

been met with in the pleasant circle of such divines as Bishop Law and Dr. Paley; indeed, it is gratifying to add, that the Carlisle episcopate of that day was most ably represented. Neither talents, nor amiability, nor the art of good preaching were wanting in its leading men, who, in classic attainments, in literature, and theology, ranked with the best of England. Dating from the advent of Bishop Law in 1767 to the active days of Dean Milner early in the present century, the Carlisle diocese numbered among its superior clergy men of high eminence and merit.

CHAPTER III.

THE CARLISLE BILLS OF MORTALITY—TOPOGRAPHY—CLIMATE AND RAINFALL—CENSUS OF 1763 AND 1780—NOTES ON THE MORTALITY FROM 1779 TO 1787.

DR. HEYSHAM had only been a few months in Carlisle when he meditated a census of the inhabitants, and the framing of bills of mortality. He prefaced his observations on the advantages to be derived from accurate registers of mortality by the following passages from Percival's *Essays*, vol. ii.—“The establishment of a judicious and accurate register of the births and burials in every town and parish, would be attended with the most important advantages, medical, political, and moral. By such an institution the increase or decrease of certain diseases, the comparative healthiness of different situations, climates, and seasons; the influence of particular trades and manufactures on longevity; with many other curious circumstances, not more interesting to physicians than beneficial to mankind, would be ascertained with tolerable precision. In a political point of view, exact registers of human mortality are of still greater consequence, as the number of people and progress of population in

the kingdom, may, in the most easy and unexceptionable manner, be deduced from them. They are the foundation, likewise, of all calculations concerning the value of assurances on lives, reversionary payments, and of every scheme for providing annuities for widows, and persons in old age. In a moral light such *Tables* are of evident utility, as the increase of vice or virtue may be determined by observing the proportion which the diseases arising from luxury, intemperance, and other similar causes, bear to the rest; and in what particular places distempers of this class are found to be most fatal."

Carlisle, in $54^{\circ} 53'$ N. lat., $2^{\circ} 55'$ W. long., is pleasantly situated on a slightly rising ground, on the south bank of the river Eden, and about five miles above the junction of that river with the tides of the Solway Firth. The Cauda, a mountainous stream, runs within 150 yards of the ancient city on its west side, and the more sluggish Peterill courses about a mile to the south and east; both streams join the broader Eden, so that Carlisle is placed at the confluence of three rivers, and almost surrounded by them. The tidal Eden is noted for its *Salmonidæ*, and the two tributaries for their special trout-fishing. Along the banks of each river are pleasant walks, from which the Carlisle citizen can obtain commanding views of richly cultivated lands, bounded by elevated mountain-heights, upon which the lights and shadows of a northern sky play with charming fitful beauty.

The subsoil of Carlisle and its immediate vicinity varies a good deal; sandy or gravelly loam, or these associated with clay, predominate: they rest on the red sandstone. In some of the outlying townships there were tracts of moorish soils, somewhat barren, and in part only enclosed a hundred years ago; but all this is changed to-day. The meadows around the city are still liable to floods after heavy rains, but there are no stagnant waters and no marshes within or even near the municipal boundary. From the pastoral amphitheatre in which Carlisle is placed, the land rises gradually here and there in undulating line and knolled eminence, but more or less elevating till it assumes a strictly hilly aspect, which culminates about twenty or more miles distant in the mountain ranges of Skiddaw on the south-west, and Crossfell on the east, 3000 feet above the level of the sea. The land-slopes, the river-courses, the varying winds, but chiefly from the south-west, the proximity to the Solway's estuary, and other local conditions, showed favourably for the salubriousness of Carlisle. Dr. Heysham described the air pure and dry. The designation "dry" may seem hardly compatible with the cloudy or pluviose condition of an atmosphere more or less contiguous to the Lake District, proved to be the wettest in England. Dr. Carlyle, the father of the Rev. Mr. Carlyle, the Arabic scholar, kept an account of the quantity of rain which fell at Carlisle during a period of twenty years—namely, from 1757 to 1776

inclusive.* During this period the greatest quantity which fell in one year was 31.801 inches, the medium being 24.71 inches. Mr. Pitt made the mean quantity of rain fallen in Carlisle, from 1801 to 1824, 30.571 inches. The average rainfall of Carlisle is at present about 28 inches, thus approximating more to Pitt's observations than those of Dr. Carlyle.

Taking the local circumstances into account, Nature had been lavish in her gifts to the north-western extremity of the vale of Cumberland, in mountain, wood, and rivers; here elevations to the clouds, there a gradual fall to the water's brink. Man, however, failed to appreciate the advantages of a site upon which his sons and daughters might have realised, to the full, the poesy of the Psalmist and the blessings of health.

* Table of the quantity of Rain which fell at Carlisle during a period of Twenty years:—

Years.	Inches.	Years.	Inches.
1757 - - -	20.026	1768 - - -	31.801
1758 - - -	26.036	1769 - - -	21.803
1759 - - -	22.946	1770 - - -	25.122
1760 - - -	28.641	1771 - - -	23.982
1761 - - -	26.443	1772 - - -	28.518
1762 - - -	20.538	1773 - - -	28.233
1763 - - -	28.353	1774 - - -	19.344
1764 - - -	24.162	1775 - - -	29.132
1765 - - -	19.709	1776 - - -	21.690
1766 - - -	21.472		
1767 - - -	26.268	TOTAL - - -	494.219

Showing the medium quantity of these twenty years to be 24.71 inches.

In July 1763, at the request of Dr. Littleton, Bishop of Carlisle, the inhabitants were numbered with great care, and the city and suburbs contained 1059 families, and 4158 inhabitants.

