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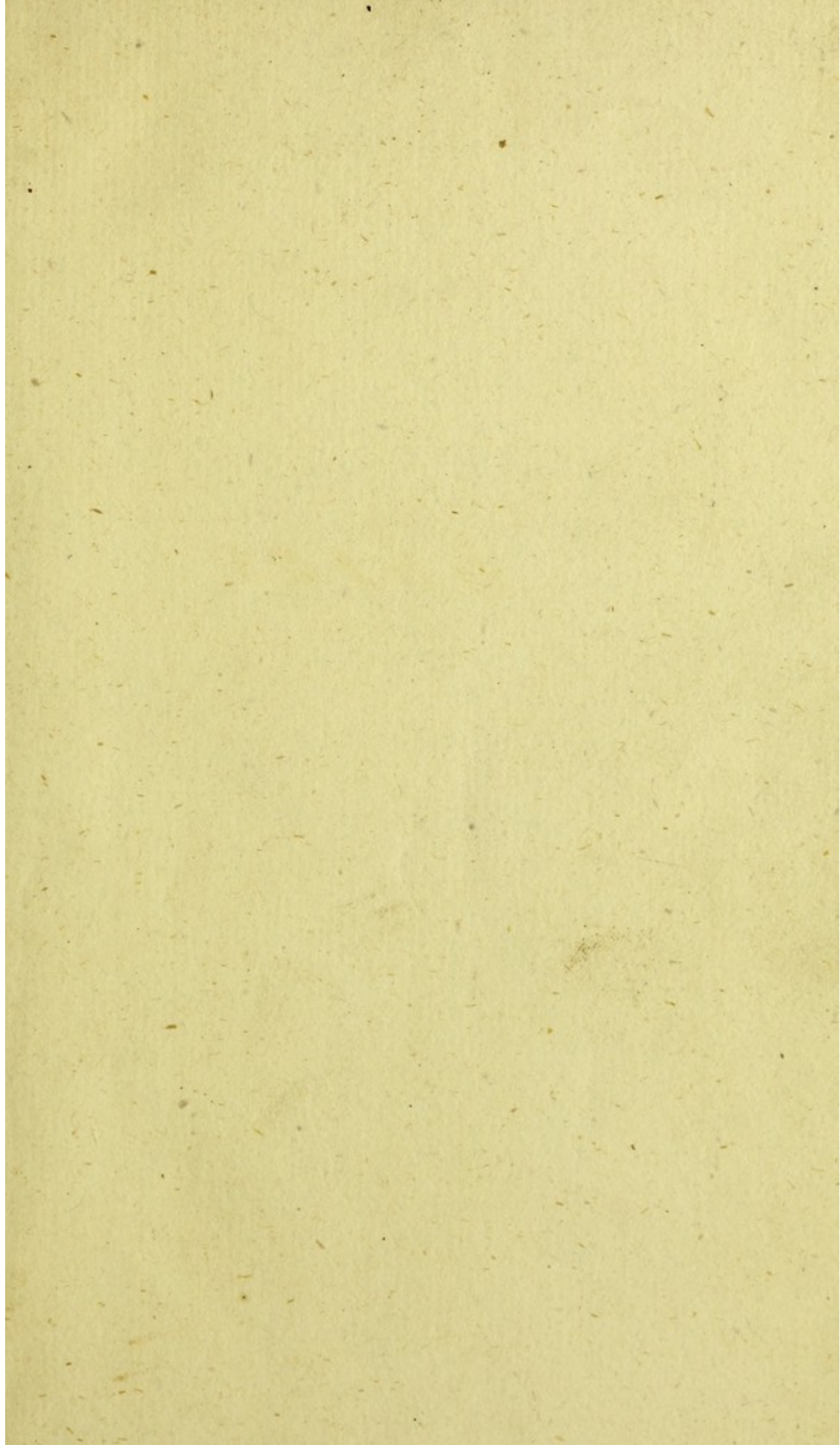
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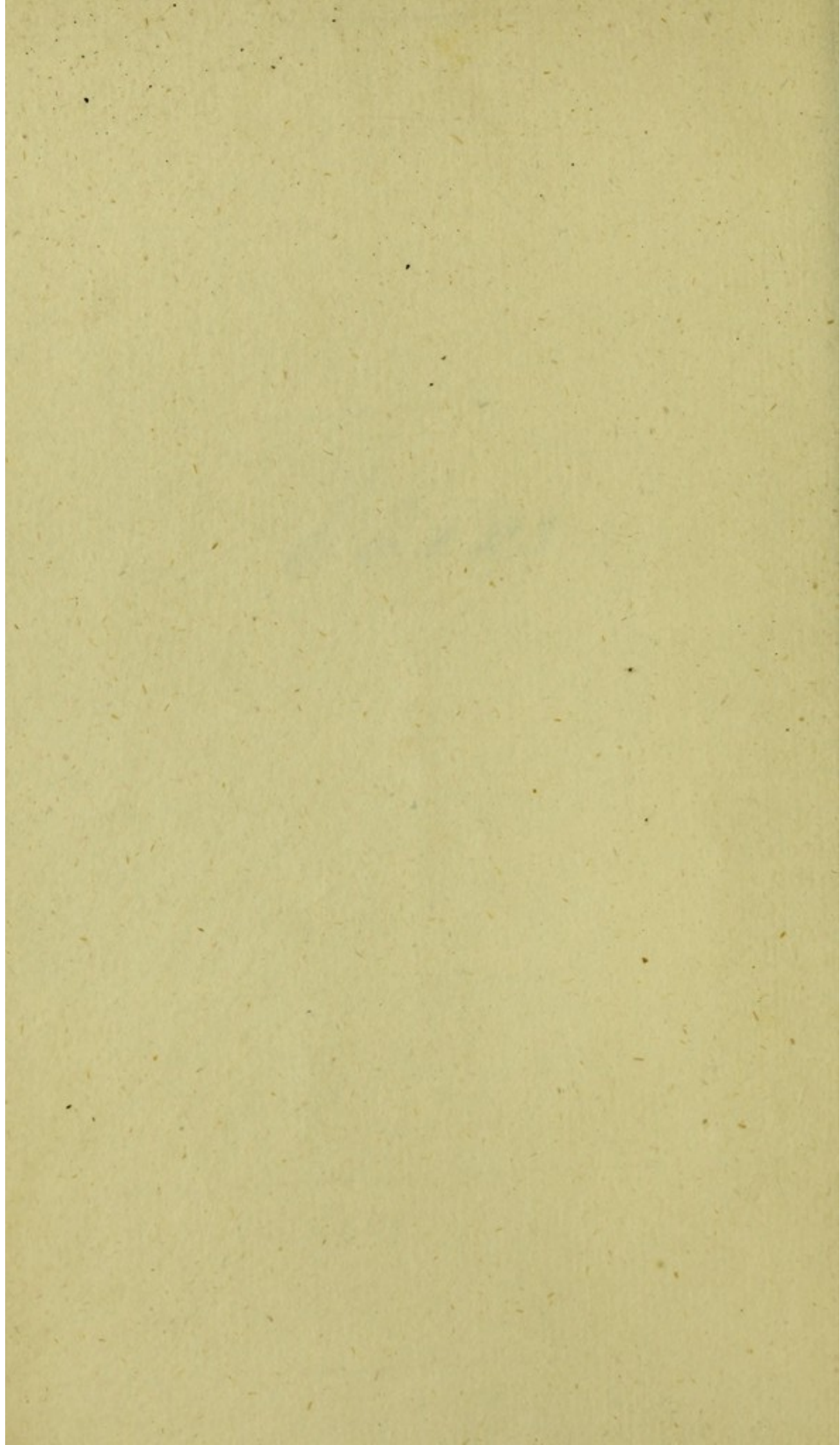
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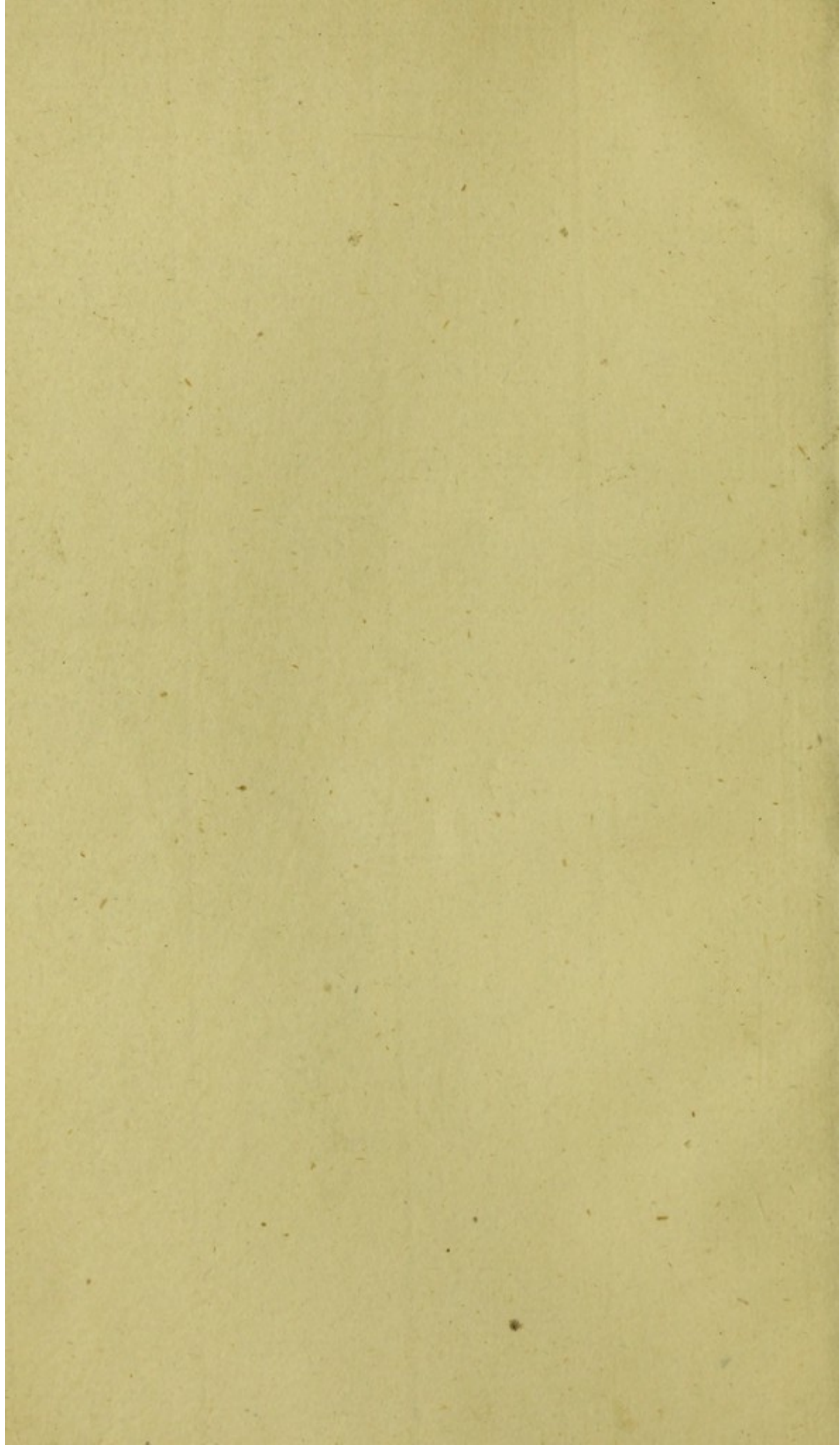






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REMARKS
ON THE
FREQUENCY AND FATALITY
OF
DIFFERENT DISEASES,
&c.

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INCREASE OF CONSUMPTION:
WITH
OBSERVATIONS
ON THE
INFLUENCE OF THE SEASONS
ON
MORTALITY.

BY WILLIAM WOOLLCOMBE, M. D.

LONDON:

PRINTED FOR LONGMAN, HURST, REES, AND ORME,
PATERNOSTER ROW;

AND REES AND CURTIS, PLYMOUTH.

1808.

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PREFACE.

IN submitting to the Public the result of his own inquiries concerning some points of Statistical Medicine, the design of the Author will be accomplished, if it shall be found that some useful addition has been made to the stock of authentic materials, some useful suggestions offered, conducive to the more successful investigation of subjects, which he deems of importance, of questions in which he thinks the interest of the Public intimately concerned.

Of the Tables, which constitute the essential part of the following pages, the first five have been formed from materials afforded by the register of the medical cases occurring at the Public Dispensary at Plymouth, in a period of seven years from the establishment of the Institution. In framing them the object has been, to exhibit the proportionate prevalence of different diseases, and the absolute and relative mortality resulting from them; as well as to afford grounds for instituting a comparison between the prevalence of diseases in different districts at the same period, and in the same district at different periods.

The space of time which they include, may perhaps be deemed too limited, to admit of the deduction of general conclusions with much confidence in their validity; yet their coincidence, in many in-

stances, with observations derived from more extended experience, may afford a presumption of their not being altogether unworthy of attention. Many deficiencies in their construction, which cannot be referred to this source of imperfection, will readily be noticed. To account for these in a general way it may be sufficient to observe, that the register of the cases was not made with any reference to the use to which it has been now applied. Its primary object was merely to keep in the view of the Physician the number and character of the cases immediately under his care; and to furnish the means of annually informing the Subscribers to the Institution of the extent to which their charity had been applied, and of the degree of benefit resulting from it. This will account for the deficiency observable at the end of the first Table, where the total number is made up by the addition of a

considerable portion of cases, to which no distinctive appellations of disease have been assigned.

It will not be denied, that the inferences of the relation of diseases to each other, and the proportion of any one distemper to the whole number, must be affected by this omission; yet the conclusions relating to the diseases of most importance, either as to their prevalence or their consequences, are comparatively little influenced by it; since the omission of assigning names must generally have occurred in slight and unimportant disorders, with the exception of a few cases, where it may purposely have arisen from the obscurity in which the nature of the distemper was involved. Many of the cases unnamed may, with certainty, be referred to the class of eruptive diseases, and are so marked in the register; the omission, in this instance,

arising from the uncertainty prevailing at the moment, as to the proper head to which they should be referred, according to the arrangement of Dr. Willan, whose nomenclature has been otherwise adhered to.

A strict adherence to nosological accuracy has not been aimed at. In general the names of diseases adopted are those assigned by Dr. Cullen; in some instances they correspond with those employed by Sauvages. Where any term is used in a different or unusual sense, it is signified in a note subjoined. The inattention and irregularity in attendance of patients at Dispensaries, render precision in ascertaining their complaints often impracticable.

The valuable work of Dr. Heberden, on the increase and decrease of diseases, having in great measure suggested the

formation of these Tables, a comparison of the inferences deducible from them with his observations, naturally became a primary object. And if the following pages be found to contain any confirmation of the conclusions of that Author, they may derive from this circumstance a collateral claim to that attention, of which independently they might not be deemed deserving.

Several facts, and many grounds of comparison, have also been derived from Dr. Willan's Reports on the Diseases in London; a work abounding in useful and accurate information, and enriched with the practical observations of a discriminating and enlightened mind.

On two subjects the inquiry has been carried far beyond the limits of mere comparison. The desire of ascertaining with

more precision, than seems hitherto to have been attained, the extent of the prevalence of consumption, occasioned in the investigation of that point a minuteness, which will be excused by those who are impressed with the importance of the question. The inquiry into the influence of the seasons on disease and mortality, was also deemed sufficiently interesting to justify a more detailed examination of the evidence on which it rests. If the popular opinion on this point be erroneous, the error is not merely speculative, but of practical influence on the inhabitants of this country. Every attempt therefore to correct it may expect a favourable reception, and an attentive consideration.

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TABLE I.
OF THE
CASES OF PATIENTS
ADMITTED AT THE
PLYMOUTH PUBLIC DISPENSARY,
FROM NOVEMBER 13, 1798,
TO AUGUST 31, 1805.

TABLE I.

OF THE

CASES OF PATIENTS

ADMITTED AT THE

PLYMOUTH PUBLIC DISPENSARY

FROM NOVEMBER 1870

TO AUGUST 1871

TABLE I.

Of the Cases of Patients admitted at the Plymouth Public Dispensary, from November 13, 1798,
to August 31, 1805.

[The Asterisk prefixed to a number denotes a reference to the corresponding number in the notes subjoined to the Table.]

	DISEASES.	1799	1800	1801	1802	1803	1804	1805	Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.
1	Abortus	1	2	1		1			5			
2	Amaurosis		1	2	1			1	5			
3	Amenorrhæa	19	15	32	15	22	17	14	134			
4	Anasarca	6	17	22	15	10	12	11	93	9	1 in 10	1 to 36
5	Angina Pectoris			1					1			
6	Aphonia					1			1			

	DISEASES.	1799	1800	1801	1802	1803	1804	1805	Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.
7	Aphtha . . .		1	2		1			4	1	1 in 4	1 to 321
8	Apoplexia . . .	1	3	1	1	2	2	2	12	10	10 in 12	1 to 32
*9	Apoplexia Hydrocephalica	1		3	1		1		6	4	2 in 3	1 to 80
10	Arthritis . . .	1		1			1		3			
11	Arthropuosis . . .							1	1			
12	Ascites . . .	4	6	4	1		2	2	19	4	1 in 5	1 to 80
*13	Asthenia . . .	4	25	22	16	18	15	10	110			
14	Asthma . . .		2	2	2	4	1	2	13	1	1 in 13	1 to 321
15	Atrophia . . .	2				2	1		5	4	4 in 5	1 to 80
16	Bronchocele . . .					1	1		2			

*17	Caligo corneae	8	5		2	2	3	2	22				
*18	Caligo lentis	1	1			1			3				
*19	Cancer scrofi				1				1				
20	Catarrhus	21	25	15	22	9	18	32	142				
*21	Catarrhus epidemicus					40			40	-1	1 in 40		1 to 321
22	Cephalaea	7	7	9	4	8	6	5	46				
23	Cholera	1	10	13	5	3	7	2	41	1	1 in 41		1 to 321
*24	Chorea	2	3		3	1		1	10				
25	Colica	2	4	6	8	7	3	3	33	1	1 in 33		1 to 321
26	Colica Pictonum			2	1				3				
27	Convulsio		1	1	1	5		1	9	3	1 in 3		1 to 107
28	Cynanche tonsillarum	1	5	3	4	2	3	4	22				

	DISEASES.										Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.	
	1799	1800	1801	1802	1803	1804	1805								
29			1				1					2	1	1 in 2	1 to 321
30	1		1	1		3	1					7			
31			1	1								2			
32	23	39	48	34	46	35	31					256	9	1 in 28	1 to 36
33	1		2	1	1		1					6			
34		1	3		2	1						7			
35	1			1		2	1					5			
36	34	31	27	22	13	43	41					211			
37		1			1							2			
38	31	56	31	28	28	31	24					229	16	1 in 14	1 to 20

*39	Dysuria	1	3	5	6	3	4	2	24	3	1 in 8	1 to 107
40	Ecthyma		1	1			5		7			
41	Enteritis					1			1	1	1 in 1	1 to 321
42	Enuresis	3	3		3	1	1		11			
43	Epilepsia	2	8	9	3	6	4	3	35	1	1 in 35	1 to 321
44	Epistaxis			1	1	1	2	1	6			
45	Erysipelas		5	2	3		1		11			
46	Erythema	1	1	1		1	3		7	1	1 in 7	1 to 321
*47	Febris	27	52	79	36	34	20	21	269	20	1 in 13	1 to 16
*48	Gangraena							1	1	1	1 in 1	1 to 321
*49	Gastrodynia	5	3	10	7	5	7	4	41			
50	Gonorrhœa		7	1		1	3	2	14			

DISEASES.	1799	1800	1801	1802	1803	1804	1805	Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.
51 Hæmatemesis	1	1		3	1	1		7			
52 Hæmaturia		1						1			
53 Hæmoptysis	2	5	9	5	1	4	1	27	2	1 in 13	1 to 160
54 Hæmorrhoids	5	3	3	5	6	1	2	25			
55 Hectica lactantium	1	2	1		1	1		6			
56 Hepatitis				1				1			
57 Hepatitis chronica		1			1			2			
58 Hernia	1	2	1	3		2	2	11	2	2 in 11	1 to 160
59 Herpes		2		5				7			
*60 Hydarthrus	2		1			4	3	10			

61	Hydrocephalus	1	1	1	1	1	1	3	4	2 in 5	1 to 90
*62	Hydrometra	1	1					1			
63	Hydrothorax	1	2	1	1	1	3	10	4		
64	Hypochondriasis		1		1			5			
*65	Hysteralgia				1			1			
66	Hysteria	18	5	11	7	1	9	51			
67	Icterus	6	3	5	6	1	3	27			
68	Impetigo							3			
69	Ischuria	2	2			1	2	8	1	1 in 8	1 to 321
70	Licken					3		4			
71	Lithiasis				2	1		3			
72	Lepra	2	1	4			2	10			

