in 20 .79. The annual mean of burials 2,671, one in 43 .46. The annual mean of marriages 1,017, one in 114 .15

The mean population of 1816 and 1820, with the same allowance for soldiers, sailors, &c., was 149,560. The annual mean of baptisms 6,851, one in 21 .83. Annual mean of burials 3,286, one in 45 .5. Annual mean of marriages 1,180, one in 126 .74.

The mean population of the same districts between 1826 and 1830, with 3,500 for soldiers, sailors, &c. was 194,786. The annual mean of baptisms 9,440, one in 20 .63. Annual mean of burials 4,878, one in 39 .93. Annual mean of marriages 1,786, one in 109.

The mean population of the Province, exclusive of the District of Gaspé,* between 1826 and 1830, was 457,200; adding 5,000 for soldiers, sailors, &c. it becomes 462,200.†

* The registers from Gaspé are only for three years, and apparently defective

† The highest numbers allowed for sailors alone was only 1,000. As the number coming to the ports of Quebec and Montreal in one year did not exceed 12,000, if each on an average is supposed to remain one month, they will equal a resident population of 1,000 men. This allowance will not be thought too small on the present occasion, when we consider that these are persons generally in the prime of life, and accustomed to a healthy employment, and consequently not likely to add near so much to the mortality, and certainly not to the births, as an equal number of residents of both sexes, and all ages. The nnmber of soldiers and their families is easily ascertained. The remainder to the round number is an

The annual mean of baptisms were 21,583, one in 21 .41. The annual mean of burials 10,517, one in 43 .95. The annual mean of marriages 3,890, one in 118 .8.

The lowest rate of mortality was in the years 1799 and 1816; in the first it was equal to one in 52 .72; in the latter to one in 54 .3. The greatest mortality occurred in 1810 and 1820; in the first it amounted to one in 33 .14, in the other to one in 34 .5. In the District of Montreal in 1820 and 1821, the mean mortality was equal to one in 36 .91. Some portions of the District suffered most in one of these years, some in the other.

The greatest proportion of marriages occurred in 1812, when they equalled one in 97 of the population. This increase of marriages during war, so contrary to what has been observed elsewhere, is said to have been the consequence of immunities from militia service, allowed to married men by the laws of the colony.

The following summary shews all at one view. I have placed the results of the English returns below it, for the purpose of comparison:—

	Districts of Quebec and Three Rivers.				*The Province.*
	1796 to 1800,	1806 to 1810,	1816 to 1820,	1826 to 1830,	1826 to 1830,
Births,—one in	21¼,	20¾,	21¾,	20½,	22 2-5,
Burials, "	47 1-5,	43½,	45½,	40,	44,
Marriages "	127 1-3,	114 1-7,	126¾,	109,	118¾,

England,

1796 to 1800,	1806 to 1810,	1816 to 1820,	1826 to 1830,
Births,—one in 36,	one in 34,	one in 35,	one in 37,
Burials, " 48,	" 51,	" 57,	" 54,
Marriages " 123,	" 122,	" 127,	" 129,

allowance for other temporary residents. When we consider that, of the Emigrants who are on their way to the upper province, many never land at Quebec; and that few of them remain more than a very short time there, the allowance made will probably be found fully equal to their influence on the registers in ordinary years.

The proportion of births in Canada to the population was nearly equal for all the periods, whilst the rate of mortality increased, contrary to what occurred in England at the same times. The average number of marriages fluctuated a good deal, and the mean ratio did not exceed that of England in so great a degree as might be supposed. The greater frequency of marriages in the Province would be better shewn if the ratio in both countries was drawn only by a comparison with the number of persons of a marriageable age. There is also a considerable difference in the productiveness of marriages in the new and old country, in England it is very little more than four children to each marriage, it is six in Canada.*

Doctor Price's rule for finding the expectation of life, or mean life, was to take a mean betweeen the annual rate of births and burials; but late investigations in England, led Mr. Malthus to consider that it is nearer the annual rate of mortality, and consequently longer than what is given by Dr. Price's rule. Mr. Malthus however states, that the mean life at any period is equal to the time which elapses until the mean mortality of a certain number of years, equals the mean births of a similar previous period. Guided by this rule, if we take the mean of births in the district of Three Rivers for the four years, from 1791 to 1794, it is found to be 860. The mean of burials of four