Early in 1779 Dr. Heysham commenced his statistical observations, and set earnestly to work, from week to week and month to month, to record the births, marriages, the diseases, and deaths, of the inhabitants of Carlisle. The details and figures given by Heysham for each year would prove vastly too tedious for all but the dry-as-dust reader. A brief summary of the more prominent facts will, it is supposed, best illustrate the character of Heysham's mind, and the nature of his investigations, and, in all probability, satisfy the requirements of the statist.

It ought to be premised that Carlisle contains two parishes, St. Mary's and St. Cuthbert's, and that these parishes include the city, its suburbs, and certain outlying districts, with villages, the relative population of which divisions is particularly specified in the following page.

"In January 1780, a very careful and accurate survey was made by Mr. Stanger and Mr. Howard, under Dr. Heysham's own inspection, when there were found in the district before surveyed, 891 houses, 1605 families, and 6299 inhabitants. In addition to the city and suburbs, the villages contained 257 houses, 267 families, and 1378 inhabitants, as shown in the accompanying Table No. 1.

TABLE I.
Showing the POPULATION OF CARLISLE, ITS SUBURBS, and VILLAGE DISTRICT, in 1780.

Parishes of St. Mary and St. Cuthbert's.	Houses.	Families.	Males.	Females.	Total of both Sexes.	Houses.	Families.	Inhabitants.			
English Street	208	319	639	732	1371	} 549 Total within the Walls	} 870	} 3504			
Scotch Street	122	197	354	437	791						
Fisher Street	53	82	130	194	324						
Castle Street	81	143	220	307	527						
Abbey and Annetwell Street	77	121	173	270	443						
The Abbey	8	8	17	31	48						
Botchergate	95	202	385	457	842						
Rickergate	82	177	307	356	663						
Caldewgate	165	356	592	698	1290						
Newtown	16	19	40	52	92						
Harraby	9	10	31	41	72						
Carleton	30	30	66	67	133						
Wreay	17	18	56	58	114						
Brisco	32	34	107	85	192						
Botcherby	21	22	46	52	98						
Upperby	20	21	35	54	89						
Blackhall	63	64	176	178	354						
Cummersdale	22	22	60	50	110						
Morton Head and Newby	27	27	57	67	124						
Total in the two Parishes	1148	1872	3591	4186	7677	} 257 Total in the Villages	} 267	} 1378			
									} 342 Total without the Walls	} 735	} 2795
Females exceed Males 595. Males to Females as 1 is to 1 and 1-6th nearly.											

In Table No. II. he summarised the single and married persons thus :—

TABLE II.
Of the Number of HUSBANDS, WIVES, etc.

	Husbands.	Wives.	Widowers.	Widows.	Total.
Within the Walls	531	569	46	248	1394
Without the Walls	488	522	45	160	1215
In the Villages	188	191	17	68	464
	1207	1282	108	476	3073

Total of persons who are or have been married 3073
 Total of persons who are married 2489
 Total of persons who never were married 4604
 Total of unmarried persons 5188
 Widows exceed widowers 368
 Widowers to widows as 1 is to 4 and 3-7ths nearly.

The astonishing increase of 2141 inhabitants, above half of the original number in the city and suburbs, in the small space of seventeen years (1763-80), Heysham attributed to the establishment of calico-printing manufactories. There were four companies, who daily employed about 800 industrious poor in this kind of work. "This increase of population," Heysham remarked, "had taken place during that very period in which Dr. Price asserts the depopulation of Great Britain to have been rapid and progressive. And what makes this increase more remarkable, Car-

lisle has, during the whole period alluded to, been constantly supplying the army, the navy, the metropolis, and even the distant regions of India, with her hardy, active, and enterprising sons."

TABLE III.
Of DEATHS, AGES, and CONDITIONS.

AGES.	Males.	Females.	AGES.	Bachelors.	Husbands.	Widowers.	Maids.	Wives.	Widows.	TOTAL.
Under 1 month . . .	6	7								
Between 1 & 2 months	2	...	20.30	2	3	...	3	3	1	12
" 2 & 3 "	...	2	30.40	...	3	...	...	3	...	6
" 3 & 6 "	5	...	40.50	...	4	...	2	2	1	9
" 6 & 9 "	2	4	50.60	1	4	2	...	2	1	10
" 9 & 12 "	10	9	60.70	...	11	1	1	4	1	18
" 1 & 2 years old	21	12	70.80	...	3	3	1	...	7	14
" 2 & 3 "	17	19	80.90	...	1	3	1	1	6	12
" 3 & 4 "	10	8	90.100	...	...	...	1	1	...	2
" 4 & 5 "	6	10	Total of Ages and Conditions	3	29	9	9	16	17	83
" 5 & 10 "	7	7								
" 10 & 15 "	4	3								
" 15 & 20 "	2	2								
Total of the above ages	92	83								
				Total of ages under 20 years		Males 92 Females 83				175
				Total of all ages and conditions 258						

From Tables No. III. and No. IV., Heysham "could with pleasure demonstrate the extreme salubrity of Carlisle, even in a very unhealthy year (1779), in which no less than 129 persons were cut off by two epidemic disorders—smallpox and scarlet fever." He proceeded to compare Carlisle with other towns in England as well as on the Continent, and stated that "in Vienna about 1 in 19½ of the inhabitants die annually; in London,

TABLE IV.
DEATHS and DISEASES of PERSONS of Different Ages.