	DISEASES.	1799 1800 1801 1802 1803 1804 1805										Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.
		1799	1800	1801	1802	1803	1804	1805							
73	Leucorrhœa . . .	3	8	3	5	2	10	3				34			
74	Mania & Melancholia . . .		1	1		1						3			
*75	Melena . . .				1							4	2	1 in 2	1 to 160
76	Menorrhagia . . .	3	9	10	4	12	8	4				55	3	1 in 18	1 to 107
77	Nephralgia . . .		9		2			2				13			
78	Obstipatio . . .	3	2			5	8	6				24			
79	Odontalgia . . .		2		1							3			
*80	Oedema puerperale . . .	2	1			1	1	1				6			
81	Ophthalmia . . .	8	11	18	5	10	16	15				83			
. 82	Palpitatio . . .		1		1		1	2				5	1	1 in 5	1 to 321

83	Paralysis	6	7	8	8	8	7	4	40			
84	Peritonitis puerperarum		1						1			
85	Pertussis	19	6	21	7	3	7	3	60	9	1 in 7	1 to 36
86	Phthisis	27	26	24	24	32	33	32	198	75	1 in 2.6	1 to 4.3
87	Pica			1	1				2			
*88	Pleurodyne	5	14	5	5	4	5	4	48			
89	Pneumonia	9	21	19	18	17	17	18	126	21	1 in 6	1 to 15
90	Pneumonia notha		3	6		3		3	12	1	1 in 12	1 to 321
*91	Pompholyx				1				1			
92	Porrigo		3	4	6	5	5	7	36			
93	Prolapsus ani			1	1	1		1	2			
94	Prolapsus uteri	2	3	3		1	2	1	12			

DISEASES.	1799 1800 1801 1802 1803 1804 1805										Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.
	1799	1800	1801	1802	1803	1804	1805							
95 Prurigo			2	1	6	2	1				12			
96 Psoriasis	6	2	2	4	6	2	1				23			
97 Ptyalismus	1	1			1						3			
*98 Purpura	1		1			1					3			
99 Quartana							1				1			
100 Rachitis	3	8	3	4			1				19	1	1 to 321	
101 Rheumatismus acutus	13	16	10	9	11	12	17				88			
102 Rheumatismus chronicus	20	32	17	17	19	32	23				160			
103 Rubecola	6	3	40	3	2	15	2				71	6	1 to 53	
104 Scabies	1	13	15	8	19	4	4				64			

*105	Scarlatina cynanchica . . .	1	5	1		1	17	38	63	5	1 in 13	1 to 64
106	Schirrhus mammae . . .		2			3	1		6			
107	Scrofula . . .	7	8	6	3	3	5	9	41			
*108	Stomacae . . .	1			1	1			3			
109	Strophilus . . .		1			1			2			
110	Syphilis . . .	11	10	18	22	14	6	4	85	2	1 in 42	1 to 160
111	Tabes . . .	2	4	7	1	6	4	7	31	9	1 in 3.5	1 to 36
112	Tertiana . . .	3		1	2		3		9			
*113	Tetanus . . .			1					1	1	1 in 1	1 to 321
*114	Trichiasis . . .		1						1			
115	Trichoma . . .		1						1			
116	Tympanites . . .	1						2	3	2	2 in 3	1 to 160

DISEASES.	1799	1800	1801	1802	1803	1804	1805	Total.	Number of deaths.	Proportion of deaths from each disease.	Proportion of deaths from each disease to the whole mortality.
117 Typhus	10	36	56	54	31	26	5	218	36	1 in 6	1 to 9
118 Urticaria			1	3		2	1	8			
119 Variola	7	16	24	18		41	6	112	46	1 in 23	1 to 7
120 Varix	1							1			
121 Vermes	9	8	13	9	7	2	2	50			
Total of cases enumerated in the preceding columns	438	682	720	561	541	585	483	4010	321		
Total of cases not included in the preceding columns, the names of the diseases having been omitted in the Register of the Dispensary	21	56	80	136	69	7	30	399			
Total	459	738	800	697	610	592	513	4409	321		

NOTES ON TABLE I.

9. *Apoplexia Hydrocephalica*.—By the adoption of this appellation for the hydrocephalus acutus, vel internus, of the earlier authors, it is not intended to subscribe to the propriety of its application. For this species of inflammation of the brain, peculiarised by its termination in effusion, some distinctive name seems wanting. Is hydrocephalitis admissible?

13. *Asthenia*.—Sauvages Nos. Meth. cl. 6. gen. 21. See also observations referrible to this title in Willan's Reports on the Diseases in London, p. 52.

17, 18. *Caligo corneæ, Caligo lentis*.—The first species includes those cases of obscuratio of the transparent cornea, which are the

quent consequences of ophthalmia, and are distinguished by the terms macula, leucoma, &c. The second comprehends cataract.

19. *Cancer scroti*.—This case occurred in a chimney-sweeper of advanced age; the ulcerated part was of small extent, and was removed by excision.

21. *Catarrhus epidemicus*.—Influenza.

24. *Chorea*.—This has been said to be a frequent disease in England. In Scotland it is of rare occurrence. The number of cases in the present instance has a tendency to confirm the former observation. In one of these instances the disease had its origin distinctly in terror, in a boy of eleven years of age, in whom it first occurred during Lord Duncan's action with the Dutch fleet. In some of these cases evident benefit appeared to be derived from the continued use of nitrat of silver, which has almost invariably disappointed my hopes in epilepsy. This might reasonably be expected from a due consideration of the nature of the two diseases, and of the probable mode of operation of the medicine.

39. *Dysuria*.—To account for the fatal cases in this instance it may be mentioned, that

under this title are included diseases of the bladder, arising from different causes. See Cullen Nos. Meth. gen. 124, sp. 5 & 6.

47. *Febris*.—Under no title in the list is the arrangement so liable to exception as in this, to which so considerable a number of cases has been referred; and in the contemplation of it was made the previous remark, that nosological accuracy had not been aimed at. A large proportion of these cases consists of such, as by reporters are frequently styled “acute diseases of children;” a vague and unsatisfactory title, but possibly warranted by the imperfect state of our knowledge of their complaints. To these must be added the slighter febrile affections of adults, arising from cold, or other causes; and those cases, in which the symptoms of fever, being the chief object of practice, were principally regarded, the primary disease being at the time of admission doubtful or obscure.

48. *Gangræna*.—Mortification of the toes and feet. Pott’s Works, &c.

49. *Gastrodynia*.—Perhaps these cases should in strictness have been referred to dyspepsia; but the symptom by which they are here charac-

terized is often so predominant, as to entitle them to a distinctive appellation. In many instances of this most pertinacious complaint, which occurs almost exclusively in females, the pain of the stomach has entirely arisen from an inordinate use of tea, and has ceased on discontinuing this beverage.

60. *Hydarthrus*.—Disease of the knee-joint—white swelling.

62. *Hydrometra*.—Sauvages. Gen. 289, sp. 2. *Hydrometra gravidarum*.

65. *Hysteralgia*.—Sauvages. Gen. 209, sp. 6.

75. *Melæna*.—Of the four cases here set down, two are not strictly referrible to the genus *melæna*, the characteristic hæmorrhage not having in those cases occurred. They are so associated, in defect of a more appropriate situation, because the disease in those instances was deemed to consist in that condition of the vessels of the system of the vena portarum, which precedes the hæmorrhage in *melæna*. They were the cases also which terminated fatally.

80. *Oedema puerperale*.—White—Trye—Willan, 324—Hull on *Phlegmatia dolens*.

88. *Pleurodyne*.—The reference of so many cases to this title of Sauvages, which Cullen has not thought entitled to a generic distinction, is another instance of no very strict attention to nosological precision. It is designed in this place to include some cases, which ought perhaps to have been referred to rheumatism, to which Cullen assigns all the species of Sauvages; some, which were sequels of pneumonic inflammation; and others, in which neither the precise seat, nor nature of the complaint, was easily to be ascertained.

91. *Pompholyx*.—In a recent case of this kind, which has subsisted many months, the vesications have occupied in succession almost every part of the surface; chiefly the breasts at first; latterly the belly, thighs, and feet. That the stomach, uterus, ovaria, and urinary bladder, have also participated in the disease, has been rendered highly probable by the occurrence of disordered function of those organs. The disease supervened a sudden suppression of the menstrual discharge, which has not been restored. Sometimes blood, sometimes a watery fluid, is thrown up from the stomach. A considerable and painful tumour has taken place in the left hypogastrium; and no urine has been discharged during several

weeks without the aid of the catheter. In some few instances of this disease, described under the name of chronic pemphigus, there has been suspected to subsist a connexion with disorder of the uterine functions, in the opposite conditions of menorrhagia and amenorrhæa.

98. *Purpura*.—Phænigmus petechialis, Sauv. 308—Hæmorrhæa, Adair Dissert. Inaug. de Hæmorrhæa petechiali, Edin. 1789—Petechiæ sine febre—Purpura, Willan's Reports, p. 90.

105. *Scarlatina*.—The identity of scarlatina anginosa and cynanche maligna, being admitted, there can be little hesitation in classing the disease with the exanthemata, rather than with the phlegmasiæ; and consequently of employing scarlatina, rather than cynanche, as the generic term.

108. *Stomacace*.—Sauvages. Gen. 241, sp. 1.

113. *Tetanus*.—In a recent case of this disease, the event was favourable. In the history of it the following circumstances seemed worthy of attention. The disease arose from severe contusion of the fore-finger, commencing about four weeks after the infliction of the injury. At the expiration of another week,

when assistance was first applied for, there was no external wound, but the last joint was considerably enlarged. From the amputation of the finger some degree of alleviation of the symptoms was the immediate consequence. From the combined and continued use of wine, bark, and affusion of cold water, decided benefit was judged to be derived. From the application of tincture of tobacco to the external fauces, the rigidity of the muscles was for a time evidently diminished, and pain mitigated. From opium, in doses from one to three hundred drops, and to the extent of two ounces and a half of the tincture, in seventy-two hours, no benefit was apparently derived; and its effect in producing distressing dysuria could not be doubted. From the use of digitalis, by which the frequency of the pulse was reduced, some advantage seemed to be gained. The active treatment of the complaint occupied three weeks: the recovery was complete. The patient was a strong man, about twenty-five years of age. In the conduct of the case the narrator was assisted by the judicious advice of his friend and colleague, Dr. Remmett, Physician Extraordinary to the Institution in which it occurred.

114. *Trichiasis*.—"Est directio ciliorum versus oculi bulbum." Plenck. de Morbis Oculorum.

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 Dr. Bennett, Physician Extraordinary to the
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114. *Typhlopharyngitis*.—*Phlegm. de Albidis Oculorum*.
Oculi bulbum.

TABLE II.

OF THE

DISEASES

CONTAINED IN TABLE I.

**ARRANGED IN THE ORDER OF THEIR FREQUENCY OF
OCCURRENCE.**

TABLE II.

OF THE

DISEASES

CONTAINED IN TABLE I.

ARRANGED IN THE ORDER OF THEIR FREQUENCY OF

OCURRENCE.

TABLE II.

1	FEBRIS	269	9	Phthisis	198
2	Diarrhæa	256	10	Catarrhus	142
3	Dyspepsia	211	11	Pneumonia	126
4	Gastrodynia	41	12	Pneumonia notha	12
5	Rheumatismus acutus	88	13	Amenorrhæa	134
6	Rheumatismus chronicus	160	14	Anasarca	93
7	Dyspnæa	229	15	Ascites	19
8	Typhus	218	16	Hydrothorax	10

17	Variola	112	41	Tabes	31
18	Asthénia	110	42	Hæmoptysis	27
19	Ophthalmia	83	43	Icterus	27
20	Caligo corneæ	22 } 105	44	Hæmorrhoids	25
21	Syphilis	85 } 99	45	Dysuria	24
22	Gonorrhœa	14 } 99	46	Obstipatio	24
23	Rubcola	71	47	Psoriasis	23
24	Scabies	64	48	Cynanche tonsillaris	22
25	Scarlatina cynanchica	63	49	Rachitis	19
26	Pertussis	60	50	Asthma	13
27	Menorrhagia	55	51	Nephralgia	13
28	Hysteria	51	52	Apoplexia	12

29	Vermes	50	Prolapsus uteri	12
30	Pleurodyne	48	Prurigo	12
31	Cephalæa	46	Enuresis	11
32	Cholera	41	Erysipelas	11
33	Scrofula	41	Hernia	11
34	Catarrhus epidemicus	40	Chorea	10
35	Paralysis	40	Hydarthrus	10
36	Colica	33 } 36	Lepra	10
37	Colica Pictonum	3 }	Convulsio	9
38	Porrigo	36	Tertiana	9
39	Epilepsia	35	Ischuria	8
40	Leucorrhæa	34	Urticaria	8

65	Cynanche parotidæa	7	89	Hepatitis	1	3
66	Dysenteria	7	90	Hepatitis chronica	2	3
67	Ecthyma	7	91	Impetigo . . . . .	.	3
68	Erythema	7	92	Lithiasis . . . . .	.	3
69	Hæmatemesis	7	93	Mania & Melancholia . . . . .	.	3
70	Herpes	7	94	Odontalgia . . . . .	.	3
71	Apoplexia hydrocephalica	7	95	Purpura . . . . .	.	3
72	Dysecoea	6	96	Ptyalismus . . . . .	.	3
73	Epistaxis	6	97	Stomacace . . . . .	.	3
74	Hectica lactantium	6	98	Tympanites . . . . .	.	3
75	Oedema puerperale	6	99	Bronchocele . . . . .	.	2
76	Schirrhus mammæ	6	100	Cynanche trachealis . . . . .	.	2

77	Abortus	5	101	Diabetea	2
78	Amaurosis	5	102	Dysphagia	2
79	Atrophia	5	103	Pica	2
80	Dysmenorrhæa	5	104	Prolapsus ani	2
81	Hypochondriasis	5	105	Strophilus	2
82	Palpitatio	5	106	Angina pectoris	1
83	Aphtha	4	107	Aphonia	1
84	Lichen	4	108	Arthropuosis	1
85	Melena	4	109	Cancer scroti	1
86	Arthritis	3	110	Enteritis	1
87	Callgo lentis	3	111	Gangræna	1
88	Hydrocephalus	3	112	Hæmaturia	1

113	Hydrometra	1			Tetanus	1
114	Hysteralgia	1			Trichiasis	1
115	Peritonitis puerperarum	1			Trichoma	1
116	Pompholyx	1			Varix	1
117	Quartana	1			Total	<u>4010</u>

TABLE III.

OF THE

DISEASES

CONTAINED IN TABLE I.

IN WHICH FATAL EVENTS OCCURRED,

ARRANGED IN THE ORDER OF THEIR FATALITY

RELATIVELY TO EACH OTHER.

TABLE III.

OF THE

DISEASES

CONTAINED IN TABLE I.

IN WHICH FATAL EVENTS OCCURRED.

ARRANGED IN THE ORDER OF THEIR RARITY
RELATIVELY TO EACH OTHER.

TABLE III.

1	PHTHISIS	.	.	75	10	Apoplexia	.	.	10
2	Variola	.	.	46	11	Diarrhæa	.	.	9
3	Typhus	.	.	36	12	Pertussis	.	.	9
4	Pneumonia	.	.	22	13	Tabes	.	.	9
5	Febris	.	.	20	14	Rubeola	.	.	6
6	Anasarca	.	.	9	15	Scarlatina cynanchica	.	.	5
7	Ascites	.	.	4	16	Apoplexia hydrocephalica	.	.	4
8	Hydrothorax	.	.	4	17	Atrophia	.	.	4
9	Dyspnæa	.	.	16	18	Convulsio	.	.	3

19	Dysuria	.	.	3	30	Colica	.	.	1
20	Menorrhagia	.	.	3	31	Cynanche trachealis	.	.	1
21	Hæmoptysis	.	.	2	32	Enteritis	.	.	1
22	Hernia	.	.	2	33	Epilepsia	.	.	1
23	Melena	.	.	2	34	Erythema	.	.	1
24	Syphilis	.	.	2	35	Gangrena	.	.	1
25	Tympanites	.	.	2	36	Ischuria	.	.	1
26	Aphtha	.	.	1	37	Palpitatio	.	.	1
27	Asthma	.	.	1	38	Rachitis	.	.	1
28	Catarrhus epidemicus	.	.	1	39	Tetanus	.	.	1
29	Cholera	.	.	1		Total	.	.	321

TABLE IV.

OF THE SAME

DISEASES AS IN TABLE III.

ARRANGED IN THE ORDER OF THEIR FATALITY,

RELATIVELY TO THE NUMBER OF CASES OF EACH DISEASE, AS STATED IN THE LAST COLUMN OF TABLE I.

TABLE IV

OF THE

DISORDER AS IN TABLE III

ARRANGED IN THE ORDER OF THEIR FATALITY

RELATIVELY TO THE NUMBER OF CASES OF EACH TYPE

AND AS STATED IN THE LAST COLUMN OF TABLE III

TABLE IV.

1	ENTERITIS	10	Variola	1 in 2.43
2	Gangræna	11	Hydrothorax	1 in 2.5
3	Tetanus	12	Phthisis	1 in 2.61
4	Apoplexia	13	Convulsio	1 in 3
5	Atrophia	14	Tabes	1 in 3.44
6	Apoplexia hydrocephalica	15	Aphtha	1 in 4
7	Tympanites	16	Palpitatio	1 in 4.25
8	Melæna	17	Ascites	1 in 4.75
9	Cynanche trachealis	18	Hernia	1 in 5.5

19	Typhus	1 in 6	30	Hæmoptysis	1 in 13.5
20	Pneumonia	1 in 6.3	31	Dyspnæa	1 in 14.3
21	Pertussis	1 in 6.66	32	Menorrhagia	1 in 18.3
22	Erythema	1 in 7	33	Rachitis	1 in 19
23	Dysuria	} 1 in 8	34	Diarrhæa	1 in 28.2
24	Ischuria		35	Colica	1 in 33
25	Anasarca	1 in 10.3	36	Epilepsia	1 in 35
26	Rubeola	1 in 11.8	37	Catarrhus epiderpicus	1 in 40
27	Scarlatina cynanchica	1 in 12.6	38	Cholera	1 in 41
28	Asthma	1 in 13	39	Syphilis	1 in 42
29	Febris	1 in 13.45			

TABLE V.
 OF THE
 PROPORTION OF FATAL CASES,
 IN EACH OF THE SEVEN YEARS,
 FROM NOVEMBER 13, 1799,
 TO AUGUST 31, 1805.

Years.	Fatal Cases.	Total Cases.	Proportion.
1799	36	459	1 in 12.5
1800	44	738	1 in 16.5
1801	52	800	1 in 15.4
1802	54	697	1 in 12.8
1803	42	610	1 in 14.5
1805	50	592	1 in 11.8
1806	43	513	1 in 12
7	321	4409	1 in 13.7

TABLE V
 OF THE
 PROPORTION OF FATAL CASES
 IN EACH OF THE SEVEN YEARS
 FROM NOVEMBER 1, 1892

Year	Total Cases	Fatal Cases	Proportion
1892	179	36	20.1%
1893	160	34	21.3%
1894	161	32	19.9%
1895	152	30	19.7%
1896	147	28	19.0%
1897	138	26	18.9%
1898	127	24	18.9%
1899	118	22	18.6%
1900	109	20	18.3%

PART I.
OF THE
FREQUENCY AND FATALITY
OF
DIFFERENT DISEASES,
PARTICULARLY OF THE
PROGRESSIVE INCREASE OF CONSUMPTION.

PART I

PART I

OF THE

FREQUENCY AND FATALITY

OR

DIFFERENT DISEASES

IN THE

PROGRESSIVE INCREASE OF CONSUMPTION

PART I.

IN subjoining a few remarks to the preceding tables, it is not intended to enter into a regular or detailed examination of their correspondence with, or variation from, similar documents; but merely to advert to some leading particulars somewhat more fully, than could conveniently be done in the notes attached to the tables themselves.

In considering the prevalence of diseases, it will be obvious that those which, in an extensive sense of the term, may be classed under the title of pulmonary disorders, claim the first attention, no less from their number, than from their fatality.

Whether the proportion of these complaints be notwithstanding less in this*, than in other parts of the island, as from the reputed mildness of our western air might naturally be expected, a deficiency of adequate information precludes any attempt to determine. But an inspection of these tables will, it is feared, afford little or no ground to impeach the correctness of those statements, in which the mortality, occasioned by the chief of this class of diseases, has been estimated at a rate so high, as almost to exceed belief, and to cast a shade of suspicion on the credibility of any conclusions deduced from them. If however the facts, hereafter adduced, should be found inconsistent with a claim to any considerable exemption from the ravages of pulmonic distempers, it will scarcely be denied, that much less extensive, than from local considerations might have been expected, has been the prevalence of another disease, the destructive influence of which has of late

* The south-west part of Devonshire, in the vicinity of Plymouth.

been an object of much and fortunate attention in several populous towns in the kingdom.