* The numbers obtained by comparing the marriages of 20 years (from 1796 to 1816) with the births of an equal period four years later was 6 1-5. I have struck off the fraction as a compensation for illegitimate births. This might be considered too small a reduction; but, as, when the numbers of children to each marriage is so great, the fruitfulness of marriages might be more correctly estimated by taking a greater interval than four years between them and the births, the average numbers assigned here to each marriage will not appear too high.

years, from 1819 to 1822, is 905. This would seem to shew a mean life of rather less than 28 years. The mean of births in the districts of Quebec and Three Rivers, during the five years, from 1801 to 1805, was 4,819; the mean of burials, from 1826 to 1830, was 4,863; indicating a mean life of 25 years. In the district of Quebec alone, the mean of births for three years, from 1794 to 1796, was 3,008, the mean of burials for 1819, 20, and 21, was 3,069; indicating a mean life under 25 years. If three years is considered too small for an average, and we take the mean births in the district for seven years, from 1803 to 1809, the number is 3,892; the mean of burials for seven years, from 1825 to 1831, was 3,928; seeming to indicate a mean life in the district of Quebec of less than 22 years.

As in all cases a portion of the mortality must have been furnished by immigrants, the mean life thus estimated, would be evidently too low, still making a large allowance for the increase of mortality from this cause, the mean life thus obtained would not be greater, perhaps not equal to the result of Dr. Price's rule, or 32½ years. Thus the baptisms in both districts, from 1794 to 1798, were 20,296; the burials thirty-two years later, from 1826 to 1830, were 24,317. As the population in 1821, by the highest calculation, was only 2600 more than the natural increase, and as the number of immigrants, who settled in the Province between 1826 and 1830, was not very considerable,* we

* In the census of 1831, this number of emigrants stated to have arrived in the Province since 1825, is 23,291, exclusive of Gaspé. But if the excess of births over burials between the censuses is added to the population of 1825, the difference between it and the total number by the census of 1831, is found to be only 14,407, which if both censuses were correct is all that could be allowed for immigration. Is it probable that the persons employed in taking the census included in the number of Immigrants not only the individuals who came into the country, but also their children born since their arrival? Can there be an emigration, to any extent, from the province?

can scarcely suppose that the surplus remaining in these districts, together with their descendants born since their arrival, would add one-fifth to the mortality of the native inhabitants.

If, on the other hand, we endeavour to ascertain what proportion of those baptized live to marry; and compare, for that purpose, the baptisms of a period of years, with the marriages of an equal period, 24 or 25 years later; the influence of immigration will tend to make the proportion appear larger than it really is. The total baptisms from 1801 to 1805 were 24,096; from 1802 to 1806, 25,015. The marriages from 1826 to 1830 were 8,930. If we take from the marriages the usual allowance of a sixth for second and third marriages, the number left for first marriages is 7,442. If we suppose the average age of marriages to be 24 years, nearly three-fifths of those born would seem to live to marry; and a still greater proportion if the mean age of marriage was 25 years.

A return of all the deaths in the Province for several years, classed, as is often done in other countries, according to the ages of the deceased, would be very useful in many respects, particularly in assisting us to estimate both the probability, and expectation of life.

It is a subject of general remark that cities and towns are more unhealthy than the surrounding country: and for the most part the rate of mortality in towns is considered to bear some relation to their size. Even on a small scale, the simple circumstance of many people living in the same building or apartment, though not crowded, seems to be inimical to health. Thus, the average mortality is observed to be greater in large hospitals than in small ones; and in the same hospital, greater in the large wards than in the

small.* Perhaps in no place or country is the truth of this observation more conspicuous than in Canada; the average mortality of the towns being nearly double that of the country. The following summary of the mean births, burials and marriages in the city of Quebec, may be compared with those already given for the districts, as the periods in both are the same :—

	1796 to 1800,	1806 to 1810,	1816 to 1820,	1826 to 1830,
Births,—one in	24½,	one in 22½.	one in 21¾,	one in 17¾.
Burials, "	36½,	" 29½,	" 27 1-5,	" 23 1-3.
Marriages, "	130,	" 105,	" 100½,	" 88 2-5.

To the calculated population in the first period 2000 is added for military and sailors, making the whole 11,850. To the second 3,000 is added, as the number of troops was increased, making in all 16,278. The total number in the third period with the same addition (for though the troops were fewer, the shipping, &c. was increased) was 20,898. In the fourth we have the mean of the censuses of 1825 and 1831, which, with 3,500 for soldiers, &c. amounts to 28,639.