DISEASES.	Under 5 years.	Between 5 and 10 years.	Between 10 and 15 years.	Between 15 and 20 years.	Between 20 and 30 years.	Between 30 and 40 years.	Between 40 and 50 years.	Between 50 and 60 years.	Between 60 and 70 years.	Between 70 and 80 years.	Between 80 and 90 years.	Between 90 and 100 years.	TOTAL.
FEBRILE DISEASES—													
Inflammatory Fever . . .	3	...	...	...	...	...	...	...	...	...	...	...	3
Nervous Fever . . .	1	...	...	1	...	1	1	...	1	...	...	...	5
Pleurisy . . .	...	...	...	...	...	...	...	1	1	...	...	...	2
Inflammation of the stomach from large dose of steel filings	...	...	...	1	...	...	...	...	...	...	...	...	1
Rheumatism, chronic . . .	...	...	...	...	...	...	...	...	...	1	...	...	1
Gout . . .	...	...	...	...	...	...	...	1	...	1	...	...	2
Smallpox . . .	86	2	1	...	1	...	...	...	...	...	...	...	90
Miliary Fever . . .	...	...	...	...	1	...	...	...	...	...	...	...	1
Scarlet Fever . . .	31	4	2	1	1	...	...	...	...	...	...	...	39
Thrush . . .	2	...	...	...	...	...	...	...	...	...	...	...	2
Consumption . . .	3	2	1	1	5	...	2	3	...	...	...	...	17
Worm Fever . . .	2	4	...	...	...	...	...	...	...	...	...	...	6
NERVOUS DISEASES—													
Palsy . . .	...	...	...	...	...	...	...	1	...	...	...	...	2
Swoon, or Fainting . . .	...	...	...	...	...	...	1	...	...	1	...	...	2
Indigestion . . .	...	...	...	...	...	...	...	...	...	...	...	...	1
Convulsions . . .	2	...	...	...	...	...	...	...	...	...	...	...	2
Epilepsy . . .	...	...	...	...	1	...	...	...	...	...	...	...	1
Asthma . . .	...	...	...	...	...	...	...	1	2	...	...	...	3
Looseness . . .	3	...	...	...	...	...	...	...	...	1	...	...	4
Insanity . . .	...	...	...	...	...	1	...	...	...	...	...	...	1
DISEASES OF THE HABIT—													
Weakness of Infancy . . .	9	...	...	...	...	...	...	...	...	...	...	...	9
Decay of Age . . .	...	...	...	...	...	...	...	4	6	11	2	...	23
Dropsy . . .	...	...	...	...	...	...	1	...	2	...	...	...	3
Dropsy of the head . . .	...	...	1	...	...	...	...	...	...	...	...	...	1
Dropsy of the belly . . .	...	1	...	...	...	1	...	...	...	...	...	...	2
King's Evil . . .	...	1	...	...	...	...	...	...	...	...	...	...	1
LOCAL DISEASES—													
Discharge of blood . . .	...	...	...	...	...	...	1	...	...	...	...	...	1
Costiveness . . .	1	...	...	...	...	...	...	...	...	...	...	...	1
Tumour of the stomach . . .	...	...	...	...	...	...	...	1	...	...	...	...	1
Ulcer . . .	...	...	...	...	...	...	1	...	...	...	...	...	2
Difficult delivery . . .	...	...	...	...	1	1	...	...	...	...	...	...	2
Unknown diseases . . .	6	...	1	...	2	2	2	7	3	1	...	...	24
Accidents . . .	1	...	1	...	2	...	...	...	...	...	...	...	4
TOTAL . . .	150	14	7	4	12	6	9	10	18	14	12	2	258

He classified the diseases under Cullen's *Genera Morborum*.

1 in $20\frac{3}{4}$; in Edinburgh, 1 in $20\frac{1}{5}$; in Leeds, 1 in $21\frac{3}{8}$; in Dublin, 1 in 22; in Rome, 1 in 23; in Amsterdam, 1 in 24; in Breslau, 1 in 25; in Berlin, 1 in $26\frac{1}{2}$; in Northampton and Shrewsbury, 1 in $26\frac{1}{2}$; in Liverpool, 1 in $27\frac{1}{2}$; in Manchester, 1 in 28; in Chester, 1 in 40; but in the year 1774, when the smallpox was very general and fatal, 1 in 27; whilst in Carlisle the mortality was in 1779, 1 in $30\frac{3}{8}$."

Heysham looked upon Tables Nos. III. and IV. as "of the utmost importance to the physician, the politician, and the calculator of annuities; and to every one who has the health and happiness of himself and family at heart. They clearly demonstrate, as far as one year's observation can have weight, what periods of life are the most healthy, what are the most obnoxious to disease.

His tables show that women live longer than men. During 1779, twelve persons died between 80 and 90 years old, eight of these were females; and the two persons who lived between 90 and 100 years were both females. There were four widows to one widower, an astonishing disproportion, which he endeavoured to account for on the following grounds:—1st, Men are in general more intemperate than women; 2d, They are exposed to greater hardships and dangers; 3d, Widowers perhaps in general have greater opportunities of getting wives, than widows have of getting husbands; 4th, Widows have a greater propensity to live in towns than widowers; 5th, Women in general, and more especially

among the middle ranks of life, marry earlier than men; 6th, That as men have "firmer and more robust" constitutions than women, their "muscular and nervous fibres" sooner become stiff and rigid, and less able to meet the "functions necessary to health and life." "But from whatever causes the difference of longevity betwixt males and females may arise, the fact itself is sufficiently ascertained by Table III., where we find that between the ages of 60 and 70, although there are a greater number of wives than husbands, yet eleven husbands and only four wives have died; and of all different ages, 29 husbands and 16 wives."