The predominance of PULMONARY COMPLAINTS will be evident from an inspection of the first and second tables. The proportion of cases of this description, extensively taken, will be found to be to the whole as 1 to 5; and if the cases referred to the heads catarrhus, influenza, and pleurodyne, be excluded, the proportion resulting from the remainder, viz. asthma, dyspnæa, hæmoptysis, pertussis, phthisis, and pneumonia, will be as 1 to 6-7. If influenza be excluded, on account of its occasional and uncertain occurrence, and pleurodyne for the reasons which may be collected from the note on that title in the first table; while, on the contrary, catarrh is retained, because the cases of this complaint, admitted at a dispensary, are likely to be of the severer kind, and bordering upon a more formidable disease; the relation subsisting between pulmonary, and all other complaints collectively, may then be stated as 1 to 5-4.

The importance of pulmonic complaints, thus evinced by their proportionate prevalence, is still more forcibly demonstrated by contemplating their proportional fatality. From the third table it may be collected, that this proportion is as 1 to 2-5. From the result of his extensive practice, public and private, mentioned in his Reports on the Diseases in London, in confirmation of the conclusions deducible from the bills of mortality, Dr. Willan states the relative fatality of pulmonic distempers, exclusively of hooping-cough, and cough succeeding measles, to have been about 1 to 3. If the deaths from those sources had not been excluded, the subsisting relation would then have been precisely similar to that just stated. On an average of six years, the proportion deduced from the bills of mortality is as 1 to 3-1, which is probably less than it ought to be, owing, as it may be suspected, to an error, diminishing the deaths from pleurisy. From the very trifling number of deaths attributed to this disease, it seems probable, that cases of pneumonia are very commonly classed with fevers.

In considering the prevalence and ravages of pulmonary disorders, in general our attention is irresistibly directed to the FREQUENCY AND FATALITY OF PULMONARY CONSUMPTION.

The relative occurrence of phthisis appears, from the first table, to be as 1 to 22-27; and on an average of three years, in Dr. Willan's practice, it is found to have been as 1 to 29. Of its relative occurrence in other places data are wanting, on which to institute a comparison; but of its relative fatality the following instances have been collected. From a due consideration of these it will too certainly appear that no exaggeration can be ascribed to that article in the bills of mortality, which records the desolating effects of this insidious disease, the baleful influence of which is probably extending in constant progression over the British islands, and countervailing that gradual diminution of the portion of human affliction arising from disease, which, we have reason to hope, is otherwise effecting by

the combined operation of various causes ; among which the happy discoveries in preventive medicine, that mark the close of the past century, claim a distinguished share*.

* May not the discovery of the cow-pock, if it should ultimately effect the extermination of the small-pox, which it may do when the prejudices of mankind shall permit, be welcomed rather on account of the influence here ascribed to it in diminishing human suffering, than on account of its effect in diminishing human mortality ? Since disease is one of the appointed checks to excessive population, and the plan of Providence in the creation of human life requires the termination of the existence of one-third of its creatures, before they have attained the age of two years, it may be doubted whether the annihilation of so efficient an instrument as small-pox can be admitted, without the substitution of some other equally destructive malady. The substituted malady may indeed be productive of less collateral affliction, than the loathsome distemper whose place it supplies. But granting that no direct substitute should arise, it will not follow that disease in general will be deprived of its accustomed share in checking population ; and if it be not, the only difference will be in the proportion of victims submitted to other disorders. The infant rescued from small-pox, may be rescued only to perish in childhood by measles or scarlatina, or be preserved to swell the list of youthful victims to the insatiate maw of consumption. Yet in estimating the afflictive effects of a disease on mankind, its absolute fatality may

The following table consists of two parts. In the first part are selected, from the bills of mortality, the absolute and relative numbers of deaths from consumption, at different periods, in the course of the last century and half; in the second part are collected a few instances, casually obtained, of similar mortality in different places in the kingdom, during the latter part of the past century.

be a very subordinate consideration, as might be exemplified in the instance of cancer. Much depends on the condition and relations of the persons obnoxious to it. The mortality from consumption and small-pox being supposed equal, and inoculation yet undiscovered, if superior power were to propose the annihilation of one or other of these distempers, no competent judge of their effects, actuated by benevolent motives, would hesitate, I presume, to solicit the extermination of the former. This speculation on its influence on population is totally foreign from the question of the merits and advantages of vaccination, which, in my estimation, are placed beyond all cavil. Perhaps to the speculation itself it may be quite sufficient to oppose the reply, a little altered, of the Princess to Rasselas, "How the world is to be *de-peopled* is not my care, and needs not be your's."

TABLE VI.—PART I.

Bills of Mortality.	Deaths from Consumption.	Annual Average.	Total Mortality.	Proportional Mortality from Consumption.
¹ 7 years, 1650 — 1656	17,642	2,520	80,438	1 to 4. 6
¹ 5 years, 1696 — 1700	17,044	3,408	100,029	1 to 5. 8
¹ 7 years, 1746 — 1752	30,842	4,406	168,276	1 to 5. 4
² 5 years, 1763 — 1767	21,563	4,312	119,024	1 to 5. 5
³ 10 years, 1790 — 1799	50,480	5,048	196,705	1 to 3. 8927
² 5 years, 1795 — 1799	24,161	4,832	93,776	1 to 3. 8
¹ 6 years, 1795 — 1800	29,864	4,977	116,338	1 to 3. 9
			⁴ 3810	
			113,028	1 to 3. 8

¹ The statements in these periods are taken from Willan's Reports on the Diseases in London.

² From Heberden's Observations on the Increase and Decrease of different Diseases.

³ From Beddoes Hygeia, and Essay on the Causes of Consumption.

⁴ Abortive and still-born, which having been specified in this instance, are deducted, as they always ought to be. Whether this necessary deduction has been made in the other instances is not known, but the omission cannot materially affect the general result.

TABLE VI.—PART II.

Bills of Mortality.	Deaths from Consumption.	Annual Average.	Total Mortality.	Proportional Mortality from Consumption.
¹ Holycross, } 10 years, 1750 — 1759,	47	4.7	290	1 to 6
in } 10 years, 1760 — 1769,	101	10	365	1 to 3.
Shropshire, } 10 years, 1770 — 1779,			311	1 to 5
² Chester, . . . 2 years, 1772 — 1773,	135	67	731	1 to 5
³ Shrewsbury, 10 years,				1 to 4
⁴ Bristol,	683		1654	1 to 2
⁵ Bristol, . . . 7 years, 1790 — 1796,	683	97	1511	1 to 2
⁶ London, . . . 2 years, 1795 — 1796,	77	38	246	1 to 3
⁷ Plymouth, . . 7 years, 1799 — 1805,	75	10.7	321	1 to 4
⁸ Ackworth, } 10 years, 1747 — 1756,	23	2.3	107	1 to 4
in } 10 years, 1757 — 1766,	38	3.8	156	1 to 4
Yorkshire,				
⁹ Warrington, 1 year, 1773,	96		¹⁰ 288	1 to 3

NOTES ON TABLE IV.—PART II.

¹ This instance of Holycross is stated in the seventh Essay of Hygeia, as a strong proof of the increase of consumption. No doubt it is so; but by an error in the figures the increase is there considerably overrated.—See Phil. Trans. vols. 52 and 61. The parish of Holycross contains in it a village, which is part of the suburbs of Shrewsbury. It is six miles in circumference, half of which lies along the banks of the Severn. The register of this parish was kept, during thirty years (1750 to 1780), with singular care and accuracy, by the Rev Mr. Gorsuch, the vicar. No strangers happening to die in this parish, or persons brought in to be buried, were inserted in this private register; nor any of the fixed inhabitants omitted, though carried out to be buried. The inhabitants, consisting chiefly of labouring people, had amounted, with very little variation, to about 1050, during the twenty years, of which the first ten preceded the commencement of this register. Emigration corresponded to the increase of the births above the burials, which were as 15 to 13. In 1800 the population is stated to have been 1200.

² Haygarth, Phil. Trans. vol. 64, 65; Hygeia, 7. 58. "Strict injunctions were given," says Dr. Haygarth, "that no disorder, unless attended with cough, should be called consumption."

³ Hygeia, 7. 6. Essay on Consumption.

⁴ Hygeia, 7. 6.

⁵ Essay on the Causes of Consumption, p. 4. This is supposed to be a corrected statement of the preceding.

⁶ Willan's Reports on the Diseases in London, p. 84.

⁷ Table I.

⁸ Price on Reversionary Payments, vol. ii. p. 375.

⁹ Phil. Trans. vol. 64.

¹⁰ The actual number of deaths in this year was 473; but of these 211 were occasioned by epidemical small-pox. In reducing the number to 288, it still remains above the average of the three preceding years.

From the first part of the preceding table it appears, that the absolute and relative mortality from consumption has been regularly increasing during the last century; though it seems to have been considerably less in its relative proportion at the commencement of this period, than it had been fifty years before. Dr. Heberden has stated this augmentation, in a gross way, by the following figures, the total mortality in each instance being 21,000.

Deaths from Consumption.

At the beginning of the 18th century, 3000 = 1 to 7.

At the middle of the 18th century, . 4000 = 1 to 5. 25.

At the end of the 18th century, . 5000 = 1 to 4. 2.

If he is correct in his statement of the proportion in the first period, there must have been a great decrease in deaths from consumption in the first years of the century, since the relation in the last five years of the preceding century is, as stated in the table. 1 to 5. 8. On the contrary, in stating the proportion in the third period as 1 to 4. 2, he is not supported by the average of the last ten years of the

century, which makes it as 1 to 3. 8. As there is much reason to believe that the general mortality has for some time been on the decrease, relatively to the increasing population of the country, it admits of a question, whether the number of deaths from consumption, which, relatively to the deaths from all other causes, is without doubt very considerably augmented, is in reality increased, relatively to the population of the country. In other words, does a larger proportion of the inhabitants of this island fall a victim to this disease at present, than did at the close of the seventeenth century*?

* Many arguments might be mentioned, which would a priori have rendered probable the extension of this disease. Of this sort is the argument drawn from hereditary disposition, which, if admitted, must be allowed to have considerable influence. In an opulent and flourishing country, where population is on the increase, many weakly children will be reared, who, in a less improved state of society, must have perished in early infancy; and consequently there will be a larger proportion of adults obnoxious to a disease of this description. In such a country a much larger proportion of the people will be occupied in sedentary employments, in manufactories subservient to the arts of luxury and refinement. The altera-

That consumption has for some time been, and still is, an increasing disease in this island, is presumed from the increased relation of deaths from this disease to the whole mortality at the present period, contrasted with the relation it bore at different periods in the last century and half, as exhibited in the bills of mortality. Assuming the variation in this relation to be a just measure of the absolute increase and decrease of the disease, it will appear from an inspection of the first part of the sixth table, that at the close of the seventeenth century the consumptive mortality was less than it had been in the middle of that century, by nearly one-sixth part; that in the middle of the eighteenth century it had somewhat increased, but was still considerably less than it had been an hundred years before; but that at the close of this century its increase had been so great, as not only to equal the mortality in the

tion in diet and clothing affords arguments of an equivocal nature. How long this may be the case in the latter instance is perhaps not doubtful. The female costume of Greece is indeed elegant, but our climate is not Attican.

first period, but to exceed it by nearly one-fifth. The relations of the mortality at these four periods, or half centuries, in the succession above stated, correspond to the following numbers, 48, 58, 54, 38.

To the assumption of this increase of the relative mortality, as a measure of the real increase of consumptive mortality, two objections occur. First, it may be said, that the increase of consumption within the bills of mortality is no proof of its general increase in the kingdom at large, since this may be attributed to the operation of local causes; and, secondly, it may be stated, that an increase in the proportion of mortality from one disease to the whole mortality, is no proof of its absolute increase; since the apparent augmentation in the former may have arisen from a real reduction of the latter.

Each of these objections is entitled to attention.

To the first it may be replied, that al-

though the ratios of consumptive mortality in a crowded metropolis may not at any period be a measure of relation justly applicable to the kingdom at large, yet that those ratios may justly be compared with each other at different periods ; and, that from the comparison may be formed a scale of variation, which may be justly applied as a measure of increase and decrease to the whole kingdom, unless any material change can be supposed to have taken place in the local circumstances of the metropolis within the period. It is not, however, obvious that any such change has taken place in regard to London. The improvement of the city, after the great fire in 1666, certainly tended greatly to the increase of its salubrity, and might, perhaps, contribute to the relative decrease of consumptive mortality which is observed after that period, although its known influence in putting a stop to the prevalence of plague, and in mitigating the ravages of other contagious distempers, by which the sum of the general mortality must have been diminished, would rather

lead to a different conclusion. But what local change of circumstances has occurred in London in the last thirty years, to which, with any plausibility, can be attributed the great increase of consumptive mortality within that period? Great as the addition to its population has been, equally great has been the extension of its buildings; and there is little reason to believe that the inhabitants are now more crowded than they were formerly. On the contrary, the local improvement of the metropolis is believed, by the most competent judges, to have contributed largely to its general salubrity; and it seems highly improbable that to the same local circumstances should be owing an increase of mortality from one disease, and a diminution from all others. Such a consequence might indeed seem to be involved in the rapid increase of the population of the metropolis, because the emigration from the country, by which this increase is made, takes place chiefly at that period of life, which is deemed most liable to the invasion of phthisical disease. This cir-

cumstance may perhaps account for the greater proportion of phthisical mortality in London, compared with the country, and other towns of less magnitude; but cannot be allowed to have any influence on the relations subsisting in London at different periods, because the metropolis must at all times have drawn its recruits from the country under similar circumstances.

But the relative increase of consumptive mortality of late years rests not on the sole evidence of the London bills of mortality. It is confirmed by two instances in the second part of the sixth table, the cases of Holycross and Ackworth. In the instance of Holycross the increase is so great and so rapid, that it is difficult to believe that some mistake has not been committed in the numbers, although the unusual accuracy with which the record of that parish was kept by Mr. Gorsuch during thirty years, is adverse to such a supposition. If it be correct, it proves

that the mortality from consumption was nearly doubled in the space of ten years in a small parish, in which, during that period, very little variation occurred, either in the population, or in the general mortality. In the other instance of Ackworth, the increase, in the space of ten years, amounted to one-eighth; an increase of a very serious nature, if the short space of time included in the observation be considered, as well as the period itself, which was from 1757 to 1767, at which time no great increase had begun to take place in London. The period of vast increase at Holycross was from 1760 to 1770, from which latter year may be dated the augmentation in the London bills.

The second objection which, it was observed, might be stated against the presumption of absolute increase of consumptive mortality from its relative increase at different periods, is grounded on the difficulty of ascertaining whether this increase may not be apparent only, and

arising from a decrease in the general mortality.

If, for example, the inhabitants of this country had, in the year 1700, been six millions, the proportion of mortality one in forty, and the proportion of consumptive mortality one to six, the total deaths would have been 150,000, and those from the disease under consideration 25,000. If in the year 1800 the inhabitants had been the same in number, and the deaths from consumption had been known to have increased relatively one-third, or to be in the ratio of one to four, still might there have been no increase in the absolute fatality of consumption; but a reduction of the general mortality might have taken place in the same proportion, so as to have become as one to sixty; in which case the total mortality would be 100,000, and the consumptive mortality still 25,000*. This

* These, and subsequent statements of a similar nature, may be more readily comprehended by referring to the following calculations, founded on the assumed relations of mortality:—

objection is therefore not without weight, and shews that, in order to establish a relative increase of mortality from any disease to be a just measure of its absolute augmentation, we must ascertain the proportion of deaths to the inhabitants of the country at the particular periods between which a comparison is instituted. As this proportion is not, and cannot be ascertained with precision, we must be satisfied with such an approximation to the truth as can be derived from the imperfect evidence found in those authors, who have treated of that branch of poli-

Population.	Proportion of Mortality to Population.	Total Mortality.	Proportion of the Consumptive to the total Mortality.	Deaths from Consump- tion.
6,000,000	÷ 32 =	187,500	÷ 6 =	31,250
————	÷ 4 =		÷ 4 =	46,875
————	÷ 36 =	166,666	÷ 6 =	27,777
————	÷ 4 =		÷ 4 =	41,666
————	÷ 40 =	150,000	÷ 6 =	25,000
————	÷ 4 =		÷ 4 =	37,500
————	÷ 54 =	111,111	÷ 6 =	18,518
————	÷ 4 =		÷ 4 =	27,777
————	÷ 60 =	100,000	÷ 6 =	16,666
————	÷ 4 =		÷ 4 =	25,000
11,000,000	÷ 40 =	275,000 . .	÷ 5 =	55,000

tical economy, with which this question is connected*.

* Writers on political economy have in vain endeavoured to ascertain with precision the relations of mortality to population in the same country at different periods. The collected information on this subject, recently obtained by the returns to Parliament in answer to the questions proposed in the Population Act, has also proved insufficient to establish with any degree of accuracy the subsisting mortality in this kingdom at the present period; much less to contrast it with the relations which have prevailed at antecedent periods. If the actual return of burials from the abstract of the parochial registers were complete, the annual average of deaths during the last six years of the past century would be found to be, to the population of the kingdom, as one to forty-seven. But these returns are confessedly incomplete from various causes, among which may be mentioned, a total absence of returns from some parishes; known, and reasonably presumed, omissions in those registers from which returns have been made; and a deficiency of any return of burials occurring in places of interment, belonging to different societies of dissenters from the established church. Of the additions, which ought to be made to the sum of recorded burials on account of these deficiencies, there are no data on which a correct estimate can be founded.

This difficulty subsisting in the ascertainment of the absolute number of deaths, Mr. M^r has presumed that the proportion of mortality to the population in this island, at the present time, may be stated as one to forty: the lowest proportion of deaths, he observes, that can we''

Presuming, for the present, that in the year 1700 the mortality in England, in

be supposed in the circumstances of the country, and, if true, indicating an astonishing superiority in healthiness over the generality of other states. In adopting the ratio thus assumed by Mr. Malthus upon grounds confessedly imperfect, less scruple may be entertained from the probability that, if it be erroneous, it deviates from the truth by supposing the proportion of deaths to be less than it really is; and consequently, by employing it as a measure of comparison, there is no danger of drawing exaggerated inferences in relation to the absolute mortality arising from particular diseases. If, however, the assumption be just, it confirms the persuasion, prevailing among medical inquirers, of a progressive decrease of the fatality of disease in general; a decrease, which may be attributed in great measure to improved habits of the people in respect to cleanliness, to the adoption of measures during some years past to prevent the diffusion of contagious febrile diseases, and in some small degree, it may be hoped, to the gradual improvement of the healing art.

The influence which preventive medicine may have on the population of a country, is at present strongly illustrated by the effects of the introduction of vaccine inoculation. It cannot be doubted that this practice has, since its introduction, considerably diminished the annual mortality. It must not however be supposed that this diminution is in the same ratio with the decrease of deaths from small pox, since that were to presume that the vaccinated children were exempted from death by the agency of any other disease. Mr. Malthus has stated his belief,

proportion to its inhabitants, was one to thirty-six; and that the relative increase

that, if the introduction of the cow-pock should effect the extirpation of the small-pox, a perceptible difference will be found in the increase of mortality from some other diseases, supposing the proportion of marriages to remain undiminished. The statement of this belief, which is unavoidable, seems to have been strangely misconstrued into an objection to the practice of vaccination. The principles of that author, and the reasonings founded upon them, forbid such an inference, even if it stood not in contradiction to the direct avowal of his inclination to believe, "that the gradual light which may be expected on the interesting topic of human inquiry in which he has engaged, will teach us to derive from the extinction of a mortal disorder a real blessing, a real improvement in the health and happiness of mankind."

The political economist, who adopts the principles of Mr. Malthus, could he direct at will the population of his country, would adjust the balance between the supply of inhabitants and the means of subsistence, by the operation of the preventive rather than the positive checks to superabundant population. It would consequently be his aim to prevent premature mortality, and his endeavour to preserve, by every means, the lives of those in existence, whether as already contributing by their exertions to the common support, or as advancing to the period when they would become qualified to sustain their share of active employment. He would estimate the death of every individual prematurely cut off, as a loss to the state, in the

of consumptive mortality has, in the course of the century, amounted to one-

proportion in which, according to his age, the expense of his maintenance had already exceeded the amount of his productive labour. Such an economist would be a most strenuous advocate for the application and extension of preventive medicine. He would deprive small-pox of its victims by encouraging vaccination: he would oppose the ravages of contagious fevers, by instituting houses of reception: and he would check the influence of disease in general by promoting habits of cleanliness and sobriety. If, by this preservation of life, his population increased beyond his means of subsistence, he would employ his preventive check to obviate a redundancy, and by diminishing the number of marriages, he would adjust the supply of births to the real wants of his society. That by so doing he would greatly increase the productive labour, and augment the power of his people, in proportion to their numbers, will not be denied; but that he would increase the sum of happiness in his community may, perhaps, be doubted. Would he not necessarily condemn a large proportion of his people to celibacy, and upon the remainder accumulate the difficulties, the cares, and the anxieties, inevitably attendant on the support and education of numerous families?