The mean population of the city of Montreal by the census of 1825 and 1831 was 29,572, to which may be added 1,500 for soldiers, sailors, &c. The mean annual baptisms between 1826 and 1830 were 1,557, or one in 19 .95. The mean burials 1,125, one in 27 .62. Mean of marriages 347, one in 98 .18.

The mean population of the town of Three Rivers between 1825 and 1831 was 3,550. The mean annual baptisms from 1826 to 1830 were 186, one in 19. Mean burials 101, one in 35 .15. Mean marriages 34, one in 104 .4.

* Hawkins' Medical Statistics.

The annual mortality varied, in Quebec, from one in 18 in 1831, to one in 28 .2 in 1828: in Montreal, from one in 21 in 1831, to one in 28 .93 in 1828 : in Three Rivers, from one in 24 in 1826, to one in 46 .43 in 1829.

If to the calculated population of Quebec in 1832, we add as before 3,500 for soldiers, sailors, &c. it becomes 32,956. The deaths in that year were 2,611 males, and 1,430 females. The proportion one in 8 .15. The population of Montreal for the same year, with the addition of 1,500 for soldiers, &c. was 34,164. The deaths 2,096 males, and 1,817 females. The proportion one in 8 .73.* In Three Rivers, where cholera did not prevail, the deaths were 88 males, and 65 females; being one in 27 of the population.

In 1832 the mortality in the country parishes of the districts of Quebec and Three Rivers was equal to one in 42.8; in the district of Montreal to one in 30 .1. But if we examine the two previous years, we find that the country parishes of Montreal were healthy, whilst there was a considerable mortality in those of Quebec and Three Rivers. In the populous Island of Orleans, within three nautical miles of Quebec, the mortality in 1832 was only equal to one in 59 .94; being less than in any of the seven preceding years.

The following is the annual rate of burials in the country parishes of the several districts between 1826 and 1832:—

	1826,	1827,	1828,	1829,	1830,	1831,	1832,
Quebec,—one in	41 .47,	45 .91,	48 .43,	53 .77,	35 .96,	37 .86,	42 ,0,
Three Rivers, one in	37 .63,	54 .0,	55 .33,	67 .0,	43 .27,	48 .60,	44 .8,
Montreal, one in	44 .0,	50 .0,	50 .6,	61 .0,	56 .61,	51 .42,	30 .1.

* In these calculations the passing emigrants are not estimated, from the difficulty of ascertaining what allowance could be made for them. It is stated by Mr. Buchanan that upwards of 2,000 emigrants died of cholera in 1832; and it is certain that the chief part of these deaths occurred in Quebec and Montreal.

We seldom find an increased mortality in all parts of the Province in any one year. In examining the registers in detail, I observed in some years an increased mortality in all the parishes along the river, save a few at one or other extreme; but those had an increased mortality in the previous or ensuing year, whilst the others were healthy.

The increase of mortality in any particular years seemed to be rather owing to the spread of disease from endemic, or other causes, than to any distress arising from scarcity of food. In 1828, and 1829, which were remarkable for a comparatively small number of burials in the northern division of the district of Quebec, some places in this part of the district, were reported to be in great distress from the failure of the crops; and similar reports were made at the close of 1816, which was remarkable for a low rate of mortality. The varied rate of mortality, in a series of years, in the different parts of the Province, is probably in part owing to accidental causes, the effects of which are more conspicuous as the community is small. If it depends on any endemic influence, it is rather singular that it should travel so slowly.

In estimating the healthiness of any place or period by the annual rate of mortality, the years of pestilence ought not to be excluded; for the severity of epidemics seems to bear some relation to the usual healthiness or unhealthiness of the places they visit. Now, if instead of estimating the healthiness of the towns of Lower Canada at present, by the mortality of the five years from 1826 to 1830, we take all the consecutive years of which the registers have been published, up to and including 1832; the ratio, already high, will be greatly increased. Before stating the results, however, it is proper to observe, that though the general

principle of including years of pestilence in our estimates, is correct, yet, when they occur rarely, they ought only to be taken in connexion with the returns of many ordinary years, certainly of more than seven or eight as in the present instance, and rather with the years that follow, than those which precede their occurrence.

The annual average mortality in the city of Quebec from 1825 to 1832 was one in 18.4. In Montreal from 1826 to 1832 one in 19.95. In Three Rivers one in 32.7.