The mortality from smallpox is worth noting. In the last six months of 1779, 300 persons were seized with smallpox in the natural way, and of these, 90, or nearly 1 in 3, died! During the same period several hundreds were inoculated in the neighbourhood of Carlisle, and not one of them died—assuredly a pleasing truth, which led Heysham to say, that had the 300 been inoculated, instead of 90 succumbing to the disease, not above 6 persons would have died; and 84 persons might have been saved to their parents and the public. Heysham justly complained of the prejudice against the salutary practice of inoculation amongst the vulgar, and that few, very few, could be prevailed upon, either by promises, rewards, or entreaties, to submit to the operation. "No wonder, that in rude, ignorant, and barbarous times, superstition hurried men into the grossest absurdities; when in a polished and

enlightened age, in an age too, when the experience of full twenty years* had clearly demonstrated the utility of inoculation, we see the bulk of mankind ready to sacrifice their children, and all that is dear to them, to a foolish prejudice."

The following Table V. shows the total of deaths in each season:—

TABLE V.

Deaths in	Males.	Females.	Total.	Total of Deaths in each Season.
January	4	7	11	} 33 Winter.
February	6	4	10	
March	6	6	12	
April	6	3	9	} 34 Spring.
May	7	10	17	
June	5	3	8	
July	7	7	14	} 75 Summer.
August	14	5	19	
September	20	22	42	
October	30	23	53	} 116 Autumn.
November	18	20	38	
December	10	15	25	
Total	133	125	258	
	Males.	Females.	Total.	<i>N.B.</i> —The christenings are by no means accurate, many of the Dissenters not being registered.
Christenings.	102	109	211	

* Lady Mary Wortley Montagu introduced "the engrafting of the small-pox" into England in 1722. It met with virulent opposition at the hands of both doctors and clergy. The Rev. Edward Messey preached a sermon against it, and asserted that "Job's distemper was confluent smallpox, and that he had

These five tables were compiled by Dr. Heysham to illustrate the bills of mortality for 1779. He adopted the same forms in subsequent years, up to the end of December 1787; it is not necessary to repeat each year, as the general results of his nine years' observations are recorded in another page.

Dr. Heysham's placing the months of February and March as winter months is not so inconsistent as it appears. March is the most trying month of the year, with cold, north-east winds, and frost.

FOR THE YEAR 1780.—A feeling had got abroad, especially among the political economists, that the population and resources of Great Britain were depreciating very fast, and that we would become an easy prey to our enemies, particularly the French. The data from which these untoward inferences had been drawn were the returns of the window-surveyors, and the books of the custom and excise.* Heysham had the opportunity of showing

been inoculated by the devil!" The Smallpox Hospital in London was founded in 1746. The College of Physicians gave their unanimous sanction to the practice of inoculation in 1754; prior to this date, however, Lady Montagu's noble example had been largely followed among the upper ranks.

* The Government, rightly or wrongly, believed in the depopulation of the country, but, instead of trying to remedy such a state of things by sanitary legislation, continued their odious window-tax to make matters worse. In a future page of this volume it will be seen how dreadfully this tax operated on the citizens of Carlisle in 1781 and subsequently. In the history of legislation

the fallacy of these calculations as far as Carlisle was concerned, and thereby helped to cast a doubt on the general data furnished from the country at large by Government officials.

"In the beginning of the year 1780," writes Heysham, "I made an actual, and, I believe, an accurate survey of the two parishes, St. Mary's and St. Cuthbert's,* and found they contained 1148 houses, 1872 families, and 7677 inhabitants." A few months afterwards another survey was made by surveyors for the window-tax, who only returned 815 houses, the difference therefore between the *real* number of houses and the number *returned* to the window-tax was 333. Heysham supposed that if, in ignorance of the real facts, he had taken the 815 houses of the surveyor's report, and multiplied this number by six and two-thirds,† which he looked upon as nearly the number of people in

no more absurd enactment could be found than imposing a tax on the air and light of heaven.

* In this survey the outlying townships are included with the city and suburbs. *Vide* Table I.

† As a rule, Heysham gave six persons to a family household. The assigning four children to each parentage will appear to many readers a somewhat high proportion. On considering the prolificacy of the district, there is no reason, however, for doubting his opinions on this head. The native Cumbrians did well; and, with their early connubialities, the Irish and Scotch were not far behind in the race, so that all parties contributed their quota to the Carlisle census. The large number of children, so many of whom die in infancy, or under five years of age, greatly tended to increase the tables of mortality. This fact will be noted in another place.

each house, the product would have been 5433 nearly, or 2244 less than the real number, or two-sevenths of the whole.

Only 1 in $34\frac{1}{2}$ nearly of all the inhabitants of Carlisle died this year (1780) in consequence of diseases.

Last year's Bills were confirmed as to women living longer than men, "for between 100 and 103 years old two persons died who were both females; 26 husbands and only 15 wives died, although there are a greater number of wives than husbands in Carlisle." The greatest number of consumptive cases died between 20 and 30 years of age than during any other period of ten years.

FOR THE YEAR 1781.—"People of all ranks, ages, and conditions of life enjoyed an uncommon degree of health during the first three months of this year, for within that period no more than 23 persons died, and of these 15 were either very young children or old and infirm. But about the beginning of April, a very epidemic fever, evidently the *Typhus carcerum*, began to make its appearance."* The smallpox were constantly in town all this year, but 19 only died. Great numbers were inoculated both in the town and country villages.