The effects which have now been hypothetically attributed to the interference of the politician, will, in the present state of things, be produced by the operation of natural causes. A general decrease of deaths, whether it be effected by entirely closing one of the great sluices, or

third, or is become as four to six, it follows that there must have been an absolute

by narrowing all the channels, of mortality, must be productive of a reduction in the number of marriages, and, consequently, of births. Whether such consequences would be in themselves salutary, or conducive to the augmentation of the sum of human happiness, is an inquiry beset with too many difficulties, and involving too many abstruse considerations, to be entered upon here. This, at least, we can perceive, that the provision for the multiplication of life prevails over the provision for its preservation; and hence we may safely conclude, that the ultimate tendency of this is beneficial. It is sufficient for us to know, that the preservation of life is a duty incumbent on man; that the means of effecting it, to a certain extent, are placed within his reach; and that experience has shewn that those means have not been ineffectually employed.

The decrease of mortality, which has been presumed, and partly proved, to have taken place of late years in this kingdom, is probably owing, in great measure, to the preservation of infant life, which the introduction of vaccination has a tendency to augment in a much greater ratio, than any of the various causes, by the combination of which it has hitherto been effected. But the diminution of mortality in general, and of early mortality in particular, inevitably tends to increase celibacy. Augmenting the probability of a large family, gives force to the influence of the preventive check to marriage. This probability has been increased in the higher and middle ranks of life since the introduction of variolous inocula-

increase to a certain extent, unless in the same period the proportion of mortality to population has become as 1 to 54. But this supposition is too extravagant to require refutation. It is sufficient to observe, that an uncommon degree of healthiness is attributed to this island, when it is admitted, that the mortality at present may perhaps amount only to 1 in 40. Admitting, however, with a late author, that the last-mentioned proportion is just, let us inquire what the proportion must have been in the year 1700, to account for the difference of the relative mortality of consumption, upon the supposition of there being no absolute in-

tion, and of various improvements in the treatment of children in early infancy. On these classes of society it may be presumed to have exerted its influence insensibly, in conjunction with other and more powerful causes. If the fatality of small-pox should be annihilated by the universality of vaccination, the probability of more numerous families will extend also to the lower orders; and on them it must be expected to have a similar effect. But its influence here will be counteracted by the happy want of foresight in some, and, in others, by the consideration of the encouragements to marriage, which it is the tendency of almost all our charitable institutions to propose.

crease. In that case we shall be constrained to state the general mortality in 1700 to have been 1 in 27 nearly, which implies a degree of unhealthiness inconsistent with the known condition of the country at that period. It is obvious, that no such proportion of deaths, as has been stated in these two instances, could have happened without such a corresponding augmentation in the population of the country, as is known not to have occurred, and is altogether extravagant to suppose.

From the foregoing considerations it seems to be clearly established, that the apprehension of the increase of consumption is not vain and unfounded. The degree of that increase will probably be estimated differently by different calculators; but will not, by any mode of calculation, be shown to be inconsiderable. Without pretending to offer the following comparative statements as conclusive, I venture to propose them as probable approximations to the truth.

Suppose the inhabitants of England to have been, at the commencement of the seventeenth century, six millions, the annual mortality one in thirty-six, and the consumptive to the general mortality one to six. In this case, the total number of deaths from consumption must have been 27,777. Suppose at the close of the century the inhabitants to be the same in number, the consumptive mortality to have increased to the proportion of one to four, and the annual mortality to have sunk to one in forty. In this case it is evident, that the absolute increase of deaths from consumption will be less than its apparent relative increase of one third, in the same proportion as the total mortality has decreased, which is by one ninth; in other words, the absolute number of deaths from consumption in this case will be 37,500, instead of 41,666, the number to which they would have amounted if the proportion of general mortality had remained unchanged; and the absolute increase will be equal only to somewhat more than one-fourth.

If it should be thought that sufficient difference has not been allowed for the increased healthiness of the kingdom at the end of the century, under the known circumstances of its increased population, let us suppose, that in the year 1700 the annual mortality was so great as one in thirty-two, in which case the consumptive mortality would have been equal to 31,250; and consequently the increase in the century would have amounted only to the difference between that number and 37,500, that is to 6250; and the absolute increase, instead of being one-third, would have been one-sixth. Yet if this should be deemed a juster measure of increase for the whole century than the preceding, still it cannot be considered as a just measure of the increase for the last thirty years; during which period, whether we refer to London, or to the country, we find reason to believe, that the consumptive mortality has increased in a much more rapid ratio than it had in the preceding part of the century.

In these hypothetical statements the population has been supposed to be stationary, because no alteration in it does in any manner affect the argument; but when the increase of consumptive mortality is admitted, the augmentation of the population can no longer be disregarded in estimating the magnitude of the evil.

From an examination of the two parts of the sixth table it appears, that during the last half century the proportion of consumptive to general mortality has been as 1 to 4.2. But as the consumptive mortality may be comparatively less in the country than in towns, from which the grounds of the calculation have been chiefly derived, to avoid exaggeration, let the proportion for the kingdom at large be stated to be as 1 to 5. If this be admitted as just, and if it be granted that the annual mortality is to the population as 1 to 40, while it is ascertained that the inhabitants of Great Britain amount to eleven millions, it will be found that the

ANNUAL VICTIMS TO CONSUMPTION IN THIS ISLAND are not less than FIFTY-FIVE THOUSAND PERSONS.

If the period of life, at which these victims perish, be considered, the loss in a political point of view will assume additional importance. The popular notion of consumption, as one of the ministers of fate, is chiefly drawn from its effects in the superior and conspicuous ranks of society, where it more frequently commences its attack at an early and interesting period of life. From the numerous instances of this kind, which real life daily presents to our view, and fiction continually employs to heighten the scenes of imaginary distress, we are led to confine in idea the influence of this disease to an earlier and shorter period of life, than that to which it is in reality extended; and consequently to consider it as peculiarly destructive to those beings, by whom the relations have not yet been formed, which, connecting the individual with the community, combine in

their dissolution the public with the private loss. But if from these scenes of conspicuous woe, we turn to the humble walks of private affliction, in the lower and laborious classes of society, in the great mass and strength of the people, we shall find it prevailing at a more advanced age, at a period at which the preservation of existence, politically considered, is an object of peculiar value. It assails the labourer and the mechanic in the prime of life; not an insulated, unconnected, individual, but the father of a family, which he leaves helpless and indigent, a burden on the public to maintain. Nor is this protracted influence less extended to the females in the same rank of life. The sufferings they frequently sustain in becoming the mothers of a numerous offspring, too frequently call into action the latent seeds of the disease; and from the circumstance which renders the continuance of their life of increased importance, is traced the source of their untimely death.

From statements of Dr. Haygarth and Dr. Aikin it appears, that one half of those who died of consumption in two years at Chester, had passed their thirtieth year; and at Warrington, three eighths had passed their forty-fifth year. At our dispensary, the number of those who have died beyond thirty exceeds the number of those who died before the attainment of that age, in the proportion of two to one*. The period between thirty and forty seems to be most fatal, the deaths within

* Deaths from Consumption,

	At Chester.	At Plymouth.
Under 5 years of age	14	3
Between 5 years and 10	4	2
10 — 15	7	5
15 — 20	15	6
20 — 30	27	10
30 — 40	24	26
40 — 50	22	13
50 — 60	16	10
Above 60	6	—
Total	135	75

	At Warrington.
Under 14	24
Between 14 — 45	36
Above 45	36

that term being equal to all those occurring before thirty, and rather greater than those happening after forty.

The importance of determining the interesting question, whether consumption be an increasing disease, may justify the length to which the pursuit of the inquiry has been extended. If the increase of consumptive complaints be established as an incontrovertible fact, if this increase has already proceeded to the extent which has been rendered probable, and is still advancing with accelerating rapidity, the promulgation of it must surely add energy to the warning voice, which has loudly demanded; without having sufficiently awakened, the attention of the guardians of the rising generation to the danger which threatens it. If it be established as a fact, let us not vainly hope to find an antidote to its ravages in the hidden stores of nature; but let us rather strenuously seek to ascertain the causes of its extended influence; and endeavour, by all the arts of prevention, to obviate

the attack of a foe, which prudence may assist us to avert, but no prowess will enable us to overcome*.

* It is no part of the design of this tract to enter into the investigation of the causes here alluded to. Its aim is simply to excite such an inquiry by others, possessing a wider field of observation, and to be a preliminary step towards it. The inquiry, indeed, will be unnecessary, if the preliminary fact be not established; and, if it be not, it must be owing either to a fallacy in the sources whence the premises are drawn, to errors in conducting the calculations, or to inconclusive reasonings from them. But if from the above statements, as they now are, or as they may hereafter stand corrected by just criticism, the conclusion be verified, the future inquirer will at least not be stopped *in limine*, as the author of a late inquiry into the changes in the climate of Great Britain, by a denial that any change had occurred.

In speaking of the chance of curing consumption, it is far from my intention to depreciate the merits, or abate the zeal of those, by whom new methods of trial are recommended; but only to state the smallness of the chance, for the purpose of quickening attention to the necessity of early recourse to prevention. In attempts to cure the disease, when formed, we generally have the earnestly concurrent assistance of the patient and his friends. In applying the means of prevention, have we not, too often, the concurrent counteragency of both these parties? The alliance, which at first might have been decisive, is withheld, until it is at best fruitless and unavailing.

Having thus deduced from the evidence contained in the sixth table, the extension of phthisical disease in general, our attention is recalled to the more immediate object of inquiry; its relative influence in this place, compared with other places mentioned in the table, especially those in the second part.

If the average of consumptive mortality at Plymouth be compared with the general average deduced from the same source in all the places cited in the second part of the table, collectively taken, it will be found to differ only in the small proportion of one seventeenth, the relation of the former to the latter being as 4.28 to 4. If London and Bristol be excluded, it will somewhat exceed the average of the remaining places, the relation in that case being as 4.28 to 4.36. But that the difference in the latter instance would have been reversed, and in the former considerably augmented, if the comparisons had been instituted from data derived from identical

periods, is a conclusion warranted by the preceding remarks in proof of the progressive increase of the malady under consideration. For it cannot have escaped observation, that, while the average of mortality from the other places is drawn from documents which do not extend beyond the year 1773, and are included within that and the year 1747, the average of Plymouth is derived from a period so much more recent, that the far greater part of it extends into the present century. But if the average of Plymouth be contrasted with those averages, which are deduced from periods nearly correspondent in time, of which we have instances only in Bristol and London, it will be found that the phthisical mortality at Plymouth has of late years been nearly one fourth less than in London*, and less by nearly one half than in Bristol*.

In the unsettled state in which Europe has for some time been, and in which she

* Tab. VI. P. II.

is probably destined long to continue; while in some countries the genial influence of climate is denied by open hostility, and in others neutrality is no longer permitted to afford a sanctuary even to the votaries of health; it has become an object of increased importance to determine, what places in our own island are best adapted to the residence of those, who are assailed by the “*giant malady of the country.*”

The mildness of the winter season in the south-west of England has of late years induced consumptive invalids to seek refuge in Devon and Cornwall. It would certainly be an object of curiosity and of utility to ascertain the frequency and mortality of indigenious consumption in these counties, relatively to other districts in the eastern, northern, and midland parts of the island. Unfortunately for this inquiry, most of the calculations we possess, are derived from registers kept in large towns, and consequently liable to be influenced by various local

causes. On account of this influence it has been suggested, that the number of cases of consumption occurring at Plymouth may not afford a just criterion for estimating the relative frequency of the disease in the western part of the island; because the occupations and habits of many of the inhabitants of this town are conceived to be peculiarly favourable to the production of the disorder*. Various employments in a sea-port necessarily expose a large proportion of the labouring class to the severities and vicissitudes of weather; and under such circumstances the inducement to a more free use of spirituous liquors, will be aided by a greater facility of obtaining them. Of this argument it may be deemed no trifling confirmation, that the proportion of males to females, whose deaths from consumption

* This objection was suggested by a physician of this place, who, in the course of his extensive practice, has had frequent opportunities of observing the greater prevalence of consumptive complaints in the little towns and villages on the seaside near Plymouth, than in the country at large. This he ascribes to the combined operation of the causes assigned.

are recorded in the first table, exceeds three to two; a proportion the reverse of that which might have been expected, if the greater exposure of men in sea-faring occupations had not been adverted to*.

It may also be objected to the application of a proportion derived from the phthisical mortality of a Dispensary only, to the district containing that institution; that consumption may be presumed to be more prevalent among that class which applies to such charities for relief, than among the middle and higher ranks; and consequently, that the relative mortality will be greater in that portion, than in the aggregate of the inhabitants of the district. Consonantly to this supposition

* This presumption of the greater liability of the female sex in general is not, it must be confessed, warranted by the only other instance in point, which has occurred to me. In this the proportion of males exceeds that of females, although in a far less degree than in the instance above-mentioned. At Ackworth, in Yorkshire, there died of consumption, from 1747 to 1767, thirty-three males and twenty-eight females, which is in the proportion of 8.25 to 7.

it will be observed in the sixth table, that the proportionate mortality, stated from Dr. Willan's general practice, exceeds that deduced from the bills of mortality; which could not have happened, if Dr. Willan's statement had not been materially influenced by the description of his patients, a large proportion of whom, notwithstanding the known extent of his private practice, must have been derived from the Carey-street Dispensary.

In considering the effect of these objections in the instances cited in the table, we shall find, that the latter alone, and that partially, applies to Dr. Willan's statement; and that the former is applicable to Bristol and London, (where the combined operation of exposure and intemperance must assuredly be experienced in full as great a degree as at Plymouth) and not to Shrewsbury and Chester. If therefore, the mortality at Plymouth be contrasted with that at Chester or Shrewsbury, an allowance must be made for the local reasons assigned in each of the objec-

tions; but if the comparison be made with Bristol or London, such a correction only is necessary as may be warranted by the second objection. Upon the whole it appears not improbable, that more accurate and comprehensive statements might confirm the opinion entertained of the comparatively favourable influence of the climate of the west of England on consumptive complaints.

One observation more respecting this disease shall suffice. In the first table, the whole number of cases of phthisis is stated to be 198, and of deaths 75; and accordingly in the fourth table, the proportion of mortality is said to be as 1 in 2.61. But from this statement it must not be inferred, that the recoveries have been in this proportion. The practice at our institution lays not a claim to such success. This disagreement will be explained by recollecting, that in the course of seven years the same persons may have been admitted at different times, labouring under the same disease, and at each

time of admission may have been considered as distinct persons. Some also having been relieved, and discharged for the purpose of going into the country for change of air, may have there died unrecorded. Others, wearied with a long attendance, desire to be discharged, and resigning themselves to their fate, sink at last unnoticed into the grave. What allowances are to be made on these accounts cannot be easily estimated. In early stages of the complaint some benefit is doubtless derived from preventive medicine, in removing the disease, or in deferring the period of its fatal attack; and certainly some rare instances do, from time to time, occur of recoveries under circumstances apparently most unpromising. By the recollection of these our hopes are animated, and our feelings reconciled to the task of attending the victims of this disease, the most painful office of a painful profession.

The disease, which from its importance claims the next attention, is FEVER, the

prevalence of which in this town is, as has been already hinted, less extensive than might have been expected from the consideration of its populousness, its liability during war to an excessive increase of its inhabitants, and to its exposure to contagion from its intercourse with fleets and armies.

The proportion of typhus to other diseases at our Dispensary, on an average of seven years, is as 1 to 20.2. At the Dispensary in Liverpool, we find from the tables given by Dr. Currie*, that the proportion of typhus to other diseases was, on an average of seventeen years, as 1 to 4.5 nearly. In that period the number of general cases admitted at the Dispensary amounted to 213,305, of which 48,367 were cases of typhus. In the space of seven years the number of general cases admitted at our Dispensary has been 4409, of which 218 have been cases of typhus.

* Currie's Medical Reports, &c. 230, 2d. edit.

But before a comparison can be instituted on these data, some circumstances must be taken into consideration, which may materially influence the result. In the first place, the disproportion will be made much more considerable by deducting from the general cases, admitted at Liverpool, one sixth part*, as the probable proportion of surgical cases, which are not admitted in these tables. But, on the other hand, it is probable, that this difference would be counteracted by the addition of all the medical cases admitted in the same period into the infirmary at Liverpool. And as cases of fever are not admitted into this infirmary, and as Plymouth has no such institution, it is obvious that this addition must be made, before we can institute a fair comparison between the proportions of fever to other diseases, to which the same class of people in the respective towns is liable; the

* In assuming the surgical cases to be one sixth of the whole, the proportion is adopted, which actually subsists in a return for September, 1790, stated in page 225 of the work above cited.

care of the general diseases being in the one instance divided between two establishments, and the care of the particular disease being restricted to one of them, while in the other instance, one establishment includes the admission of the particular as well as the general diseases. This necessary correction cannot be made, owing to the number of admissions into the Liverpool Infirmary being unknown. A correction is also required, on the other hand, in the Plymouth statement, since the proportion ought to be increased by deducting from the general cases all those which have occurred in persons not residing within the town; as it is obvious from the nature of the Institution, that no cases of fever occurring in persons of this description can have been admitted. Still, however, after making these contrary allowances, there will probably be no great error in presuming the prevalence of fever to be more extensive among the lower class of inhabitants of Liverpool, than it is among those of the same de-

scription in Plymouth, in the proportion of four to one.

This amazing difference must, however, without hesitation, be ascribed in a much greater degree, to causes rendering Liverpool peculiarly obnoxious to the influence of fever, than to causes operating to render Plymouth peculiarly unobnoxious to similar influence. Of this, little doubt can be entertained, when it is known, that of the inhabitants of Liverpool “seven thousand live in cellars under ground, and nearly nine thousand in back houses, which in general have an imperfect ventilation, especially in the new streets on the south side of the town, where a pernicious practice has been lately introduced of building houses to be let to labourers, in small confined courts, which have a communication with the street by a narrow aperture, but no passage for the air through them. Among the inhabitants of these cellars

and back houses typhus is constantly present*.”

The proportion of fever cases at Plymouth approaches nearer to that which appears to obtain in London. From an average of Dr. Willan's practice, during four years, it appears that the cases of fever were to the general cases as 1 to 16, the total number of the former being 11,484, of the latter 731†. Here, however, it must be observed, that Dr. Willan's cases included not only those admitted at the Carey-street Dispensary, but also those occurring in his own very extensive private practice among the middle and higher classes of society; and as the

* Currie's Reports, &c. 222, 2d. edit.

† See Reports on the Diseases in London.—It is here necessary to observe, that, in estimating the number of fever cases, in Dr. Willan's Monthly Reports, I include not only what he styles contagious fever, but his synochus and slow fever, because I apprehend the term typhus, in the other instances, to have been employed in the extensive sense in which it was applied by Cullen, and, consequently, to have embraced all those cases.

prevalence of fever in those classes is comparatively very inconsiderable, we are probably entitled to deduct such a number from the general cases, as will render the proportion of fever to the remainder as 1 to 13, or even 12. It must, at the same time, be remembered, that a contrary correction must be made, as in the case of Liverpool, on account of the London hospitals, from which fever is also excluded.

In Dr. Clarke's relation of the recent proceedings at Newcastle, for the establishment of a house of recovery*, there are many facts relative to the prevalence of fever, in that and some other towns; but there are not sufficient data for instituting a comparison, even on the grounds assumed in the preceding instances. In one place†, he speaks of the

* Collection of Papers intended to promote an Institution for the Cure and Prevention of infectious Fevers in Newcastle, &c. By John Clarke, M. D.

† Part I. p. 19, note.

number of cases of fever in one year having amounted to 425 ; in another*, he gives the number of cases admitted at the dispensary in four successive years, the average of which is 156. But as he does not state the total number of cases admitted in the same period, the relation of one to the other cannot be obtained. We may, however, arrive at a conclusion by another process, namely, by finding the proportion of fever cases to the number of inhabitants. The number of fever cases admitted at the Newcastle Dispensary, assuming 156 as the average, is to the population of that town, estimated at 36,000, as 1 to 231. And if the number of general cases admitted at the Newcastle Dispensary be to the inhabitants at large in the same relation as the corresponding number is at Plymouth, namely, as 1 to 24, then it will follow, that the proportion of cases of fever, at the former place, is as 1 to 10,

* Part I. p. 56.

Upon the whole, from these premises, which must be allowed to be but imperfect, we shall perhaps approximate the truth in supposing the relative occurrence of fever to other disorders, among the lower class of inhabitants, to be in Liverpool as 1 to 5; in Newcastle, as 1 to 10; in London, as 1 to 13; and in Plymouth, as 1 to 18. This calculation will appear less objectionable, when it is recollected, that the best evidence in its support subsists in the two instances, which form the extremes.

Few remarks remain to be made on the other diseases included in the first table.