The high rate of mortality is not altogether confined to the last few years: for in 1810 the mortality in the city of Quebec was one in 19; in 1820, one in 24. On the other hand, in 1798, it was one in 44; in 1816, one in 35.*

It has been already stated that the mortality in cities generally bears a ratio to their size. But as it is still more influenced by the general state of prosperity or misery; the towns, in which trade is brisk, and employment consequently easily procured, are found to be more healthy than less populous ones under opposite circumstances. The rate of mortality in London, and many other towns in England, is

* The returns for 1833 have just been sent in. They are particularly interesting in consequence of this being the year immediately succeeding the epidemic.—From the number of infirm persons cut off in the preceding year we expected that the mortality of this would be much below the usual rate. We find, however, that the deaths in Quebec were 741 males, and 530 females; in Montreal 703 males, and 603 females: in Three Rivers 47 males, and 45 females. If we suppose that the influx of immigrants and persons from the country had already compensated for the mortality of 1832, and that the population of the towns of Quebec and Montreal had consequently not been reduced; the ratio of the deaths to the population in both towns in 1833, was one in 26; in Three Rivers, supposing its increase unchecked, one in 46.76. The total return of deaths in the province (exclusive of Gaspé) is 5,870 males, and 4,913 females. Eight congregations, the mortality of which on previous years, was about 480 persons of both sexes, had not yet sent in their returns.—The whole mortality of the province in 1833, may be estimated as one in 47.

not half so high at present as in the middle of the last century; though their population is more than doubled. In Amsterdam, which has suffered from the decline of trade, the ratio of mortality has increased during the same period, whilst the population has diminished. From these considerations we are led to enquire how it happens, that the ratio of mortality has been increasing in Quebec during the last thirty years, notwithstanding its advances during the time in commercial prosperity.

In England, with the increase of wealth, there was an increased attention to the general police of the cities. The streets were cleansed, drained and paved; they were ventilated also, or at least pure air was more freely admitted by widening them, and an abundant supply of water, brought to every house, encouraged cleanliness within doors. Let us look to Quebec in some of these respects.—Within the walls the paving is tolerably good; but there has been as yet no regular system of cleansing the streets. The public sewers are in such a state, that some houses, in one of the principal streets, are scarcely habitable at times, in consequence of the stench proceeding from the sewers, and the mode in which several of them open in the Lower Town is most offensive. The suburbs, with few exceptions beyond the streets that form thoroughfares, or avenues to the country, have neither the advantage of paving or sewers. Prior to 1832 some of the streets in the suburbs were disgustingly filthy; and at certain seasons some are still barely passable by help of the logs that are laid in place of curb stones. * After the melting of the snows in April and May, several streets in the flat suburb of St. Rochs are no better than sloughs; and very offensive sloughs too, from the accumulated filth that was hidden by the snow in

winter. Such places when acted on by the summer's sun must give out very noxious effluvia, capable of tainting the air to some distance from their source. The dread of cholera has caused some attention to be directed to the cleansing of the streets, and the same disgusting filth does not now meet the eye in passing through them; but little has been yet effected towards the equally material objects of paving and draining. Here are abundant causes of sickness; and when we add to them, the situation of the labouring poor, chiefly composed of immigrants, many of whom arrive here in a state of destitution; that their usual disposition to crowd together in their wretched habitations, is increased by the high rate of house rent, and the expense of fuel in winter; and that the filth usual in such circumstances is augmented in consequence of the want of a ready supply of water; we cannot be surprised at the frequency of disease and death.

Little attention has been hitherto paid by the inhabitants of Quebec to any cause of disease, save that arising from the state of the labouring poor. The town is considered very healthy, and nothing but a comparison of the mortality in it, with that of other places, can dispel the illusion.— But there is reason to hope that this unhealthy state will not be permanent. The situation of the Upper Town seems very favorable to health, and there is nothing unfavorable arising from the situation of the lower part of the town, which may not be removed or mitigated. When the main sewers are made of a sufficient depth, properly constructed, and carried without interruption to the rivers, the cleansing and draining will be easily effected. The streets of the suburbs will be gradually paved; though it is probable that the process will be slow, as the necessity does

not seem so urgent for the ordinary purposes of life, in consequence of the snow roads which serve so well during that half of the year, when roads are worst in other countries. What has been already done in Montreal shews that the severity of the winter need not prevent a supply of water from being sent in pipes through the town. If, however, this mode should seem too difficult or uncertain, some other means might surely be devised for affording a more ready supply of good water to the poor. It is the more called for, as the scarcity of water is perhaps the only one of the sources of disease peculiar to them, that can be met by municipal regulations. Those things can only be done at a considerable expense; but the object to be attained is worth any pecuniary sacrifice. Those, who may be chiefly called on to contribute, will do well to recollect, that when disease begins among the poor, it sooner or later spreads to the rich.