The difference of the number of deaths of husbands and wives was not near so great as in 1799 and 1780, yet still the deaths

* This jail-fever, as described by Dr. Heysham, will be treated in a separate chapter.

of the former exceed those of the latter by two; for 33 husbands and only 31 wives have died.

Between 80 and 90 years of age, 5 males and 4 females; and between 90 and 100, three females died.

During this year 1 in $38\frac{2}{3}$ of the inhabitants died of disease.

FOR THE YEAR 1782.—The *Typhus carcerum*, or jail-fever, which raged with so much violence last year, gradually declined, and was scarcely to be met with after May. Sixteen persons died of it. Thirty people died of smallpox. In June of this year the *Catarrhus contagiosus*, or *Influenza*, became so general in Carlisle that very few families escaped its influence; but only one death occurred. Heysham entered into the history of the epidemic, and of its frequent occurrence in Europe in the eighteenth century. It seems to have been a very mild disease in Carlisle, differing little from the common catarrh or cold, except that the febrile symptoms were more constant and rather more severe.

The mortality of 1782 was only a fraction less than 1781—namely 1 in 38. For the first time, the number of deaths of wives exceeded those of husbands—22 wives against 20 husbands. The longevity of the people is again marked. Between 80 and 90 years of age, 5 males and 9 females, and between 90 and 100, 1 male and 2 females, died. A widow died in her 102d year.

FOR THE YEAR 1783.—The weather during summer and autumn was “extremely hot and sultry, and there was more thunder and lightning than ever was remembered, even by the oldest person.” The prevalence of smallpox led to a general inoculation. By this salutary measure, Carlisle was, in the space of two months, totally freed from a most fatal disorder, then raging in different parts of the county, and destroying 1 in 3 attacked at Whitehaven. The health of Carlisle was otherwise good, and only 1 in 43 of the inhabitants died.

Twenty-nine husbands and 23 wives died this year. Between 80 and 90 years of age, 4 males and 7 females, 6 of whom were widows; and between 90 and 100, 1 male and 1 female died.

Nineteen only fell victims to the smallpox, and 17 of these were children under five years of age.

Apoplexies were remarkably frequent this year, and no less than 9 persons died from them. The numbers of deaths from all diseases were remarkably equal during all the seasons; 47 died in winter, 42 in spring, 45 in summer, and 47 in autumn.

FOR THE YEAR 1784.—In reporting the extreme salubrity of this year, and that only 154 persons died, he calls attention to the fact that in 1779 the number swept off by two diseases only—namely, the smallpox and scarlet fever—was nearly equal to the whole number of deaths in the year, whether occasioned by diseases or accidents.

The present year commenced and ended with the severest and longest-continued frosts ever remembered since the year 1740. The summer, too, was uncommonly cold and wet, and yet was the healthiest season; only 1 in 50 $\frac{1}{2}$, nearly, died. In the midst of this healthiness an obstinate skin-disease, Herpes, prevailed, and taxed the skill of the physician and the patience of the lieges affected.

Twenty-nine husbands, but only 20 wives, died this year; 4 widowers and 24 widows.

Between 80 and 90 years of age, 4 males and 9 females, 8 of whom were widows; and between 90 and 100, 1 male and 3 females died.

Hitherto the number of males born has exceeded the number of females; but this year it is the reverse, for 121 males and 153 females have been christened.

FOR THE YEAR 1785.—This year was ushered in by frost of long continuance, and the drought of the spring, and far on to summer, was beyond anything ever remembered. There was no rain—a very few slight showers excepted—from the month of October 1784 till the 29th July 1785. Jail-fever, originating among the felons confined in the jail, spread over the town, and 97 persons were affected by it. The fever was in a milder form than four years previously, and was occasionally attended with relapses. Only 4 out of the 97 died, and two of these

were not seen till remedies were unavailable. As these people lived in nasty lanes, and were huddled together, the small mortality is astonishing; and the curiosity of the medical reader is excited to know the "reason why," and this the next paragraph in the report explains—"The Dispensary expended upwards of £30 for wine, all of which was consumed by persons affected with the fever."

The Dispensary Committee, of which Dr. Heysham was the ruling mind, had again to adopt strict measures with reference to the smallpox. About 200 persons were inoculated, every one of whom not only recovered, but had the disease in a very favourable manner. Fifty lives, Heysham conjectured, were saved by this general inoculation. 39 died of smallpox this year, who were all under 5 years of age.

As usual, the husbands fared worse than wives. 29 husbands and only 25 wives, 9 widowers and 21 widows, died during the year. The mortality of all the inhabitants was 1 in 37 $\frac{1}{2}$ nearly.

Heysham noted an interesting fact as to age affecting mortality—that in 1450 persons from 10 to 20 years old only 2 died. This comparative immunity from death in young folk (that is, after the infantile period) has been frequently witnessed since Heysham's day. The longevity of the Carlisle folk is strikingly seen this year, 14 persons dying between 80 and 90 years of age, and 6 between 90 and 100 years of age. The births were 148 males and 119 females.

FOR THE YEAR 1786.—This year showed the same mortality as 1785; and the hottest months were the healthiest. At two o'clock on the morning of August 11, the shock of an earthquake was felt by many persons in Carlisle and the neighbourhood. The concussion seemed to have extended across the island from Newcastle to Whitehaven, and from the south to the north, including Glasgow and the northern parts of Lancashire.

Measles, in a mild form, was very common, but of the 600 or 700 attacked, only 28 died, the greater part of whom were the children of the poorest class; 26 were under 5 years of age; 2 were between 5 and 10 years old. An old soldier, who had been subject to many vicissitudes of life, died at the advanced age of 105 years. 24 husbands and only 21 wives died this year. The widows again figure largely in the deaths between 80 and 100 years.