The decrease of INTERMITTENT FEVER in this district is sufficiently obvious, by contrasting its rare appearance at present with the frequent mention of it in the writings of Dr. Huxham. Yet, from an observation of that author*, connected

* Ex quo sanè tam udas habuimus tempestates, febres intermittentes omnigenæ per has regiones grassatæ sunt

with subsequent experience, it should seem that the prevalence of intermittents in this place, at the period when he wrote, was owing to accidental circumstances; and that the present, as well as previous, exemption from this disorder is to be ascribed to local and original causes, and not to the operation of those general causes, connected with the agricultural improvement of the country, by which its influence in this island has been confined to very narrow limits.

Dr. Heberden remarks that there is scarcely any fact to be collected from the bills of mortality more worthy of attention than the gradual decline of DYSENTERY. In the seventeenth century, the number of deaths under this head appears

maximè, etiam in hoc oppido et per viciniam; cum tamen annis ab hinc viginti veras intermittentes rarissimè viderim. Imò bene memini milites plurimos, emeritos, ad arcem nostram olim transvectos ab oris Icenis et Portu maguo, pertinaci admodum quartanâ tantùm non confectos penitus, qui tamen hic, a sola benignitate cœli, convaluere protinus.
—Huxham de Aere, An. 1735, p. 117.

to have been never less than one thousand, and sometimes to have exceeded four thousand. In the eighteenth century, the decline was constant, regular, and rapid; the average number of cases, in the first ten years, amounting to one thousand and seventy, and in the last ten years only to twenty. Yet, from the year 1733, colic has been included under the same head with dysentery. Our tables confirm the infrequency of these diseases. Dysentery is almost unknown; and the decrease of COLIC in this town, during the last thirty or forty years, has been, I have reason to think, very remarkable. Its relative occurrence is as 1 to 133, and its proportional mortality as 1 to 321. Of dysentery no fatal case has occurred.

The increase of APOPLEXY and PALSY, Dr. Heberden observes, has been gradual and constant. The proportional mortality from these diseases is now more than double what it was a hundred years ago. On the average of the last five years of the last century it appears, from the

bills, to have been as 1 to 50. Our table confirms the observation, as far as relates to the present times, by giving the relative mortality as 1 to 32.

DROPSY is one of the diseases, which appears to be rather on the decline in the southern part of the island. This seems to have been in great measure effected by the operation of the duties imposed on distilled spirits. The proportional mortality from this disease, as deduced from an average of the last three years of the eighteenth century, in the bills, corresponds, very nearly, with that afforded by our table, being in the one instance as 1 to 20.8, in the other, as 1 to 19. The proportion of cases of dropsy to the general cases is as 1 to 36. I am inclined to believe this proportion much less than obtains in the northern part of the island, where the use of whiskey seems still to retain a predominating influence on disease. Has this species of distilled spirits a peculiarly destructive influence? In certain districts of a neighbouring county,

where brandy is supposed to have been drunk with a liberality proportionate to the facility with which it was *once* obtained, I have been assured by a gentleman of accurate observation, whose opportunity of forming an opinion had been long and extensive, that dropsy did not particularly prevail. Yet the free use of spirituous liquors, as a frequent cause of dropsy, rests on evidence too strong to be questioned.

DIABETES, I am led to believe from my inquiries, has been in this neighbourhood a disease of rare occurrence. Our table gives only two instances; and neither of these furnished a well-marked case of the disease. It has been supposed to be more frequent in Scotland than in England; yet in a place where diseases of curiosity are sought after with avidity, and where in diseases little understood relief would be sought from distant parts, twenty cases only occurred to Dr. Cullen, in his long practice. And in the same situation thirteen years afforded only

twelve instances to Dr. Gregory, and twenty years the same number to Dr. Duncan.

At the conclusion of the first table is stated the total number of cases treated at the Dispensary in the first seven years of its existence, together with the TOTAL NUMBER OF FATAL EVENTS arising out of those cases in the same period. If a comparison of these numbers had afforded any presumption of more than usual success, I should silently have participated in the gratification resulting from the reflection, that the liberality of the public had produced a more than wanted share of benefit to the objects of its compassion. But feelings of a different tendency cannot influence me to forbear contrasting the real mortality, as it fairly and simply stands, in our Institution, with that which obtains in other establishments of a corresponding, or nearly similar nature. From the great difference in the proportional mortality at different institutions, as stated in the subjoined

table, it will probably be inferred, that no great confidence can be placed in any comparisons on this head, unless the nature and mode of conducting the respective establishments were better known. A source of material difference arises from the admission, or exclusion of surgical cases, the proportion of deaths from the latter being always much smaller than from the former. The mortality also, on several accounts, may be presumed to be greater at dispensaries than in hospitals. In the former, diseases of all descriptions, and at all periods, are admitted; while from the latter, contagious distempers, as fever and small pox, in most instances, and *consumption in many*, are excluded: and how large the proportion of fatality from these sources is, needs not to be recapitulated.

How inferior the chance of success in dispensary to that in hospital practice is, will be obvious to him who reflects on the situation of the diseased poor man in his miserable habitation, often without

necessaries and without attendance, or with these, when supplied, most injudiciously employed, and contrasts it with the condition of the same person transferred to a ward of a British hospital.

It may perhaps be said, that a large portion of cases admitted at a dispensary are of a slighter nature, and such as would not be sent to an hospital; and therefore, that the mortality should be proportionably less. This observation is certainly just, but it is applicable only to those hospitals where out-patients are not received. But it will not escape remark, that in the following table the greatest differences subsist in the reports from dispensaries; and this difference appears to be totally irreconcilable in the first two instances, where a more than common correspondence might have been presumed to obtain. It is equally impossible to reconcile the report of the Carey-street Dispensary, under Dr. Wilan's direction, with the result of that

physician's general practice, as well public as private.

That the total proportion of deaths in our dispensary is large, I am still inclined to believe from perceiving the proportion to be unexpectedly large in two or three prevailing disorders. In typhus the loss has been one in six; whereas in the Newcastle Dispensary, and in the Edinburgh Infirmary, the loss is one in fifteen, and in the Whitehaven Dispensary one in twenty. In pneumonia the proportion of deaths with us is also one in six. In the first instance, the difference may partly arise from a diversity in the application of the term typhus. Perhaps many of the cases included in our table under the title febris might have been classed as slighter cases of typhus; and had this been done, the apparent mortality would have been much less. An observation, common to fever and pneumonia, but more decidedly applicable to the latter, is, that admission is too generally deferred to a very late period of the disease. Of

the hundred and thirty eight cases of pneumonia, I suspect there was no opportunity of employing the lancet in a fifth part. The list of deaths is swelled also by the fatal effects of small pox, of the cases of which one half has proved mortal. If delay in applying for assistance be observable in the two last-mentioned diseases, it is still more remarkable in this; but I am far from thinking that a difference in the event would so certainly follow a contrary practice in the latter instance as in the former. But whatever the influence of this cause may be, it is difficult to conceive its operation confined to our institution, unless indeed the novelty of the establishment may be supposed to involve such a consequence.

TABLE VII.

AVERAGE OF DEATHS

AT

SEVERAL INSTITUTIONS.

TABLE VII

AVERAGE OF DEATHS

SEVERAL INSTITUTIONS

TABLE VII.

Institutions.	Period of average.	Proportion.
DISPENSARIES.		
1 Carey-street, Westminster	15 years	1 in 63.2
2 Surry, Southwark	12 years	1 — 35.5
3 Dispensary, not named	June to Dec. 1798	1 — 27.5
4 Dr. Willan's practice } London, in private	2 years	1 — 20.6
5 Plymouth, exclusive of cases of surgery	7 years	1 — 18
INFIRMARIES.		
6 Woolwich, Royal Artillery	5 years	1 — 35
7 Exeter, (both in and out patients)	60 years	1 — 34
6 Northampton, (new)		1 — 31

Institutions.	Period of average.	Proportion.
6 Leeds, (in-patients)	1 year	1 — 28
8 Chester	18 years	1 — 25
6 Newcastle, (Dr. Clarke's practice)	3 years	1 — 23
6 Glasgow		1 — 21
26 Northampton, (old)		1 — 19
6 Worcester		1 — 19
6 Newcastle	2 years	1 — 16
6 Newcastle, (including cases of surgery)	1 year	1 — 14.5
6 Newcastle, (excluding cases of surgery)	1 year	1 — 14
6 London hospitals		1 — 13
6 Salop		1 — 11
9 Hotel Dieu, Paris	3 years	1 — 5

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NOTES ON TABLE VII.

- ¹ From a statement of the charity to March, 1798. The number of patients admitted and discharged is 24,918, of which 394 are deaths. In this statement medical and surgical cases are included, which must be understood to be implied in other instances, when the contrary is not specified.
- ² From a statement of the charity to March, 1790. The number of patients admitted and discharged, exclusive of midwifery cases, is 40,509, of which 1140 are deaths.
- ³ Cited in Paley's Christian Theology.
- ⁴ Reports on the Diseases in London, pp. 161, 171, 84.
Table V.
- Clarke's Collection of Papers, intended to promote an Institution for the Cure and Prevention of Fevers in Newcastle. Part I. p. 216, & *passim*.
- ⁶ The proportion of deaths in this infirmary is stated to have been 14 in Clarke's Collection, p. 216, and 19 in two other parts of the same work.
- ⁷ Annual statement.
- ⁸ Haygarth, Phil. Trans. vol. 74, p. 71.
- ⁹ Police of France, p. 83. Price, Vol. I. p. 290.

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PART II.

TABLES

ILLUSTRATIVE

OF THE

INFLUENCE OF THE SEASONS

ON

MORTALITY,

WITH OBSERVATIONS.

In the following tables, the number affixed to each month is the aggregate amount of the deaths in that month of all the years of the stated period.

In the second division of each table the succession of the months is arranged in relation to the increase of deaths in each of them.

The second number affixed to February denotes the amount of the deaths, upon the supposition of the assignment of thirty-one days to that month.

PART II.

TABLES

ILLUSTRATIVE

OF THE

INFLUENCE OF THE SEASONS

ON

MORTALITY

WITH OBSERVATIONS.

In the following tables, the number allied to each month is the aggregate amount of the deaths in that month of all the years of the period.
In the second column of each table the number of the deaths is arranged in relation to the amount of days in each of them.
The second number allied to the first column is the number of the days upon the expiration of the duration of thirty-one days in the month.

TABLE VIII.

*BLANDFORD.

40 Years—1733 to 1772.

Summer	{ June	{ 190	} 480	}	991
	{ July	{ 146			
	{ August	{ 144			
Autumn	{ September	{ 165	} 511	}	2231
	{ October	{ 172			
	{ November	{ 174			
Winter	{ December	{ 168	} 606	}	1240
	{ January	{ 220			
	{ February	{ 218			
Spring	{ March	{ 223	} 634	}	
	{ April	{ 193			
	{ May	{ 218			

August	144	
July	146	
September	165	
December	168	
October	172	
November	174	
June	190	
April	193	
May	218	
February	218	— 236
January	220	
March	223	

* Phil. Trans. The deaths from small-pox, of which a separate account is given, are not included in this table.

TABLE IX.

*CHESTER.

2 Years—1772, 1773.

Summer	{ June	} 61	} 138	} 304	} 731		
	{ July	} 38					
	{ August	} 39					
Autumn	{ September	} 37	} 166			} 7 to 5:	}
	{ October	} 56					
	{ November	} 73					
Winter	{ December	} 82	} 232				
	{ January	} 69					
	{ February	} 81					
Spring	{ March	} 65	} 195	}	}		
	{ April	} 67					
	{ May	} 63					
							427

September	37
July	38
August	39
October	56
June	61
May	63
March	65
April	67
January	69
November	73
February	81 — 87
December	82

TABLE X.

*WARRINGTON.

1 Year.

Summer	{ June	} 22	} 54	} 84	} 262
	{ July	} 16			
	{ August	} 16			
Autumn	{ September	} 13	} 30	} 2 to 1.	}
	{ October	} 11			
	{ November	} 6			
Winter	{ December	} 29	} 94	} 178	}
	{ January	} 35			
	{ February	} 30			
Spring	{ March	} 35	} 84	}	}
	{ April	} 29			
	{ May	} 20			

November	6
October	11
September	13
July	16
August	16
May	20
June	22
April	29
December	29
February	30 — 33
January	35
March	35

* Phil. Trans. vol. 64.

TABLE XI.

PLYMPTON - MAURICE, PLYMPTON SAINT
MARY, PLYMSTOCK, adjoining Country Parishes
in the County of DEVON.

6 Years—1779—1804.

Summer	{ June	} 36	} 91	} 211	
	{ July	} 23			
	{ August	} 32			
Autumn	{ September	} 40	} 120		} 506
	{ October	} 43			
	{ November	} 37			
Winter	{ December	} 39	} 139	} 295	
	{ January	} 48			
	{ February	} 52			
Spring	{ March	} 35	} 156		} 7 to 5.
	{ April	} 64			
	{ May	} 57			

July	23
August	32
March	35
June	36
November	37
December	39
September	40
October	43
January	48
February	52 — 56
May	57
April	64

TABLE XII.

ST. ANDREW, CHARLES; STOKE DAMARELL;
EAST STONEHOUSE; comprising the towns of
PLYMOUTH, PLYMOUTH-DOCK, and STONE-
HOUSE.

6 Years—1799—1804.

Summer	{ June	} 716	} 2059	}	4265
	{ July	} 638			
	{ August	} 705			
Autumn	{ September	} 725	} 2206	}	6 to 5.
	{ October	} 751			
	{ November	} 730			
Winter	{ December	} 820	} 2485	}	5071
	{ January	} 860			
	{ February	} 805			
Spring	{ March	} 899	} 2586	}	9336
	{ April	} 856			
	{ May	} 831			

July	638
August	705
June	716
September	725
November	730
October	751
February	805 — 870
December	820
May	831
April	856
January	860
March	899

TABLE XIII.

*LONDON.

15 Years—1728, 1743.

Summer	{	June	30197	}	89236	}	191382	}	405951
		July	28210						
		August	30829						
Autumn	{	September	33375	}	102146	}	191382	}	405951
		October	34590						
		November	34181						
Winter	{	December	35952	}	109791	}	214569	}	405951
		January	37682						
		February	36157						
Spring	{	March	37126	}	104778	}	214569	}	405951
		April	34242						
		May	33410						

July	28210	
June	30197	
August	30829	
September	33375	
May	33410	
November	34181	
April	34242	
October	34590	
December	35952	
February	36157	— 39062
March	37126	
January	37682	

* Short's Observations, &c.—Heberden, p. 47.

TABLE XIV.

* YORK.

7 Years.

Summer	{ June	} 274	} 731	} 1423	
	{ July	} 220			
	{ August	} 237			
Autumn	{ September	} 225	} 692		} 3175
	{ October	} 237			
	{ November	} 230			
Winter	{ December	} 292	} 894			} 1752
	{ January	} 320			
	{ February	} 282			
Spring	{ March	} 316	} 858	}	
	{ April	} 277			
	{ May	} 263			

July	220
September	225
November	230
August	237
October	237
May	265
June	274
April	277
February	282 — 306
December	292
March	316
January	320

* Heberden, p. 49.

TABLE XV.

* 25 COUNTRY-TOWNS IN ENGLAND.

Many years.

Summer	June	13680	39509	} 80211 } 5 to 4. } 100645 } 180856
	July	13034		
	August	12795		
Autumn	September	12999	40702	
	October	13629		
	November	14074		
Winter	December	15658	48716	
	January	16932		
	February	16126		
Spring	March	17641	51929	
	April	17670		
	May	16618		

August	12795
September	12999
July	13034
October	13629
June	13680
November	14074
December	15658
February	16126 — 17422
May	16618
January	16932
March	17641
April	17670

* Short's Observations, &c.—Heberden, p. 48.

TABLE XVI.

COMPRISING

the aggregate numbers of the eight preceding Tables.

Summer	{	June	45176	} 132298	}	278871
		July	42325			
		August	44797			
Autumn	{	September	47579	} 146573	}	7 to 6.
		October	49489			
		November	49505			
Winter	{	December	53040	} 162957	}	324177
		January	56166			
		February	53751			
Spring	{	March	56340	} 161220	}	603048
		April	53398			
		May	51482			

July	42325	* July	42325
August	44797	August	44797
June	45176	June	46682
September	47579	September	49165
October	49489	October	49489
November	49505	November	51159
May	51482	May	51482
December	53040	December	53040
April	53398	April	55177
February	53751	January	56166
January	56166	March	56340
March	56340	February	58069

* In this column the months are supposed to contain an equal number of days, viz. 31. The calculation has been made by adding to each of the months which consist of 30 days, 1-30th of its number, and by adding to February 3-28ths of its number, after deducting 1-4th on account of leap years.

* The numbers in this table denote the amount of burials registered, not only at the two parish churches, but at all other places of interment within the town. In applying the numbers, however, to any other purpose than that for which it is here introduced, it must always be remembered, that in a place so situated as Plymouth, especially during war, the proportion of burials is liable to considerable variation from accidental sources.

TABLE XVIII.

PROPORTION OF DEATHS IN EACH OF THE
MONTHS OF FIVE YEARS,

as in the preceding table, the months being arranged in
pairs, according to their respective distances
from the middle of summer.

June	} 240	} 441	}	964
July	} 201	} 523		
May	} 276	}	}	1191
August	} 247			
April	} 335	}	}	3367
September	} 259			
March	} 333	}	}	1212
October	} 264			
February	} 319	}	}	624
November	} 269			
January	} 329	}	}	
December	} 295			

TABLE XIX.

PROPORTION OF DEATHS IN EACH MONTH OF SIX YEARS,

From September, 1799, to August, 1805, at the Plymouth Public Dispensary.

	1799	1800	1800	1801	1801	1802	1803	1804	1805	Total of 6 months.
September	4	4	6	3	3	2	2	2	2	21
October	1	3	5	4	4	5	5	2	2	20
November	4	6	3	4	4	7	3	3	6	27
December	2	5	8	5	5	3	6	4	4	29
January	5	4	8	6	6	5	5	4	4	33
February	6	6	6	8	8	5	7	2	4	35
March	3	3	4	5	5	7	2	7	7	24
April	5	1	9	2	2	5	5	4	4	29
May	4	4	2	2	2	3	2	3	3	19
June	2	8	0	0	0	2	2	3	3	15
July	6	3	2	2	1	2	2	3	3	17
August	2	5	1	2	2	3	3	3	3	16
Total	44	52	54	42	50	43	285			

Autumn { 68 }
 Winter { 97 }
 Spring { 72 }
 Summer { 48 }
 Total { 285 }

TABLE XX.

PROPORTION OF DEATHS IN EACH OF THE
MONTHS OF SIX YEARS,

as in the preceding table, the months being arranged in
pairs, according to their respective distances
from the middle of summer.

June	} 15	} 32	}	67
July	} 17	} 35		
May	} 19	}	}	94
August	} 16			
April	} 29	}	}	285
September	} 21			
March	} 24	}	}	124
October	} 20			
February	} 35	}	}	62
November	} 27			
January	} 33	}	}	62
December	} 29			

TABLE XXI.

NUMBER OF PATIENTS ADMITTED AT THE
PLYMOUTH DISPENSARY,

in each month of six years, from September, 1799, to August, 1805, the succession of the months being arranged in the order of their abundance in disease*.

1	August	.	.	.	298
2	July	.	.	.	313
3	June	.	.	.	316
4	April	.	.	.	322
5	October	.	.	.	323
6	December	.	.	.	323
7	September	.	.	.	331
8	November	.	.	.	331
9	May	.	.	.	339
10	February	(371)			344
11	January	.	.	.	347
12	March	.	.	.	363
					<hr/> 3950 <hr/>

* To obviate a possible objection it may be observed, that the facility of admission at this institution is at all times such as to preclude the idea of the admissions being influenced by any other cause than the wants of the applicants.

TABLE XXII.

NUMBER OF PATIENTS ADMITTED AT THE
PLYMOUTH DISPENSARY,

in each month of six years, from September, 1799, to
August, 1805, the months being arranged in their natu-
ral succession, and classed in seasons, as in Table XIX.

Autumn	{	September	{	331	} 985	} 3950		
	{	October	{	323				
	{	November	{	331				
Winter	{	December	{	323	} 1014		} 3950	
	{	January	{	347				
	{	February	{	344				
Spring	{	March	{	363	} 1024			} 3950
	{	April	{	322				
	{	May	{	339				
Summer	{	June	{	316	} 927				} 3950
	{	July	{	313				
	{	August	{	298				

The prevailing opinion in this country of the influence of the seasons on disease and mortality is justly observed by Dr. Heberden to subsist in opposition to the evidence of the clearest facts. Of these facts some are passing in constant and daily review, while others are derived from less obvious, though more conclusive, sources. But the prejudice, which prevails in defiance of the former, receives a very limited correction from the latter; while it acquires continual support by deriving its origin from various sources. The influence of the ever-varying condition of the atmosphere of this island on the animal spirits of its inhabitants, has been conceived to give a colour to opinion in many instances. That in the present instance it should prove a source of erroneous judgment, is little to be wondered at. Those who, to employ their own metaphorical and delusive expressions, feel their bodies *braced*, their nerves *strung* with new vigour, and their spirits *elastic*, will naturally infer, that the sharp air, the keen frost, the serene

sky, to which these effects are ascribed, must be more propitious to health, than the warm, moist, and foggy atmosphere, in which they had previously been oppressed with languor, and enfeebled by *relaxation*. Hence is derived the universal interchange of congratulation on the healthfulness of the weather, when to a mild and open November succeeds the keen frost of January or December.