The causes of the high rate of mortality in Montreal are probably much the same as in Quebec. A cursory examination of the suburbs shews that much remains to be done there also, in the way of cleansing, paving and draining; and the benefits of the water works are, as yet, wholly confined to those who can afford to pay for them.

In 1833 returns were made to the House of Assembly of the baptisms, marriages, and burials in the Province during each month of the four preceding years. The substance of these is arranged here in a tabular form. I have separated the returns of the cities from those of the country parishes, and the ordinary years from the year of the epidemic.

Baptisms in the Province from 1829 *to* 1832.

Country parishes.	Jany.	Feby.	March	April.	May.	June.	July.	Augt.	Sept.	Oct.	Nov.	Decr.
	6430	6240	7400	6741	6979	6616	7157	6882	6958	6889	6318	6131
Towns	1105	1052	1121	992	1220	1317	1800	1341	1195	1174	1008	1098

Burials in the Province.

Country parishes,	Jany.	Feby.	March	April.	May.	June.	July.	Augt.	Sept.	Oct.	Nov.	Decr.
1829-30. & 31.	1842	1994	2262	2181	2221	2199	2963	2789	2197	1894	1737	1825
1832.	596	677	823	966	991	1373	1808	3216	1512	920	637	563
Quebec, 1829-30, & 31.	243	232	240	236	274	422	544	577	406	339	344	337
1832.	85	78	74	66	111	1366	650	714	407	202	133	94
Montreal 1829-30, & 31.	267	243	228	206	257	321	546	565	346	330	285	320
1832.	114	106	150	167	172	1130	663	740	295	149	115	112

In the country the greatest number of births occurred in March, of deaths in July and August; the least number both of births and deaths in November, December, January, and February. In the towns the greatest number both of births and deaths occurred in June, July, and August, the least in the winter months. In 1832 we find that the increased mortality commenced in March, though cholera did not appear until June. The increased mortality in the spring was chiefly in the city and district of Montreal, where in March it amounted to nearly one-half more than the mean of the three preceding years; it increased still more in April, and in May it was nearly double. In December the rate of mortality was below the average of the same month in the preceding years.

A physician is here led to inquire, what are the diseases that cause such an increase of mortality both in town and country during the summer months; for if they were known their causes might be examined into, and perhaps measures suggested for lessening their frequency and fatality.

This information can only be obtained, as respects the country parishes, by reports from the local medical practioners. In the towns we are led to expect the most useful information in hospital records. In having recourse to these in Quebec, however, my expectations were very much diappointed. My attention was first directed to the Hotel Dieu and General Hospital, which, on account of their long standing, seemed likely to afford the necessary information, free from the uncertainty that is attached to the results obtained from establishments of recent origin, in consequence of the occasional prevalence of particular diseases. But, as persons labouring under diseases supposed to be infectious, are not admitted into either of these hospitals, their records, however, valuable in other respects, could not be very useful on the present occasion.

My next recourse was to the Emigrant Hospital. The patients in this establishment, not being inured to the climate, are likely to suffer more than others from any cause of disease dependant on the seasons. The state of poverty and destitution, in which many of them arrive, render them peculiarly liable to be effected by any cause of disease in existence at the time ; hence a knowledge of the diseases most fatal to them, could not fail to throw great light on the nature of the endemics of the Province. The records of this hospital, however, have been kept, until very lately, in such a slovenly irregular manner, that little information can be obtained from them. The principal part of the mortality amongst the emigrants in summer, as far as it can be collected from the hospital books, appears to be owing to fevers and dysentery.

By the kindness of Doctor Skey, I have been afforded every facility in examining the medical records of the

army in Canada. As the information they contain is most accurate, and as the health of the troops in each year, bears a relation to the general health of the Province; these records are very valuable in assisting us to form an opinion respecting the diseases of the different seasons.— The following table shews the hospital admissions and deaths in the Army in Lower Canada, during each quarter of the year, from 1820 to 1827. I have distinguished the diseases that usually depend on climate or season, or that have been remarkable for frequency, or fatality. The remainder are included under one general head. The first quarter extends from the 21st of December to the 20th of March, the second from the 21st of March to the 20th of June, the third from the 21st of June to the 20th of September, the fourth from the 20th of September to the 20th of December.