FOR THE YEAR 1787.—An order was issued from the Court of Quarter Sessions this year to the different constables in the county of Cumberland to make an actual survey of all the inhabitants of the county. Dr. Heysham showed the lists delivered to the Quarter Sessions to be erroneous as far as Carlisle was concerned. The survey of the city was made in the latter end of December 1787, so that it may be presumed that his corrections were made early in 1788. He found the population of the city, suburbs, and outlying townships of St. Mary's and

St. Cuthbert's to be 3864 males, 4813 females; or 8677 inhabitants—showing an increase in the population in the space of eight years of exactly 1000 persons.—*Vide* Table VI.

TABLE VI.

	Survey of the two Parishes of Carlisle made by the Constables in December 1787.			The Survey corrected by Dr. Heysham.		
	Males.	Females.	Total.	Males.	Females.	Total.
English Street Quarter	730	1020	1750	801	1050	1851
Scotch Street	423	512	935	423	530	953
Fisher Street	143	222	365	143	222	365
Castle Street	289	368	657	320	411	731
Abbey Street	319	474	793	340	521	861
The Abbey	...	...	...	20	24	44
Botchergate	259	329	588	259	329	588
Rickergate	319	367	686	319	367	686
Caldewgate	576	705	1281	576	705	1281
Harraby	26	26	52	26	26	52
Carleton	91	81	172	91	81	172
Wreay	...	...	...	60	54	114
Brisco	88	82	170	95	89	184
Botcherby	43	46	89	43	46	89
Upperby	44	48	92	44	48	92
Blackhall	169	151	320	169	151	320
Cummersdale	105	123	228	105	123	228
Persons omitted in various parts of the Town . . . }	...	...	...	30	36	66
Total . . .	3624	4554	8178	3864	4813	8677

TABLE VII.

Of the NUMBER of INHABITANTS of Different Ages.

	Under 5 years.	Between 5 and 10 years.	Between 10 and 15 years.	Between 15 and 20 years.	Between 20 and 30 years.	Between 30 and 40 years.	Between 40 and 50 years.	Between 50 and 60 years.	Between 60 and 70 years.	Between 70 and 80 years.	Between 80 and 90 years.	Between 90 and 100 years.	Between 100 and 105 years.	TOTAL.
Within the City and Suburbs }	859	731	587	543	1030	733	729	498	375	164	44	5	1	6299
In the Villages .	170	177	128	132	298	144	129	90	63	27	14	5	1	1378
Total in 1780 .	1029	908	715	675	1328	877	858	588	438	191	58	10	2	7677
Total in 1788* .	1164	1026	808	763	1501	991	970	665	494	216	66	11	2	8677
Increase . . .	135	118	93	88	173	114	112	77	56	25	8	1	...	1000

He attributed this rapid increase to two general causes: *the salubrity of the place, and the increase of trade and manufactures.* The former statement he proved by the births exceeding the deaths to the extent of 489; and the latter by an ingress of inhabitants into Carlisle exceeding the emigration out of it during the same period, 511; which numbers together make up the increase of 1000.

Inoculation, Heysham was persuaded, had greatly contributed

* The Census of 1780 was taken in January; the Census marked above as 1788 was taken in December 1787 by the Constables, and corrected by Heysham early in 1788. It simplifies matters to look upon the respective enumerations of the inhabitants of Carlisle as being made in January 1780 and January 1788, and corresponds with Dr. Heysham's own declaration in the text of "the space of eight years" marked by an increase of exactly 1000 persons in the population of Carlisle.

to the increase of population, not only in Carlisle, but in the whole county of Cumberland. In the year 1779, when the lower class of inhabitants were extremely averse to the salutary discovery, no fewer than 90 persons died of the natural smallpox; whereas, when the prejudices of the vulgar greatly diminished, and inoculation got a better chance, only 151 died during the eight succeeding years—an average of not quite 19 in each year. After the institution of the Dispensary, the poor enjoyed the privilege of having their children inoculated gratis—an advantage which they readily embraced.

The mildness of the winter and early spring was remarkable. The *common daisy* was in flower on New Year's Day, and continued in blossom almost the whole year. The *primrose* began to blow on the first of February, and the *colt's-foot* and *barren strawberry* very early in the same month. As the season advanced, the weather was cold, gloomy, and wet, and the rainfall was something extraordinary, yet the year was a healthy one, and the last six months remarkably so. *Seventy-three persons only* died during that period.

With the appearance of smallpox, inoculation became general, and with good effect. Of eighty-four persons inoculated at the Dispensary, all not only survived, but had the disease very favourably.

The jail-fever prevailed this year, and 14 persons fell victims to it. 34 husbands and only 22 wives died. The mortality for the year was 1 in 44 nearly.