At a period, happily remote from our times, when England was subject to the frequent visitation of pestilential disease, the approach of summer was dreaded as the harbinger of the plague; and winter was hailed as the deliverer from its ravages. And in our own times we have had such frequent occasions to lament the wide-wasting ravage of disease in the warm climates of the western world, where British valour sinks into an untimely and inglorious grave, that analogy, the fruitful parent of fallacious conclusions, leads us to associate the ideas of warmth and contagious distempers in our

own temperate climate. But the fevers of contagious origin in this island prevail undoubtedly to a greater extent in the winter than in the summer; and the explanation of the fact is found, in part, sufficiently obvious, in the less ventilation of the houses of the poor, in which contagion is generated, in winter than in summer. Sparingly provided with the supplies of artificial heat, they sedulously exclude the entrance of external cold; and preventing as much as is possible the renovation of the air in their rooms, they breathe with little intermission a highly vitiated atmosphere during a considerable length of time.

Perhaps in considering the origin of the popular belief, the force of early impressions and early associations in those classes of society, on whom, on most occasions, depends the cast of public opinion, may be entitled to some attention. In this, as in many other instances, we trace the influence of classic lore. From the poets of Greece and Rome we

imbibe early notions of the beauties of spring. Their enlivening descriptions, true to the feelings of their authors in the genial climes of Italy and Greece, have, with poetic licence, been transferred to our northern skies; and the shivering inhabitant of Britain talks of the approach of spring in the language of Arcadia.

But it is not to poetic description alone, the influence of which is insensibly so extensive, but to the pages of science also, that this illusion is to be traced. From the dictates of Hippocrates and Celsus originated, we may presume, the creed of the physicians of modern Europe on the salubrity of the seasons. “*Saluberrimum ver est;*” (says the elegant physician of Rome) “*proximè deinde ab hoc hiems; periculosior æstas; autumnus longè periculosissimus;*” and in the succession of eighteen centuries this observation has not become less applicable to the country in which it was originally made. In modern times the records of Marseilles and Montpellier, which may be cited in defect of

evidence immediately derived from Italy, correspond very nearly with this description of the year. At the latter place, the mortality from June to November exceeds that from December to May nearly in the proportion of four to three. At Marseilles, the difference is on the same side, but not in the same degree.

The strongly contrasted winters of 1795 and 1796 will, in all probability, be adduced in future, as irrefragably refuting the opinions, which in this island attribute unhealthiness to a mild, and healthiness to a severe winter. But, although this instance will justly be appealed to, as placing the fact in a striking point of view, yet the admission of the general position cannot reasonably be expected, without the production of evidence in its support on a much more extended scale. Of this nature is the proof adduced by Dr. Heberden from the London bills of mortality, supported by the concurrence of similar conclusions deduced from registers in some other towns in England.

The principle also, on which the conclusion is founded, receives confirmation from records at Paris and throughout the kingdom of Sweden.

In the preceding tables (from VIII. to XXII.) is collected and arranged various evidence on the question, as far as it relates to this kingdom, derived from the recorded mortality at different periods and at different places; and particularly, in conformity with my design of illustrating relative local mortality, in this town and its vicinity.

In the division of the year into four seasons, the boundaries have neither been assigned with precision by nature, nor definitely prescribed by custom. In the distribution of the months into the respective seasons adopted in these tables, no arrangement more correspondent to nature seemed practicable, while an equal portion of time is to be allotted to each season. The protracted arrival of summer for many years past justifies the as-

signment of its commencement to the month of June, and the mild, open, and unclouded days of many a November should rescue this calumniated month from being delivered over to the gloomy period of winter. But, however this disposition may be objected to in the kalendar of the naturalist, the medical inquirer will, it is presumed, find in the tables themselves sufficient reasons for its adoption.

In deducing inferences from the sixteenth table, no risk is incurred of erroneous conclusions from the operation of partial causes. It includes a mortality to the extent of six hundred thousand persons, occurring at various periods in the course of the last seventy years of the last century, in towns and in the country, in places remote from each other, and subjected by situation to as great variation of climate as can occur in so limited a space. The counties of York, Middlesex, Lancaster, and Devon, from their relative position, may be presumed to afford a

mean of the variations of the weather, indicated by the barometer, thermometer, and hygrometer, in the southern division of the island.

From this table, thus comprehensively formed, it appears, that the mortality is greatest in winter; but little less in spring; considerably diminished in autumn; and in summer much further reduced. The difference between the mortality in summer and winter is nearly as four to five; and if the summer and autumnal period be contrasted with the winter and vernal portion of the year, it will be as six to seven. Retaining this table as a standard of comparison, in examining the other tables, from which it is formed, a generally prevailing correspondence will of course be expected. Some variations in degree will, however, be found, and some deviations from the general course. The difference between the winter and summer half-year is less in the London table than in any of the others, and greatest in Warrington, Ches-

ter, and the country parishes in Devonshire. May it hence be inferred, that, where the relative general mortality is least, the proportion between the mortality in summer and winter will be greatest? For example, in the district in Devonshire confined to the three towns, the annual mortality is 1 in 25* ; in the district comprising three adjacent country parishes, it is 1 in 45 : in the former, the deaths in the summer half-year are to those in the winter as 6 to 7, in the latter as 5 to 7. Or, is the difference of proportion in London to be ascribed to this circumstance, that the metropolis has less than the usual proportion of persons of advanced age, whose deaths happen most frequently in winter, owing to the retirement of many towards the close of life, and the increased proportion of people of

* Perhaps the annual mortality is in this instance stated too high ; the grounds upon which it is so stated, are mentioned in page 151 *note*. For the purpose, however, for which the statement is here made, it is sufficient that the mortality be admitted to be greater in large towns than in the country, which is undeniable.

middle age derived from the perpetual recruits, which the population is receiving from persons of that description?

The deviations from the general inferences are chiefly to be found in the eleventh table. In the country parishes, from the registers of which it is formed, the mortality is greatest in spring, and is particularly excessive in the months of April and May. As in winter it is comparatively less, so in autumn it is rather greater. May it from these facts be induced, that life is more directly subjected to the influence of weather in the country than in towns; and that the diseases of spring and autumn, particularly of the former, are those to which the inhabitants of the country are most obnoxious? If the limited extent of the table forbid the confident adoption of these conclusions, to future observations must be left their establishment or refutation.

Further exceptions occur in the eighth, twelfth, and fifteenth tables, and also in

the tenth. In the three first, spring is found to exceed winter in fatality, and in the last summer yields in healthiness to autumn.

If an exception be taken to the ratio of comparative mortality deduced from the aggregate table (XVI.) on account of the influence of the London table, which has been shewn to differ materially from the others, the necessary correction will probably be made, and an approximation to a fair general average obtained, by stating the deaths in the winter half to exceed those in the summer half of the year by one fifth of the whole. But if no such exception be taken, the mortality in the different seasons may be apportioned on the following scale, presuming upon the grounds formerly stated, the whole annual mortality of Great Britain to amount to 275,000.

Mortality in summer	60,400	} 275,000
autumn	66,800	
spring	73,650	
winter	74,150	

To each of the tables is subjoined a succession of the months in the order of their fatality. If, for the purpose of comparison with other months, an equal number of days be assigned to February, this month will be found most abundant in deaths. In one or two instances only it is exceeded by March and April. June, which is classed in the most healthy season, yields, in many instances, in salubrity, to some of the autumnal, and even winter months.

If from the records of death in large districts, in all the various forms in which it assails mankind, our attention is directed to its more confined operation in a small circle, where it acts through the medium of decided disease, it will appear from the deaths at the Dispensary in six years, that the difference in the influence of the seasons is still more strikingly contrasted. From the nineteenth table it will be found, that the deaths from December to May inclusive exceed those in the remaining months in the proportion

of three to two; and that the mortality in the winter is double to that in the summer period.

But it may be justly observed, that the scale of mortality in the different months is not a criterion of their respective unhealthiness, if that is to be estimated by the frequency of disease. If in times past, when vaccination had not yet extended its security to millions, influenza had prevailed in the spring, and small-pox had raged in autumn, the former season might doubtless have been deemed the most sickly, although the latter would have been distinguished by a dreadful superiority in fatality. But exclusively of extraordinary sources of variation, the proportion of death will certainly not be found to correspond with the proportion of disease occurring in the same month; neither will so marked a difference be observed to subsist between the unhealthiness of different months, or seasons, by the one criterion, as by the other. At least these conclusions seem to be war-

ranted by the monthly returns of admission to the Liverpool Dispensary during seventeen years, and to the Plymouth Dispensary during six years.

At Liverpool, the succession of the months, in respect to the frequency of disease, is in the following order: March, April, January, October, May, December, November, February, June, September, July, August. At Plymouth, the succession upon the same principle is March, January, February, May, November, September, December, October, April, June, July, August; and the difference in the two months, which form the extremes, is only as eleven to nine. If the contrast be extended to longer periods of time, the twenty-second table shows, that the proportion of patients admitted at the Dispensary in the summer is to that in the winter as nine to ten, and that the proportion in summer and autumn is to that in winter and spring as nineteen to twenty.

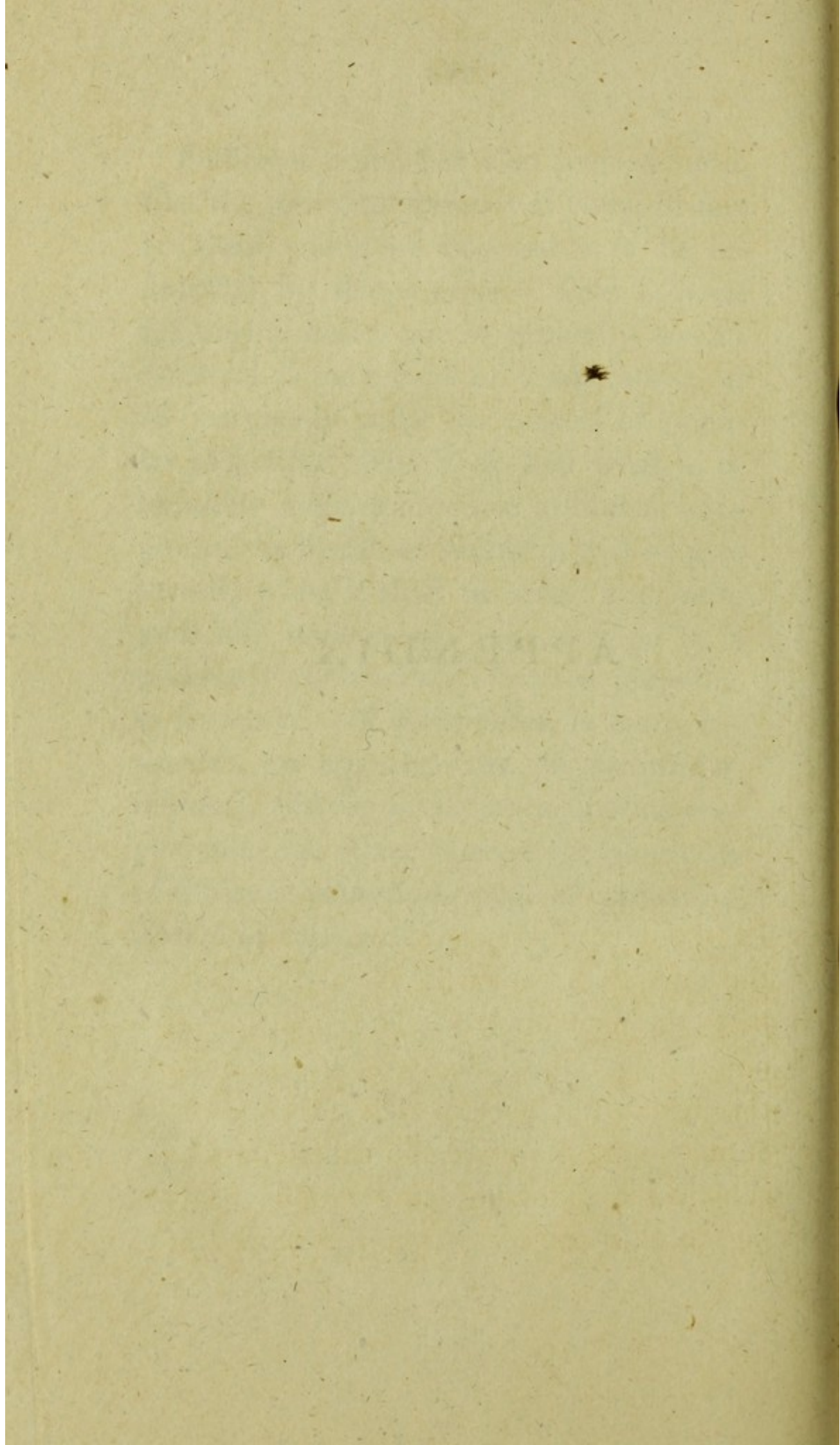
The popular opinion of the extensive prevalence of autumnal diseases is not confirmed by this statement, in which autumn maintains the second place among the seasons in the scale of salubrity. The refutation, however, of this opinion cannot be rested on inferences derived from the limited period of six years, in which the autumnal epidemic cholera has not been of frequent occurrence.

These and many other points may easily be determined, if they shall be deemed worthy of further investigation.

Upon the whole, sufficient proof seems to have been adduced, that in this country the warmer months are most favourable to the health of the inhabitants; and that disease and death extend their influence with the increase of cold in our ordinary winters. That their influence is prodigiously augmented by any extraordinary degree of cold, the winter of 1795 has placed beyond all question.

Sufficient proof has also been adduced, that the prevalent diseases of Great Britain are those which are most liable to be influenced by temperature. Few subjects relating to health are so generally misunderstood as the effects of temperature, or so completely under the control of popular prejudice. The lives, and what is of infinitely more importance to human happiness, the health of numbers will be preserved, when it shall be better and more generally understood. At present it is peculiarly unfortunate, that the prejudice in favour of cold contributes, in many instances, to augment the disposition to disease; and the prejudice against its employment too often deprives the physician of the most efficacious mode of combating disease in existence.

APPENDIX.



No. 1.

PROPORTION

OF

MORTALITY

TO

POPULATION.

IN the preceding pages, when assuming the annual mortality in Great Britain to be to the population in the proportion of one to forty, the difficulty of ascertaining this relation in general was adverted to. It may not, therefore, be superfluous to subjoin the following observations relating to this subject, from the works of

Dr. Price, together with a table, the materials of which, with some exceptions, have been drawn from the same source.

“ The ingenious Susmilch, to whose works (says Dr. Price) I owe my observations concerning Berlin, makes the proportion of people who die annually in great towns to be from 1 in 28 to 1 in 24; in moderate towns, from 1 in 28 to 1 in 31; and in the country, from 1 in 40 to 1 in 50. The observations and facts, produced in this work, prove, I think, that these proportions may be more truly stated as follows :

In great towns, from 1 in 19 or 20 to 1 in 23 or 24.

In moderate towns, from 1 in 23 to 1 in 28.

In the country, from 1 in 35 or 40 to 1 in 50 or 60.

“ To these proportions exceptions will, however, occur in particular places from local circumstances.

“ Susmilch supposes the proportion of inhabitants of the country to those of towns to be $3\frac{1}{2}$ to 1. This, I think, he

has rendered sufficiently probable in Pomerania, Brandenburg, and some other countries. In well-peopled countries, the proportion may be just: in Sweden, it is computed that the inhabitants of the town are to those of the country only as 1 to 13."

Price on Reversionary Payments,
vol. i. 5th ed.

TABLE XXIII.
Proportion of the annual Mortality to the Population in various Parts of Europe.

1763	Stockholm	1 in 19		
	London.	—	20.7	
	Edinburgh.	—	20.6	
1761 to 1771	Rome	—	21.5	
1747 — 1776	Amsterdam	—	22	1695
	Liverpool.	—	24.7	
	Norwich.	—	24.5	
	Plymouth*	—	25	1799—1804
	Berlin	—	26.5	

1787	Vienna	—	26.4	Shrewsbury—Northampton.	—	1770
		—	27.7	Birmingham	—	1770
		—	27.5	Newbury (town)	—	1747—1765
	Petersburgh—Breslaw	—	28	Manchester (town)	—	1773
		—	29.7	Warrington.	—	
	France	—	30		—	
		—	31	Speen, Berkshire	—	1724—1757
1754	Moscow (Prov.)—Wirtemberg. (Duchy)	—	32		—	
	Sweden	—	35		—	
		—	36	Chester	—	1772—1781
1777	Naples	—	37		—	
		—	39	Blandford	—	1772

1098 Parishes	—	43		
Swinderby, Lincolnshire . .	—	44	1771	
Pays de Vaud	—	45		1799—1804
Plympton, Plympton St. Ma- ry, Plymstock	—	47		
Ackworth, Yorkshire.	—	48		
Norway	—	49		
Biddulph, Staffordshire . .	—	50	60 years.	
106 Parishes—Madeira . . .	—	54		
A country Parish, Hampshire	—	56	90 years.	
Stoke Damarell, Devonshire .	—	56	1733	
Manchester Parish, exclusive of town.	—	56		
Okeford, Devonshire	—	68	1770	
Moreton, near Manchester.	—			

• As in a town, circumstanced as Plymouth is during war, the calculation of an average mortality is attended with great difficulty, and may, in this instance, be very erroneous, it will be proper to state the grounds upon which the proportion has been assumed. The population has been estimated at 16,000, and the annual average of deaths at 640. This average was made from the years 1799, 1800, 1801, 1803, and 1804: the year 1802 being excluded as a year of peace. This exclusion was judged necessary, because the population having been taken during war, the deaths ought to be averaged from years of war also, provided allowance be made for military deaths, the military not being included in the enumeration of the inhabitants. This allowance has accordingly been made by deducting thirty deaths annually on this account. A nearly similar proportion of mortality results from confining the comparison of burials with inhabitants to one of the two parishes in the town, namely Charles, in which parish, the burials are but little affected by the mortality of the military. In common with other large towns, there is the chance of inaccuracy from the difference between the numbers carried out and brought in for interment. There are, however, no particular reasons for suspecting this to be in any great disproportion at this period.

† In this parish, the inhabitants of the town are stated to be five in twelve, and those of the country seven in twelve.

No. 2.

TABLE XXIV.

POPULATION, &c.

OF

PLYMOUTH, PLYMOUTH-DOCK, AND STONEHOUSE,

INCLUDING THE PARISHES IN WHICH THEY ARE SITUATED,

FROM THE RETURNS TO PARLIAMENT IN 1801.

Parishes.	Uninhabited houses.	Inhabited houses.	Families.	Males.	Females.	Employed in agriculture.	Engaged in trade, &c.	Not comprised in the preceding classes.	Total.
Saint Andrew,	4	1071	2107	3549	5178	29	1524	7174	8727
Charles,	23	666	1892	3128	4185	74	1919	5320	7313
in									
Plymouth,	27	1737	3999	6677	9363	103	3443	12494	16040
Stoke Damarrell*,	42	2352	5970	10075	13672	750	3650	19347	23747
East Stonehouse,	20	358	739	1264	2143	10	215	3182	3407
Total	89	4447	10708	18016	25178	863	7308	35023	13194

* In the year 1733, the inhabitants of the parish of Stoke Damarrell were found, by a survey made by the Rev. W. Barlow, to amount to 3361. In the same year, according to the register, the baptisms were, of males 61, of females 61, total 122; the weddings 28, and the burials 62.

Phil. Transact. vol. 31.

TABLE XXV.

RELATION OF DEATHS IN SUMMER AND WINTER, AT DIFFERENT PLACES.

Period of calculation.	Places.	Deaths.		Proportion.
		Summer. ¹	Winter. ¹	
13 years	² Sweden	18880	20690	10 to 11
5	{ ² Eccles, near Man- chester }	415	455	10—11
40	³ Blandford	617	725	10—11.8
15	⁴ London	122611	146917	10—12
60	² Vevey, Switzerland	1697	2140	10—12.5
40	³ Blandford	645	829	10—12.8
20	² Gainsborough	590	765	10—13
6	⁵ Plymouth	1103	1446	10—13.1
5	² Stockholm*	1139	1515	10—13.3
	² Edinburgh			10—13.3
9	² Manchester	1788	2427	10—13.3
	⁶ 25 country towns } in England . . . }	52508	66357	10—13.5
7	⁷ York	955	1210	10—13.5
3	⁸ Chester	340	478	10—14
8	² Warrington	692	968	10—14
6	{ ⁸ Plymouth Dispen- sary }	69	121	10—17

^{1 1} Summer includes June, July, August, and September; Winter includes December, January, February, and March.

^{2 2 2 2 2 2 2 2 2} Price on Reversionary Payments, 5th ed. ii. 270, *note*.