1820 to 1827.	Fevers.		Pneumonia.		Rhumatism.		Phthisis and Hemoptysis.		Catarrh, acute, and chronic.		Dysentery and Diarrhœa.		Other Diseases.		Total.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st quarter.	332	10	246	5	101	0	41	20	349	5	109	1	1808	15	2986	56
2d do.	747	3	328	14	163	0	39	27	365	3	176	0	2034	11	3852	58
3d do.	1051	9	189	9	158	0	21	17	245	1	659	1	3057	23	5380	60
4th do.	539	13	216	2	128	0	29	10	274	1	251	0	2214	17	3651	43
Total.	2669	35	979	30	550	0	130	74	1233	10	1195	2	9113	66	15869	217

The greatest number of deaths from diseases not specified were 14 from Apoplexy, arising chiefly from drinking inordinately of spirituous liquors; 8 from small pox; 6 from enteritis; 6 from dropsies; 6 from wounds and accidents, and 4 from atrophia. Except the deaths from Enteritis,

five of which occurred in the first quarter, none of them appear to belong to any particular season. The admissions both with Apoplexy and Enteritis very little exceeded the deaths.

The number admitted with fevers in the second and third quarter, was more than double that of the first and fourth; whilst the mortality scarcely exceeded one half. The mortality from Pneumonia on the contrary was greater, and Rheumatism was more prevalent in the spring and summer, than in the winter. These results are, I believe, contrary to popular opinion, and perhaps to popular experience.

The following shews the ratio of mortality in the army in Lower Canada from 1820 to 1831 :—

Year.	Mortality per cent.	Year.	Mortality per cent.
1820	1.109	1826	1.842
1821	1.120	1827	2.132
1822	1.124	1828	0.574
1823	1.397	1829	0.626
1824	1.574	1830	1.303
1825	1.674	1831	1.681

The mean annual mortality was 1,333 per cent. The mean during the same period in Upper Canada was 1,253 per cent.*— The mortality was considerable in the upper province in 1828 and 1829, when the troops in the lower province were healthy. It was pretty equal in both in 1830; but in 1831 it was light in the upper province, (only one per cent) whilst it was above the average in the lower. This circumstance bears a resemblance to what has been already remarked respecting the progress of disease in the different districts of Lower Canada.

* This alone cannot be considered a proof of superior healthiness in the upper province, as some (though probably very few) of the persons who died in the military hospitals of Quebec were invalids, on their way home from Upper Canada.

The annexed table shews the mortality by different diseases in the military hospitals of both Canadas from 1810 to 1822. Though it does not assist our enquiry into the diseases of different seasons; yet it is valuable in other respects, particularly in enabling us to estimate the prevalence or mortality of particular diseases at different periods. It is copied from one prepared for the Army Medical Department, the only alteration I have made is the condensing under one head several diseases of comparatively infrequent occurrence, and adding a column of per centage ·—

General Abstract of deaths in Hospitals of the Army serving in Canada, from the 21st of December, 1809, to 20th December, 1822.

Years.	Average strength of the Army during each year.	Number of sick admitted during each year.	Total number of sick treated during each year.	Diseases.															
				Fevers.	Pneumonia.	Enteritis.	Hepatitis.	Variola.	Rubcola.	Phthisis and Hemoplysis.	Catarrh.	Dysentery.	Diarrhœa.	Apoplexy.	Dropsies.	Wounds and Accidents.	Other Diseases.	Total Mortality.	Mortality per cent.
1810	4183	4835	5142	32	33	..	..	..	..	..	..	10	1	..	..	13	..	89	2.128
1811	4426	5616	6074	60	16	..	..	..	..	..	4	2	..	..	..	10	7	99	2.237
1812	6140	8424	8852	48	55	..	..	..	1	22	22	14	20	..	5	13	10	210	3.257
1813	13698	17748	18831	201	96	9	1	11	3	31	..	51	16	3	11	64	9	506	3.694
1814	23393	29230	30489	241	109	5	..	39	2	59	5	159	30	1	16	180	23	869	3.714
1815	16346	6816	15325	122	59	2	1	1	2	55	..	47	11	3	6	9	34	352	2.153
1816	6130	6177	6807	12	16	2	1	..	..	15	..	6	..	3	4	2	8	69	1.093
1817	4671	4176	4576	14	11	..	..	..	..	16	4	16	1	..	3	5	13	83	1.777
1818	4170	3493	3762	7	6	4	..	..	..	16	2	5	..	4	4	5	6	59	1.414
1819	3790	3063	3370	6	5	..	3	..	..	8	..	..	..	..	1	1	4	33	0.898
1820	3341	3281	4562	2	10	..	..	1	..	4	1	..	..	..	1	5	5	29	0.868
1821	3316	3503	3796	9	9	1	1	..	..	9	1	..	1	1	..	3	1	36	0.086
1822	3276	3153	3297	4	4	1	..	..	..	8	3	..	..	2	1	..	4	27	0.824
	99485	99485	114883	758	429	24	7	52	8	243	49	315	80	18	52	310	124	2461	2.540