TABLE VIII.—DR. HEYSHAM'S TABLE OF THE DISEASES WHICH CAUSED ALL THE DEATHS IN CARLISLE during the Eight Years, 1779, 1781, 1782, 1783, 1784, 1785, 1786, and 1787.*

DISEASES	Under 5 years.	Between 5 and 10 years.	Between 10 and 15 years.	Between 15 and 20 years.	Between 20 and 30 years.	Between 30 and 40 years.	Between 40 and 50 years.	Between 50 and 60 years.	Between 60 and 70 years.	Between 70 and 80 years.	Between 80 and 90 years.	Aged 90 and upwards.	Of all Ages.	Proportion of 10,000 deaths.
	1. FEBRILE DISEASES—													
Inflammatory Fever	3	3	1	4	1	9	15	1	7	2	2	...	5	31
Nervous "	2	4	1	2	3	8	13	1	5	1	1	...	59	365
Putrid "	5	4	1	2	8	5	4	...	...	...	...	...	43	266
Jail Mortification	4	2	1	2	...	2	3	...	...	...	...	...	14	87
Sore Throat . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	3	19
Pleurisy	3	2	1	1	...	...	...	...	...	...	...	...	3	19
Stone and Gravel	3	1	1	1	1	1	2	5	6	1	...	...	19	118
Rheumatism . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	9	56
Gout . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	6	37
Smallpox . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	4	25
Menses	225	8	2	...	...	...	...	...	...	...	...	...	238	1,474
Scarlet Fever	28	2	1	...	...	...	...	...	...	...	...	...	31	192
Thrush	31	4	2	1	1	...	...	...	...	...	...	...	39	241
Consumption	63	2	...	...	...	...	...	...	...	...	...	...	65	402
Worm Fever	34	15	10	15	45	34	31	15	15	...	...	...	214	1,325
Flooding	19	8	...	...	...	...	...	...	...	...	...	...	27	167
Teething . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	3	19
5 other Diseases (A)	3	...	...	...	...	...	...	...	...	...	...	...	3	19
...	...	...	...	...	...	...	...	...	...	...	...	...	5	31
2. NERVOUS DISEASES—														
Apoplexy . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	32	198
Palsy . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	14	87
Fainting . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	6	37
Indigestion . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	21	130
Convulsions	10	...	...	...	...	...	...	...	...	...	...	...	10	62
Epilepsy . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	4	25
Asthma	1	...	...	...	...	...	...	...	...	...	...	...	27	167
Chincough	18	1	...	...	...	...	...	...	...	...	...	...	19	118
Looseness	7	1	1	1	1	1	2	2	1	2	...	...	18	111
4 other Diseases (B) . . . . .	...	...	...	...	...	...	...	...	...	...	...	...	5	31

DISEASES	1779	1780	1781	1782	1783	1784	1785	1786	1787	GRAND TOTAL				
	3. DISEASES OF THE HABIT—													
Weakness of Infancy	204	...	...	...	...	...	...	...	...	204
Decay of Age	1	1	1	1	1	1	1	1	1	1,263				
Dropsy	2	2	2	2	2	2	2	2	2	1,399				
Dropsy of the Brain . . . . .	...	...	...	...	...	...	...	...	...	303
King's Evil . . . . .	...	...	...	...	...	...	...	...	...	31
Veneral Disease . . . . .	...	...	...	...	...	...	...	...	...	19
Jaundice	3	...	...	...	...	...	...	...	...	12
4. LOCAL DISEASES—														
Cancer . . . . .	...	...	...	...	...	...	...	...	...	5
Difficult Delivery . . . . .	...	...	...	...	...	...	...	...	...	9
Unknown Diseases	32	11	5	...	...	...	...	...	...	56
8 other Diseases (C)	1	...	...	...	...	...	...	...	...	712
Accidents	7	5	2	4	3	4	4	2	1	56				
GRAND TOTAL	709	74	30	38	79	81	108	94	152	134	89	27	1615	10,000

PROPORTION OF DEATHS TO POPULATION IN CARLISLE.

Year	Population	Deaths	Proportion
1779	1812	1	1 in 308
1780	13,495	1	1 in 34½
1781	13,495	1	1 in 38½
1782	13,495	1	1 in 38
1783	13,495	1	1 in 43½
1784	13,495	1	1 in 50½
1785	13,495	1	1 in 37½
1786	13,495	1	1 in 37½
1787	13,495	1	1 in 44
9)	354	39½	

With the view of comparison, Dr. Heysham instanced the year 1812.

Year	Population	Deaths	Proportion
1812	13,495	1	1 in 40½
Soldiers—55th and 2d Dragoon Guards, exclusive of Wives and Children—			
	338	13,795	(40)
Deaths	1,352	275	

* The Memorandums for 1780 were either lost or not deemed sufficiently correct to be included with the above years.

SUPPLEMENT TO DR. HEYSHAM'S TABLE, containing the DISEASES whereof only One or Two died.

	Under 5 years.	Between 5 and 10 years.	Between 10 and 15 years.	Between 15 and 20 years.	Between 20 and 30 years.	Between 30 and 40 years.	Between 40 and 50 years.	Between 50 and 60 years.	Between 60 and 70 years.	Between 70 and 80 years.	Between 80 and 90 years.	Aged 90 and upwards.	Of all Ages.	Proportion of 10,000 deaths.
I. FEBRILE DISEASES—														
Ague	1	...	...	...	...	1	6.2
Inflammation of Stomach	1	...	...	...	...	...	...	...	...	1	6.2
Abscess of the Liver	1	...	...	...	...	...	1	6.2
Miliary Fever	1	...	...	...	...	...	...	...	1	6.2
Influenza	1	...	...	...	1	6.2
(A) of these 5 Diseases	1	1	...	1	1	1	...	...	...	5	31.
2. NERVOUS DISEASES—														
Green Sickness	1	...	...	...	...	...	...	...	...	1	6.2
Colic	1	...	...	...	...	...	...	...	1	6.2
Diabetes	1	...	...	...	...	...	...	1	6.2
Insanity	1	...	...	1	...	...	...	2	12.4
(B) of these 4 Diseases	1	1	2	...	...	1	...	...	...	5	31.
3. DISEASES OF THE HABIT—														
A discharge of Blood	1	...	...	...	...	...	1	6.2
Costiveness	1	...	...	...	...	...	...	...	...	...	...	...	1	6.2
Suppression of Urine	1	...	...	...	1	6.2
Obstruction of the Menses	1	...	...	...	...	...	...	1	6.2
Tumour of the Stomach	Doubtful	...	...	...	...	...	1	...	...	...	...	...	1	6.2
Rupture	1	...	...	...	...	...	...	...	...	1	6.2
Ulcer	1	...	1	...	...	...	2	12.4
Ulcer of the Bladder	1	...	...	...	1	6.2
(C) of these 8 Diseases	1	...	...	1	...	1	2	1	3	...	...	...	9	56.