^{3 3} Phil. Trans. vol. 68. In the first instance, the deaths from small-pox are excluded.

⁴ Short's Observations.—Heberden, 48.

⁵ Tab. XVII. completed to six years, 1799 to 1804 inclusive.

⁶ Short's Observations.—Heberden, 47.

⁷ White.—Heberden, 49.

⁸ Table XIX.

* In the note above cited from Price, the number of deaths at Stockholm are transposed as to the seasons; but as this place is not cited as an exception, the supposed error has been here corrected.

The following is a list of the names of the persons who have been
 admitted to the office of Justice of the Peace for the year 1881.
 The names are arranged in alphabetical order, and the names of those
 who have been re-elected are marked with an asterisk (*).

* John A. Adams, * John B. Adams, * John C. Adams, * John D. Adams,
 * John E. Adams, * John F. Adams, * John G. Adams, * John H. Adams,
 * John I. Adams, * John J. Adams, * John K. Adams, * John L. Adams,
 * John M. Adams, * John N. Adams, * John O. Adams, * John P. Adams,
 * John Q. Adams, * John R. Adams, * John S. Adams, * John T. Adams,
 * John U. Adams, * John V. Adams, * John W. Adams, * John X. Adams,
 * John Y. Adams, * John Z. Adams, * John A. Adams, * John B. Adams,
 * John C. Adams, * John D. Adams, * John E. Adams, * John F. Adams,
 * John G. Adams, * John H. Adams, * John I. Adams, * John J. Adams,
 * John K. Adams, * John L. Adams, * John M. Adams, * John N. Adams,
 * John O. Adams, * John P. Adams, * John Q. Adams, * John R. Adams,
 * John S. Adams, * John T. Adams, * John U. Adams, * John V. Adams,
 * John W. Adams, * John X. Adams, * John Y. Adams, * John Z. Adams.

AN
INQUIRY
INTO THE
INFLUENCE OF SITUATION
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ON
PULMONARY CONSUMPTION,

&c. &c.

JOHN G. MANSFORD,

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LONDON:

W. G. LONDON, 107, NASSAU ST. N.Y.

1818.

THEORY

OF THE

OR

INQUIRY

INTO THE

INFLUENCE OF SITUATION

ON

PULMONARY CONSUMPTION

&c. &c.

BY

1844

LONDON:

PRINTED BY RICHARD CLAY AND COMPANY, BUNGAY, SUFFOLK.

AN
INQUIRY
INTO THE
INFLUENCE OF SITUATION
ON
PULMONARY CONSUMPTION,
AND ON THE
DURATION OF LIFE.

ILLUSTRATED BY
STATISTICAL REPORTS.

BY
JOHN G. MANSFORD,

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Preface.

THE substance of the following pages was first written for insertion in one of the Medical Periodical Publications; but enlarged views of the subject, and additional facts, extended it beyond the ordinary limits of that species of composition, and induced the author to alter his original plan, and to give his paper its present shape. But a more important consideration fixed him in this resolution. The error (if it be such) which it was intended to expose, belongs to both the physician and the patient; and to accomplish the object desired, the inquiry must be rendered accessible to both.

It does not appear that the choice of situation for a consumptive patient, unless with a view to

mildness of temperature, has been considered of much consequence ; provided it were one of those which fame as reputed healthy. The patient, to whom this remark principally applies, perhaps, deems any advice on so common a matter unnecessary ; and the nearest situation of this description will be the one resorted to. Neither can it be said, except with the view above-mentioned, and in the parallel one of change of climate, that medical authors have been much more precise in their instructions on this subject. They have for the most part directed, that a situation enjoying a pure and salubrious air should be made choice of : but in what this supposed salubrity consists ; or whether it is equally adapted to every variety of disease, they have not stopped to inquire. Situations which have been famed for the longevity of their inhabitants, have been very generally selected as the most favorable for the recovery of the sick : but what a fatal error this may lead to, with regard to the consumptive, will be seen in the course of the following treatise. It will also, it is hoped, appear evident, that the choice of situation for patients of this class, is a matter of considerable importance. The prac-

tioner should be in possession of fixed and certain rules to guide him in his instructions on this point, and he may expect a more ready and early acquiescence on the part of his patient. The sick should be left to their own discretion in nothing. The consumptive especially, at all times slow to perceive the real nature and tendency of their malady, may with difficulty be persuaded to adopt the measure of removing to a more favorable situation, before it be too late : — or if left to their own inclinations, or the guidance of popular opinion, may, in removing, commit a fatal error.

It is on facts connected with statistical medicine that the selection of the most salutary situations for different forms of disease must be grounded. Facts of this nature have already extended the boundaries of medical science ; but they are still very defective. Much information of an interesting and valuable kind, remains for the research of the curious, and from which the sufferer under many forms of chronic disease may reap advantage. In offering a small contribution towards this desirable end, the author has to regret that it is so limited : but the fault of its

limitation does not rest with him. Numerous inquiries have been made which have failed to produce satisfactory replies. Many medical men are not in the habit of keeping case books; and in some populous districts, the different parishes are so intersected by different practitioners, that it has been found impossible to collect accurate reports of the mortality from any distinct disease.

These defects can only be remedied by an act of the legislature. If a certificate were required of the medical attendant of the cause of death, to be delivered at or before the time of interment, for insertion in the parish register,—so that the age and disease of all who died in every parish might be obtained by a reference to its books,—a record of facts would be established, valuable beyond all which the medical or philosophical inquirer has now access to. To render this stock of information still more valuable, some of the most striking localities of each parish should also be recorded; as soil, elevation, the results of meteorological observations, &c. The soil and elevation might be obtained from surveys already made, or by others appointed for the purpose. A

meteorological journal might be kept by any intelligent resident, who might be furnished with instruments for that purpose by the parish; to which, if required, a small gratuity might be added for the trouble.

If something of this kind had been adopted in different countries, we should be at no loss to determine the fittest situation for the consumptive. "But as the preservation of mankind has never been judged worthy of those grand, systematic measures which have been incessantly employed for their destruction, we do not possess a proper stock of comparative knowledge." In the absence of such knowledge, and as the result of the following inquiries, it appears probable that we possess in our own country (if comparative exemption from the disease can entitle them to such a distinction) situations as favourable for the residence of those labouring under pulmonary consumption, or predisposed to it, as any of those so highly boasted of in the more Southern parts of Europe. And it is earnestly to be desired, that those practitioners who reside in situations possessing the required local advantages, would take

pains to collect and to publish such information, as may throw additional light on a highly interesting inquiry. Medical societies at their occasional meetings, may be able to collect from their different members assembled from an extensive and varied surface, much local and comparative information. The author's connection with a society of medical practitioners, extended over a district admirably constituted for such an inquiry, has given him additional facilities of prosecuting it with effect : and to the liberal communications of these gentlemen he is greatly indebted for the success which has attended it.

With respect to the second part of the following treatise, it is an extension of the same course of inquiry as that pursued in the first ; from which it receives, and on which in its turn, it reflects, illustration and support. It equally concerns the aged, the constitutional invalid, the convalescent from acute disease, and the calculator on the probabilities of human life.

Frome, July 25, 1818.

PART I.



ON THE

INFLUENCE OF SITUATION

ON

PULMONARY CONSUMPTION.

ERRATA.

PAGE	LINE	
11	3	After <i>to</i> read which.
30	13	Dele comma.
53	8	For <i>his</i> read its.
69	19	For <i>exhile</i> read exile.
75	2	For <i>were</i> read where.
77	9	For <i>conformation</i> read confirmation.
80	2	For <i>Austurias</i> read Asturias.
124	15	For <i>There</i> read Their.

ERRATA.

	Page	Line
For their read their	12	12
For distance read distance	9	9
For comparison read comparison	9	9
For now read now	2	2
For cubic read cubic	10	10
For the read the	8	8
Dois count	17	17
After to read which	5	5

2

PART I.

IN a disease so frequent in its occurrence, so fatal in its result, and which excites so deep an interest, on account of the age, and character, of those who most commonly become its victims as pulmonary consumption, no inquiry which has for its object the acquisition of enlarged views of that disease, or of the means by which it is to be obviated, or removed, can be deemed unimportant. The following observations are designed to call attention to the effect of local situation on pulmonary complaints; and more especially to ascertain, how far they may be supposed

to be influenced by increased, or diminished atmospheric pressure. The question is new, and if the reader should think it too hypothetical to wear a very promising aspect, he is requested to suspend his judgment, till he has heard the evidence upon which it may be rightly formed.

Before entering further into the subject as connected with pulmonary consumption, it may be right to prepare the way by adverting to the opinions of others in any way allied to it. There are I believe but few authors who have ventured to place the mechanical changes in the atmosphere, amongst the causes of disease. Doctor Cullen has mentioned a sudden diminution in the weight of the atmosphere, as one of the exciting causes of hæmoptysis: but this remark led the way to no further observations, nor to any practical directions on the subject of hæmorrhage; nor was it conjectured to be in

the most remote way connected with the causes, and phenomena of phthisis pulmonalis. I am not aware, that amongst the causes which have been assigned, as those which sway the local, and comparative prevalence of this disease, the mechanical influence of the atmosphere has ever found a place. Whether it has any just title to such a distinction, the facts which I have to adduce, aided perhaps by further inquiries, must determine. Sir John Sinclair has pointed out both the principle and its application, as relates to Hæmoptysis; and recommends flying to a "flat or deep country where the air is heavy."* Doctor Johnson in a recent work† observes, that "on many constitutions, and particularly on people denominated nervous, certain barometrical changes in the atmosphere have a remarkable effect. Thus when the glass is very low, the

* Code of Health and Longevity p. 32.

† Influence of the atmosphere on the health, &c.

wind southerly, and a storm impending, such a sense of sinking weakness, tremor, and dejection is often felt by valetudinarians, that they are quite miserable till the equilibrium of the atmosphere is restored, when all their morbid feelings vanish "into air—thin air." But with the highest respect for the opinions of this elegant writer, I am compelled in this instance to dissent from him; and to attribute the distempered feelings which he describes, not to the diminished weight of the atmosphere, but to the "southerly wind," and "impending storm," and probably to some electrical changes accompanying them; which would produce similar feelings, whether the barometer be high or low. It is hoped that this may be satisfactorily elucidated in the course of the following pages:—but it may in the mean time be observed, that from long habits of watching the effects of barometrical changes on health, and disease, I am enabled to state with confidence, that, although the

glass be unusually low, if the air be at the same time clear, and temperate,—no such feelings as those above described, are felt by the majority of valetudinarians.

Doctor Reid has strongly opposed* the preceding hint of Doctor Cullen, and laboured to establish the doctrine of hæmorrhage upon the Brunonian hypothesis of excitability. “Were the fluids,” says Dr. Reid, “circulating through every minute part of an animate body, affected in a similar manner to mercury contained in the tube of a barometer, existence would not merely be supported by a tenure extremely precarious, but the qualities of life would cease to be displayed.” This is undoubtedly true: the motions of the mercury in the tube of a barometer are purely passive; while those of the living body are actuated by a moving principle within: but

* Treatise on Consumption, p. 77.

notwithstanding this property of life, it is equally certain, that these motions may, and do become languid, or excessive, in proportion to the existing force of the moving principle itself, and the resistance opposed to its actions; and instead of saying that "it is in all instances through the medium of the *excitability* that external powers operate upon living existence," I should say, if not in all, it is in the greater number of instances, through the medium of mechanical or chemical agency that external powers operate upon living existence. Every form of disease, may be considered as a temporary superiority, acquired by external causes, over the internal and controlling powers of life; and death and subsequent decomposition, as a total surrender on the part of the vital and individual powers, of their machine the body, to the operation of the universal laws of nature. The effect of chemical agencies on the living body, requires no illustration here: and to say that it is

placed above the operation of mechanical ones, is to refuse instruction from the plainest evidence of our senses. Where is the sovereign power of life when the vessels of any selected surface of the body, may be made to expand, and even to burst, by the removal of the mechanical resistance of the atmosphere? Why do nasal polypi, and other vascular tumours dilate upon atmospherical changes? And why do we sometimes in conformity with the instructions of Dr. Reid himself, contained in another work,* unload the enfeebled vessels, to remove a portion of the mechanical resistance to their freedom of action? This objection of Dr. Reid can weigh but lightly against the dominion of facts. I have only noticed it, that I may not appear to have wilfully shut my eyes to the opinion of a respectable author; and that the question

* Essays on Hypochondriacal and other Nervous Affections,
Ess. 22.

proposed, viz. how far diseases of the lungs, and especially consumption, may be supposed to be influenced by increased or diminished atmospheric pressure, may remain free for unprejudiced inquiry.

There has always existed a great discordance in the directions given to consumptive patients, for their choice of air and situation. By some they are directed to a high situation,* where the air is pure and dry:

* Amongst those who have recommended such a situation, the high authority of Dr. Darwin must not be passed unnoticed. In the third volume of the *Zoonomia* the case of a physician (the late Dr. Currie of Liverpool,) labouring under pulmonary consumption is related; who after various changes of place, made the greatest progress towards amendment at the village of Moffat in Dumfriesshire, situated about 500 feet above the sea. From this circumstance, he does not hesitate to recommend an elevated inland situation as the best adapted, under certain circumstances, for consumptive patients. But not to say that such a hasty inference from a solitary case was unworthy of the author of *Zoonomia*, the

by others a low and moist one, but this more for shelter and uniformity of temperature, than from the view I am about to take of the subject; by others again, the sea side is recommended. But nearly all agree in the superior advantage to be derived from a free, and pure air; and in this general direction, popular opinion fully coincides. It has however been asserted by some respectable authorities, that low and moist situations, especially those where intermittent fevers are endemial, are unfavourable to the production of consumption; and by parity of reasoning, that

patient was improving when he arrived at Moffat; and there were besides, other circumstances which had their share in contributing to his recovery; amongst which were, the advancing season of the year, and a steady perseverance in almost incessant exercise in a carriage or on horseback.

Dr. Johnstone, after practising more than thirty years at Moffat, says, expressly in a letter to Dr. Garnet, that the symptoms of consumptive patients were generally aggravated during a residence at that place.

such situations were best adapted to its removal where it already exists. Doctor Wells has supported this opinion in the third volume of "Transactions of a Society for the improvement of Medical and Chirurgical knowledge." Sir James Macgregor, in his observations on the diseases of the army in Portugal, also gives his testimony to the same effect. Dr. Harrison, whose situation afforded peculiar opportunities of observation, says, in an address to the Medical Society of Horncastle, in Lincolnshire, that idiopathic consumptions which were frequent in the wolds of that county, were seldom found in the fens; which he attributes to a difference in the component parts of the air in those situations. This observation was confirmed by Mr. Wayet an experienced practitioner at Boston. Dr. Harrison also asserts on the authority of Mr. Boucherett, M. P. for Great Grimsby, that consumption is a rare disease in Holland. We have also the testimony of Doctor Cogan, who

resided several years in that country, that consumptions were much less frequent than in England. These concurrent testimonies, to others might be added, would appear sufficient to establish as a fact, that air impregnated with moisture, or with different effluvia, or miasmata, by which its purity is lowered, is rather favourable to pulmonary consumption than otherwise. But air answering to these conditions, is for the most part, only to be found in low situations; where the increased density of the atmosphere, and the resistance offered by it to inordinate action of the vessels, especially of their extreme branches, may be supposed to have a share in the beneficial effect.

These facts strong as they are, may fail to produce a general conviction of the advantage of low situations in consumptive complaints. The tide of popular prejudice sets full against it, and the medical adviser must

be prepared with substantial arguments when he proposes to his patient a removal to such a situation. His friends will perhaps consult only convenience in removing for a change of air, considering every change as alike:— or, they will be guided by what has been said to be the almost universal popular opinion on this subject:—or they will, perhaps, consult their system of domestic medicine; where they will be directed, if living in a town, or close situation, to quit it as speedily as possible, and seek a free, and pure air, to obtain which, an open, and perhaps an elevated situation will generally be selected: while the patient himself knowing enough of his disease to consider it as a decay of the lungs, shudders at the idea of a low situation, and fancies that he will not have air to breathe. But the difficulty does not end here. Almost every county, or indeed every neighbourhood of much smaller dimensions, has its Montpellier, some favoured spot celebrated from

time immemorial for superior healthfulness and salubrity; terms of vague import, when meant to apply to every species of bodily distemper. To these situations, the victims of chronic disease indiscriminately resort, with equal expectations of recovery: and thither will our consumptive patient fly, with the same hopes, although it may be the very worst place he could inhabit.* If the medical

* A remarkable, though by no means a singular instance of the obstinacy with which consumptive patients continue to resort to places, which years of fatal experience have proved to be prejudicial, may be found in a communication from Mr. Archdeacon Blackburn to Dr. Percival, published in the 65th volume of the Philosophical Transactions. Speaking of Richmond, in Yorkshire, he says, "The air seems peculiarly unfavourable to consumptive disorders. Many strangers come hither from different parts, in the first stage of phthisis pulmonalis; but after thirty-five years of experience, I may truly say that not one has recovered, although the utmost care has been paid to their respective cases." In a short sketch of the medical topography of the same place, given in the first volume of the Medical Repository, it is stated to be very elevated, and

attendant is consulted in the matter, he will perhaps not think it necessary to enforce any particular situation, or will content himself with recommending some place of general reception for these unhappy sufferers, as Clifton. If others are consulted, it may happen, as I have more than once known to be the case, that a different situation may be recommended by each: one advising the sea side, another a low and marshy situation, and a third a high and dry one. Amongst these conflicting opinions, the patient and his friends are still left at

particularly obnoxious to phthisical patients, but in other respects very healthy. Dr. Southey who has quoted the above observation of Mr. Archdeacon Blackburn in his Treatise on Consumption, adds in a note taken from the *Dict. de Sciences Medicales*, that "It is a well known fact, that upon the Hill of Montmorency, near Paris, which is dry and sandy, and exposed to a very keen air, patients with ulcerated lungs suffer very much, and find their disease aggravated, and rendered soon fatal; whereas almost all other patients, especially *les cachectiques* find singular benefit there."

liberty to choose a situation for themselves ; which, if there be any truth in these remarks, will, in nine times out of ten, be a wrong one.

Whether an accelerated circulation be considered as the cause, or effect of the diseased actions which give rise to pulmonary consumption, it is not necessary to inquire. It is sufficient to know, that such a state of the circulation is incompatible with any amendment in the diseased state of the lungs: and the first, and most important indication in the curative means to be employed, is to remove or to retard this morbid acceleration, especially in the lungs ; and it appears that such a state must be considerably influenced by increased or diminished atmospheric pressure: and that by keeping this fact in view, in our choice of local situation for patients thus circumstanced, we possess additional means for furthering the indication required.

The sensations experienced by aeronauts, and by those who have ascended high mountains, may throw some light on this subject. These sensations have been described as occasionally resembling those of intoxication. At others, great lightness and agility have been experienced, but soon terminating in weariness; hæmorrhages from the nose and lungs; sickness; difficulty of breathing, and hurried respiration on the slightest exertion; a quickened pulse; painful distension of the eyes and ears, and palpitation of the heart. Doctor Halley relates of himself that he experienced very painful feelings on ascending from a great depth in a diving bell; the circulation not being immediately able to accommodate itself to the sudden removal of so great additional pressure.

The effect produced on animals, and parts of animals, in air of still greater rarity, may throw additional light on our subject. Mr.

Boyle in his experiments with the air pump, related in the philosophical transactions, having placed the heart of an eel in the exhausted receiver, observed it to grow tumid, and to beat more swiftly than before. The bodies of living frogs and vipers were observed to swell prodigiously in the vacuum, and many other animals to pant and breathe quickly: and we all know what happens in the common operation of cupping. In so great expansion of the fluids, the force which the vessels must have to sustain, may readily be conceived; especially the superficial ones; and as such in this view of the subject, the vessels of the lungs must be considered.

It may be supposed, that although the elevated summit of a high mountain, or the vacuum of an exhausted receiver, produce such remarkable effects; the comparatively trifling variations in the habitable surface of the earth, cannot produce a sufficient change in the

constitution to merit a serious consideration in the treatment of disease:—but it will not, I trust, be difficult to demonstrate, that this opinion is erroneous. The difference of elevation in two situations not far removed from each other, is often much more than would be suspected. A rise of several hundred feet may be so gradual, as not to be apparent in the general outline of the country. The effect of such a difference, is perhaps more immediately conspicuous in the subjects of asthma, than in those of any other disease. It is no uncommon thing to hear patients afflicted with this disease, complain of being unable to live in certain situations. I have known two or three instances of such patients quitting a low situation, to reside in a higher one, who after long continued, or repeated trials, have never been able to accommodate themselves to it. The baneful effect of the new situation has, in such instances, been ascribed to some undefined peculiarity in the air—to the nox-

ious effluvia of a town, in which some particular trade is carried on—to difference of temperature—to any thing but what appeared to me to be the true cause, which in these instances has appeared to be confirmed, by the sufferers not being able to obtain a respite from their disease, in any part of the surrounding neighbourhood, preserving nearly the same level.