If we compare this table with the table in page 207, we observe that the deaths from consumption, between 1810 and 1822, bore a much smaller proportion to the whole mortality, than from 1820 to 1827.* In the first period the amount is under 10 per cent. in the last 34. Excluding from the former the returns of 1812 to 1815, when the war and its consequences added so much to the whole mortality, the proportion of deaths from Phthisis is still only 12 .6 per cent.

As it seems very difficult to account for such a disparity in the proportion of deaths from Phthisis in men under the same circumstances; we might suspect that it arose from diseases of the chest not being so accurately distinguished formerly, as they have been of late. But if any error in this respect existed, it would, most probably, be rather in applying the name of consumption to diseases which do not strictly come under that head, than in withholding it, and so far would tend to lessen, rather than increase the disparity.

If, in order to avoid any error which might arise from this cause, the deaths from all diseases of the chest in both periods are compared, they are found in the first to be 29 .2 per cent, of the whole, but deducting the period of war, as before, 43 .5 per cent. In the latter period they are 52 .53 per cent. Thus, whatever the cause may be, the deaths from pulmonary disease appear to have increased.† The

* The deaths from Phthisis in the army in both Canadas from 1820 to 1831, was 33 per cent of the whole mortality.

† I have dwelt more on this subject from having formerly seen it stated (I think in the Edinburgh Medical Journal) by a Medical Officer who had served in Canada, that the climate, contrary to what might be supposed, was favorable to persons of consumptive habit, and that soldiers who arrived in the incipient state of the disease, were frequently restored to health.

deaths from Dysentery and Diarrhœa, on the contrary, bear a much less proportion to the whole in the latter period than the former, even if the years of war are excluded. This is probably owing, at least in part, to an improved mode of medical treatment.

From the scanty information I have as yet been able to obtain, no conclusion can be drawn respecting the diseases that cause the increase of mortality in summer. Fevers and bowel complaints would seem to be the most prevalent diseases in the towns in this season: for under these heads are the principal part of the admissions and deaths in the only hospital that receives cases of every description; and the same diseases are also very prevalent amongst the military, though from being early attended to, and from the better condition of the men, they are seldom fatal. It is asserted that a principal part of the deaths in summer occurs in young children; but we have no returns by which it might be ascertained.

Whatever the diseases may be, there is reason for suspecting that many of them are produced by exhalations from the soil disengaged by the intense heat of the season. It is now generally admitted that Dysentery often proceeds from this source, and continued fevers seem to be frequently the consequence of Miasmata in countries, and seasons in which intermittents do not prevail; though the latter as being the most obvious effect of Malaria, are usually the only fevers attributed to it. It may be mentioned, as bearing on the subject, that in places where Malaria prevails, it has been ascertained that a more than ordinary proportion of the mortality occurs in the early periods of life.

If these views are correct, there is reason to hope for a gradual improvement in the health, and a prolongation of

the average life of the inhabitants both of town and country; in the one by an enlightened police, and in the other as a consequence of the drainage that must accompany an improved and extended system of cultivation.

I have endeavored to point out what seem to be the most obvious causes of disease, but probably not the only, nor perhaps the chief ones. The medical practitioners, who in the discharge of their duties, frequently visit the abodes of the poor, may see others that escape the eye of one who has, comparatively, few opportunities of observing them. Be this as it may, it is certain that the mortality in the towns of Lower Canada is very great, and calls imperatively for the utmost exertions of all classes to remove or lessen any source of disease that can be clearly pointed out.