TYPHUS.

1779 - - - - -	5	1785 - - - - -	9
1780 - - - - -	3	1786 - - - - -	10
1781 - - - - -	48	1787 - - - - -	14
1782 - - - - -	16		
1783 - - - - -	6		9) 119
1784 - - - - -	8		Per Annum 13

TABLE OF DEATHS from SMALLPOX in Carlisle, from a paper enclosed in a letter to Mr. Joshua Milne, Nov. 1, 1812.

1779 - - - - -	90	1785 - - - - -	39
1780 - - - - -	3	1786 - - - - -	1
1781 - - - - -	19	1787 - - - - -	30
1782 - - - - -	30		
1783 - - - - -	19		9) 241
1784 - - - - -	10		26.7

Dr. Heysham summed up the average of the nine years from 1779 to 1787 inclusive, and found that 1 in 39½ of the inhabitants of Carlisle died annually. "It must be remarked, in the first place, that every infectious and epidemic disease, to which the human body is subject (the plague excepted), prevailed during this period at Carlisle; and in the second place, that the calculations were made for the first eight years from the number of inhabitants which existed in the beginning of the year 1780; the great increase of 1000 not being ascertained till December 1787. Therefore, although the deaths from accidents were not taken into the account for several of the first years, yet, upon the whole, the mortality is stated to be greater than it actually is."—See Table IX.

TABLE IX.

Of the PROPORTION of the DEATHS to the LIVING under Different Ages. From January 1779 to the end of the Year 1787.

Under	5 years	...	Average of Nine Years.
		...	1 in 12 and 9-11ths nearly.
5 ... 10	"	...	1 in 115 and 2-9ths "
10 ... 15	"	...	1 in 284 and 1-7th "
15 ... 20	"	...	1 in 119 and 3-10ths "
20 ... 30	"	...	1 in 145 and 9-10ths "
30 ... 40	"	...	1 in 100 and 3-5ths "
40 ... 50	"	...	1 in 73 and 5-6ths "
50 ... 60	"	...	1 in 57 nearly.
60 ... 70	"	...	1 in 23 and 9-10ths "
70 ... 80	"	...	1 in 10 and 7-8ths "
80 ... 90	"	...	1 in 5 and 11-14ths "
90 ... 100	"	...	1 in 3 and 13-18ths "

Of all the inhabitants in 1779, 1 in $30\frac{3}{4}$ died annually; in 1780, 1 in $34\frac{1}{2}$; in 1781, 1 in $38\frac{3}{8}$; in 1782, 1 in 38; in 1783, 1 in $43\frac{1}{7}$; in 1784, 1 in $50\frac{1}{8}$; in 1785, 1 in $37\frac{1}{7}$; in 1786, 1 in $37\frac{5}{8}$; in 1787, 1 in 44. The average of the nine years being 1 in $39\frac{1}{4}$ nearly.

N.B.—This Table makes the mortality greater than it actually is, as the calculations from 1779 to 1787 inclusive were made from the number of inhabitants which existed in January 1780; whereas there was an increase of 1000 in that period.

“The deaths which occurred from accidents were, in 1779, 4; in 1780, 3; in 1781, 5; in 1782, 4; in 1783, 3; in 1784, 5; in 1785, 4; in 1786, 2; and in 1787, 2.”

From Table IX. it appears that the most healthy period of human life is from 10 to 15 years of age; and that health declines in the following order—namely, between 20 and 30, 15 and 20, 5 and 10, 30 and 40, 40 and 50, 50 and 60, 60 and 70, under 5, 70 and 80, 80 and 90, 90 and 100.

In the month of April 1796 a survey was made of Carlisle by Mr. Johnston, under the direction of the editors of Hutchinson's *History of Cumberland*; and the two parishes of St. Mary and St. Cuthbert were found to contain 1587 houses, 2616 families, and 10,289 inhabitants. It therefore appears that the increase in the population of Carlisle from 1780 to 1796 was 2612, and from 1788 to 1796 of 1612 persons.

CHAPTER IV.

HISTORY OF THE JAIL-FEVER IN CARLISLE—THE FOUNDATION OF THE
CARLISLE DISPENSARY—MEDICAL CASES—HUMAN MONSTROSITY.

[N the beginning of April 1781, there was an outbreak of typhus fever in Carlisle, resembling in character the jail-fever or *Typhus carcerum* of authors. This fever made its appearance in Ricker-gate, a suburban district on the north side, in a house which contained about half-a-dozen very poor families; the rooms were exceedingly small, and in order to diminish the window-tax, every window that even poverty could dispense with, was shut up: hence stagnation of air, which was rendered still more noxious by the filth and uncleanness of the people. “One of the persons affected with fever in this house was a weaver, who, on his recovery, went to his usual employment at a large workshop, where he communicated the disease to his fellow-weavers, and from thence the fever spread all over the town.” The disease prevailed “amongst the common and lower ranks of people, and more especially those who lived in narrow, close, confined lanes, and in small crowded apartments. It continued for twelve months, and affected adults more frequently than children; the infirm