But we may come by an easy method, at more direct, and precise conclusions on this subject, An elevation of 500 feet (a very common variation in the surface of a hilly country) diminishes the average weight of the atmosphere pressing on the human body, something more than a sixtieth part, or nearly 600 pounds; and although this reduction of pressure is not felt, it cannot be doubted but that the removal of so large a degree of resistance, must give greater freedom of action to the main spring of the circulation, as well as a

greater power of distension to the vessels themselves ; especially as was before remarked, to the superficial vessels : both of which causes, like all others, will operate most powerfully upon a diseased part.

I have found in my own person, that an elevation of 500 feet, has caused an acceleration in the pulse of five or six beats in a minute. I have also found, that any motion of the body, as rising from a sitting, to the erect posture for instance, has produced a greater corresponding increase of pulsations in the high situation than in the low one. These experiments have been repeatedly made with the greatest care : and without pretending to vouch for the accuracy of the proportions, I think I may venture to assert that they make something like an approximation to the truth. If also this difference is to be observed in health, while the controlling power of life is in undiminished strength and action, and the balance

of the system under due regulation;—how much more may we not expect it to hold, when this power is weakened; and the delicate tissue of the lungs become enfeebled, or disorganised. In such a state of the pulmonary structure, the action of its vessels, from their greater irritability, and their exposed and unprotected situation—will be increased in a ratio greatly exceeding that of the other vessels of the body; and where a healthy person finds no change in his feelings; a patient thus circumstanced, will experience oppression at the chest, and difficulty of breathing, from the greater influx of blood into the pulmonary vessels. It should be observed that the preceding experiment can only be made on elevations accessible in a carriage, or on horseback: otherwise the labour of ascent will effectually defeat its object. A given time should also be allowed at the two stations for perfect rest before the observations on the pulse are made.

If it be objected, that the interest of the experimenter, might in these instances have affected the result of the experiment—the following observations are free from this objection; and place in a clear and satisfactory point of view, the effects of a great diminution of atmospheric pressure on pulmonary disease.

For two or three days previous to the 7th of December, 1817, the barometer had been gradually declining; when it suddenly fell more than an inch. The whole fall within the three days, amounting to one inch and a half: *viz.* from 29-8, to 28-3, where it remained till the afternoon of the next day; when it again as rapidly rose, and the next morning was 29-1, So sudden and great a reduction in the weight of the atmosphere does not often happen: and I was anxious to ascertain its effects on some consumptive and asthmatic patients then under my care. These effects were just such as I had

reason to anticipate. They were all worse; they all complained of increased tightness on the chest and difficulty of breathing; and the pulse in all was quickened. One of these, who had nearly recovered from a long continued, and most severe attack of spasmodic asthma, suddenly relapsed. I had left him two days before, better than he had been for several weeks before his late violent seizure; but I now found him struggling with another, as violent as that from which he had just escaped: which he described as having commenced suddenly on the evening of the sixth, and continuing to increase in violence to the period of my seeing him. Another asthmatic without a regular paroxysm of the disease, experienced great tightness and pain of the chest: and by subsequent inquiries, I found that many others had been similarly affected. One patient emphatically described his sensations by saying, that he felt as if his body would burst. The effects of this great dimi-

nution of atmospheric pressure and its subsequent increase, on the pulse of three patients in different stages of pulmonary consumption, taken at the same hour each morning, were as follow:

Dec. 8, Barometer 28. 3.			
Michael King,	Æt. 24	- - -	Pulse 116
Sarah Hurl,	— 20	- - -	— 116
John Heritage	— 15	- - -	— 120

Dec. 9, Barometer 29. 1.			
Michael King	- - -	- - -	104
Sarah Hurl	- - -	- - -	108
John Heritage	- - -	- - -	104

Two of these last were pretty nearly the average of the preceeding week: the other, Sarah Hurl, rather above it. Besides this reduction in the pulse,* the tightness and

* It is scarcely necessary to remark that observations on the pulse, in order to obtain an accurate result, should be made as nearly under the same circumstances as possible. The same time of the day — the same position of the body — the same distance of time after taking food — waiting a given time after the

difficulty of breathing were also relieved. William Scammel, *Æt.* 55, and Edward Brookman, *Æt.* 33, both labouring under the same disease, whom I had not an opportunity of seeing on the 8th, corroborated the statements of the others as to their feelings. Two patients with nasal polypi, were also considerably affected. In one case, that of a female who had not found them very troublesome in general ; they descended so as completely to obstruct the passage of the air : but on the following morning I found that they had resumed their ordinary state. The effects of changes in the weather upon polypous tumours, is experienced by every person troubled with them : but it has usually been ascribed to the relaxing effect of moisture, and partly no doubt with truth ; but on the above occasion the atmosphere shewed no unusual degree of mois-

first questions have been asked, and perfect quiet on the part of the patient, must all be strictly observed.

ture, and was remarkably clear. This expansion of the polypus may serve to shew what was going on in the lungs of the asthmatic and consumptive patients ; and we shall see that the increase in the number of pulsations, will not indicate the whole of the mischief. For although the lungs, contained within their bony case, have no power to increase their volume ; the expansion of the blood vessels will diminish the capacity of the air cells, and satisfactorily account for the aggravation of the symptoms ; especially the tightness and difficulty of breathing.

That variations in the temperature could not have much share in the changes which took place in the preceeding cases, will appear by referring to the heat of the days in which these changes took place. The mean temperature of the 6th, 7th, 8th, and 9th, were respectively 38, 41, 41, 36, by which it appears that a considerable reduction took place on

the 9th, which must be considered unfavorable, rather than otherwise, to the consumptive patients at least.

But if from an extensive survey of a district affording the requisite characters for such an investigation, it is found that phthisis pulmonalis and other affections of the lungs are frequent in its more elevated parts, while low and neighbouring lands are comparatively exempt from them ; we shall have sufficient confirmation of the utility of the practical tendency of these remarks, if not of the theory upon which they are founded.

The county of Somerset in which these observations and inquiries have been principally made, affords perhaps the happiest opportunity of acquiring a satisfactory result of any other in the island. A short topographical description will illustrate this. In no county perhaps, are the general outline and features of its dif-

ferent parts more strongly contrasted than in this; the one part abruptly terminating, and the other as abruptly commencing at a line of even and regular division. The long and elevated ridge of Mendip rising on the very edge of the Bristol Channel, traverses nearly the whole breadth of the county from west to east; shutting out from the inhabitant on either side, all view of every thing beyond it. This lofty range forming so prominent a feature in the landscape of the county, is no less conspicuous as constituting the boundary line between lands of widely different character lying to the north and south of it. The first portion, or that which lies between the Mendip hills on the south, and the river Avon on the north, is exceedingly irregular in its surface, but elevated, being for the most part from 300 to 700 feet above the level of the sea. The whole of this district is beautifully but not thickly wooded; the soil varying in its nature and properties, but generally of no great depth, and lying on a substratum

tum of limestone, or of a calcareous sandstone, thickly imbedded with marine substances; both of these are often found projecting in considerable masses above the surface. In this division is included a small portion of the adjoining county of Wilts. The air in such a district may be supposed to possess all the virtues which dryness and purity can give it. The whole has the character of being very healthy, and has afforded many instances of extreme longevity. Intermittent fevers are almost unknown thro' its whole extent; but pulmonary consumption exerts a wide and fatal sway. The other division, or that on the south side of the Mendip hills, consists of many thousand acres of meadow and moor land, but little raised above the level of the Bristol Channel, and a considerable portion of it a few feet below the high water mark. Here the intermittent and remittent forms of fever are frequent, but not so pulmonary consumption; from which this happy region may be said to be comparatively

exempt. These facts, namely, that of its infrequency in this district, and of its greater prevalence in the more elevated one just described, cannot escape the eye of a medical observer, and are unanimously supported by the observations of the medical practitioners in both.

But to determine this interesting question with precision, I have collected from the reports of these gentlemen, the number of deaths from consumption, above the age of 15, in different places in both districts within the last year; and have given their results together, with the necessary localities of each place in the subjoined table. The age of 15 has been fixed as the minimum, that cases of pure pulmonary phthisis only might be enumerated. I have also chosen to give the number of deaths from consumption in a given number of the living, rather than the proportion to the deaths from other diseases: as in this last method, which

is that adopted by Dr. Woolcombe, the result must vary according to the whole rate of mortality, and will be found to exceed the true proportion where that is low, and to fall short of it where high.* The elevations given for the different places are the mean of barometrical admeasurements taken on different parts of their surface. Places of trifling elevation, and which rise from a plain very nearly the level of the sea, as the town of Glastonbury for instance, may be estimated with sufficient accuracy by the eye. It should also be observed, that in the general estimate of the elevation of a place, the inhabited surface only is included.

* Suppose for instance in a place containing 1000 inhabitants, the annual mortality to be 1 in 48, or nearly 21 in the whole, and the deaths from consumption 5; these will consequently be to the whole number of deaths as 1 to 7. But if the rate of mortality should be 1 in 36, instead of 1 in 48, and the whole number of deaths 28, the proportion would be only 1 to 9.56, the real number remaining the same.

	Place.	Population.	Mean Elevation in feet.	Number of deaths from Consumption in one year.	Proportion to 1,000 of the living.
High.	Frome	10,000	450	31	3.10
	Leigh upon Mendip }	750	790	3	4
	Hinton	600	580	2	3.36
	Maiden Bradly	500	750	3	6
	Horningsham	1,000	650	3	3
	Kilmington	600	825	3 ²	5
Low.	Wells	5,000	50	11 ³	2.20
	Glastonbury	4,000 ⁴	25	7	1.75
	Wedmore	3,000 ⁵	50	4.50	1.50
	Axbridge	1,100	50	—	0.20
	Wimbourne in Dorsetshire ⁶ }	3,300	50	7	1.95

(1) The town only, exclusive of the rest of the parish.

(2) Average of five years.

(3) This is supposed to be above the general average for Wells.

(4) Glastonbury and its vicinity, containing a population to that amount.

(5) With its vicinity.

(6) The town of Wimbourne is inserted here from its correspondence with the other places; but the inquiries made in this place were directed to another object, as will be seen in a subsequent part of this inquiry. Its elevation is estimated from its position on the level banks of the Stour; which, running a placid course of not more than twelve miles to the sea, the town cannot much exceed the elevation assigned it.

By this table it appears, that the difference between the low and elevated situations is great indeed; and the particular case of Axbridge is so extraordinary, that I feel it incumbent on me to give the words of the report from which it is taken.*

* Letter from Mr. Good, of Axbridge, to the author.

Sir,

In answer to your inquiries as to the number of deaths that have taken place in Axbridge, and its vicinity, within the last twelve months, from phthisis pulmonalis, I have to observe, that I know of no one instance, either at fifteen or any other age. In short, I consider pure phthisis pulmonalis as by no means a frequent disease in this neighbourhood, having met with only two instances for some years past. These were two remaining sisters (the one twenty, the other twenty-four years of age,) of a large family, who all died consumptive. The town of Axbridge contains from one thousand to eleven hundred inhabitants, and the surrounding villages are populous.

Several cases of hæmoptysis have come under my care within the last few months. Plethora, as a consequence of free living, appears to have been the cause, and they universally gave way to the use of the lancet.

If it be objected that twelve months do not constitute a sufficient length of time to afford a conclusive average, it is hoped that what is wanting in time, may be made up by the number and agreement of the reports; and the objection may perhaps be further removed, when it is observed, that the places from whence the reports are transmitted lie within a circle which the eye may command from a point of eminence, and the period of time in which they are included, is nearly the same in all. It may be justly supposed then, that the causes,

I delayed answering your letter that I might inquire how far the practice of my neighbours agreed with my own, and I have the satisfaction to say, that they have been nearly similar.

I am, Sir,

Your very obedient servant,

Axbridge, Oct. 22, 1817.

J. GOOD.

As the vicinity of Axbridge is included in this report, it is probable that the proportion given in the table, low as it is, may yet be higher than the truth. This neighbourhood may indeed be said to enjoy an unheard of exemption from pulmonary disease.

be they what they may, which influence this disease, must have operated equally upon all: and whether we consider the actual numbers as affording the usual average of each place or not, the proportional ones may be considered as perfectly satisfactory. But I have no reason, either from what has come under my own observation, or from the statements connected with the different reports, to consider them (with the exception mentioned in the table) as being any other than the ordinary average of successive years.

There are some other circumstances connected with the localities of the low situations mentioned in the table, which it may be necessary to explain, in order to set in as clear a light as possible the probable causes of exemption from consumptive complaints. The town of Axbridge, in which the most remarkable exemption appears, is a little elevated above the moor, just sufficient to escape the

prejudicial and chilling influence of concentrated moisture, or of any other noxious matter. The marshy ground occupies only one side, and that removed to some distance; while the other places, with the exception of Wells, are nearly surrounded by it, and the greater part of their surface on a level with it. It will be recollected, that the authorities adduced in the early part of this paper, attributed the comparative exemption from consumptive complaints which they had remarked in marshy situations, to their quality as such, or to a reduction in the purity of the atmosphere: but the above facts seem to declare, that it is on some other principle that we are to account for the salutary properties of such situations.

To the instances enumerated in the table, may be added those of Shrewsbury and Carlisle; the first of which, according to the registers of the Rev. Mr. Gorsuch, gives a

proportion of 6* to 1000 of the living, and the latter, according to those of Dr. Heysham, 1.92. Now the position of Shrewsbury on the Severn, at the distance of 100 miles from its mouth, must give it an elevation of at least 400 feet; while that of Carlisle, on the Eden, can scarcely amount to a fourth-part of that altitude. The proportion assigned to Shrewsbury is extraordinarily great, and perhaps may be swelled by the admission of diseases which could not properly be called pulmonary consumption; but even making a deduction on

* The population of Shrewsbury is 18,543: the annual mortality, at the time these registers were kept, 1 in 26, which gives for the whole mortality 713. The deaths from consumption in the whole population, are to the whole mortality, as 1 in 4, or as 11.14 to 1158.75 of the living, which, for convenience of numbers, and to avoid the side of excess, may be called 9 in 1000; from which, deducting one-third for those under 15, which appears by Dr. Heysham's tables to be the proportion of those who die under that age to those above it, there will remain six.

this account, the proportion must still be high. With respect to Carlisle, the extreme minuteness and accuracy of Dr. Heysham's registers, leave no doubt of the proportion being perfectly correct.

There is one circumstance of a practical nature arising out of this part of the present inquiry of vast importance. The relative prevalence of consumption, in high and low situations, although leading to an inference exceedingly satisfactory, does not afford a true measure of the effect which we may expect will be produced by a removal to the one situation, of a person who has resided in the other. Where there is an undoubted predisposition to the disease, or where its ad-
 monitory symptoms may have already shewn themselves, a removal to a lower situation, when practicable, may avert it in the one case, and suspend its progress in the other. While, on the other hand, quitting the accustomed situation,

to reside in a higher one, may call the disease into immediate action where latent, and give it new force where it has already commenced. The natural powers of the constitution in the situation to which it has been habituated, may be able to maintain, for a time, the struggle with its deadly foe, and to postpone the visible advances of disease:—but if a powerful auxiliary be abandoned by removing to a more elevated site, the disease once set free from constitutional controul, will run its course with fatal rapidity. A medical friend informs me, that two members of his own family sunk rapidly under pulmonary consumption after quitting low situations to reside in elevated ones. A similar fate attended a medical gentleman who practised some years ago at Wells, who fell a prey to the same disease shortly after leaving that city to practise in an elevated part of Gloucestershire. The universal fatality attending this disease in the numerous cases which are reported to have resorted to Richmond,

in Yorkshire, will also illustrate this part of my subject; and I think it will not be asserting too much to say, that to remove to situations higher than that which had been previously inhabited, in any stage of pulmonary consumption, is to run into the very jaws of death.*

I would wish not to be prolix in my observations, or advice on this subject; but I am

* The greater degree of cold, in an elevated situation, has generally been assigned as the reason of its being unfavourable to consumptive diseases, where that has been noticed, as in the case of Richmond: but if this were the true cause, a greater proportion of such diseases should be found at Carlisle than in the elevated places which have been described, situated four degrees farther to the south. Every degree of latitude removed from the pole, gives, other things being equal, about a corresponding degree of annual temperature; and every 250 feet from the earth's surface diminishes the heat in the same proportion. If temperature then were the only cause of difference in the proportion of pulmonary disease, this should be smaller at an elevation of 700 feet, in latitude 51, than at the level of the sea, in latitude 55.

anxious to say enough to fix the serious attention of the parents, and relatives of consumptive families, on these important truths, for such, I think, I am warranted in calling them. How many parents are there at this moment suffering under the anguish of recent, perhaps of repeated losses from this devouring disease; trembling for the fate of the one which appears to be marked out for the next in succession, at whose vitals the monster's dart is already pointed, and eagerly looking round for directions what step to pursue, uncertain whether to remain or to fly,—and if to fly, whither to go! To such I would exclaim with all the earnestness which a conviction of its importance must naturally excite—fly—fly if it be in your power, and before it is too late, from the fatal spot. It may be death to remain; there may be safety in flight. Fly then to some more favoured situation, answering in its character to those which have been described. If you know not wher else to find such an one, (and

there are probably not many,) go thither without delay.

As the practical design of this inquiry is to ascertain, upon certain data, the most salutary residence for the consumptive, it would be incomplete without extending it to the sea side; which, especially on the southern coasts of this island, under the supposition of their possessing a milder and softer air, is so often resorted to. Places of general resort near the sea, as well as most others, are commonly but little raised above its level; and, according to the foregoing principles, should be considered as salutary in consumptive complaints:—but there appears to be some other cause of a counter tendency, whose operation must probably remain in obscurity, which produces in such situations a proportion of disease, greater I believe, than is generally suspected. The evidence upon which this fact is to be determined, is drawn chiefly from other sources

than my own inquiries; but they will be found fully to substantiate one another, and all make the proportion very high. On the eastern coast of America, consumption appears from various authorities collected by Dr. Southey, to be nearly as fatal as in Great Britain. In Portsmouth, New Hampshire, it is asserted that one-fifth of the deaths are produced by this disease. The same proportion occurs at New York;* at Boston the proportion is stated to be very great; while *at the distance of thirty miles from the sea it is much less.* At Carlscrona,† on the south coast of Sweden, the

* Dr. Johnson, in an oration delivered before the Medical Society of South Carolina, in 1807, says, that the deaths from pulmonic diseases at New York, bear a proportion of from one-fourth to one-third of the whole mortality.—*Lambert's Travels in North America.*

† The exact proportion for Carlscrona, as calculated from the tables of M. Nicander, is 2.43 to 1000 of the living: but as the cases enumerated in other places have been confined to those

proportion, although low, is greater than the average for the whole of that country; the proportion for the whole of Sweden and Finland being about one-fifth higher. At Plymouth, in Devonshire, the proportion, according to Dr. Woolcombe's tables, appears to be very high;* and the authority of another

above fifteen years of age, a third of the whole must be deducted on this account, as has been already explained in the instance of Shrewsbury. The proportion will then be 1.62 instead of 2.43.

It is worthy of observation with reference to the small proportion of pulmonary disease at Carlsrona, that the waters of the Baltic, according to the experiments of Dr. Thomas Thomson contain but a little more than one-fifth of the saline matter contained in the Atlantic. What share of influence the proportion of saline ingredients in the water of the ocean can have on that of pulmonary disease on its borders, I do not pretend to conjecture; but the fact is remarkable.

* From these tables it appears, that the proportion of mortality from consumption to that from other diseases, is as 1 to 4.28. Now as the whole mortality is stated to be 640, and the

physician of the same place, is brought by him in proof of the greater prevalence of consumptive complaints in the little towns and villages on the sea side near Plymouth, than in the country at large.

From an accurate return, with which I have been favoured, from the town of Poole, in Dorsetshire, the high proportion of consumptive complaints on the sea coast is further confirmed. By this return it appears, that in a population of 4850, twenty deaths have taken place from consumption during the last year; or 4.12 in a thousand: while in the town of Wimborne,

population 16,000, the proportion of deaths from consumption, to 1,000 of the living will be nearly 9; from which deducting one-third for those under 15, there will remain 6. But as this proportion is taken from Dispensary practice, it is doubtless too high for the general population. It will, perhaps, be near the truth, if we subtract one-fourth of the whole on this account; which will give 3.75 for the true proportion.

only six miles distant, and separated from it by a ridge of low hills, the proportion, as has been already given in the first table, is not quite a half; or only 1.95 in a thousand. Further data may be wanting, on which to found general conclusions, with respect to the comparative prevalence of consumption near the sea; but these facts, as far as they go, are very decisive.

The following table will shew, at one view, the comparative mortality from consumption, in all the places which have been mentioned,

TABLE.

Places.	Population	Mean Elevation in feet.	Number of deaths from Consumption in one year.	Proportion to 1,000 of the living.
Shrewsbury . . .	18,543	Estimated at 400	119	6
Maiden Bradley .	500	750	3	6
Kilminster . . .	600	825	3	5
Poole	4,850	Sea side	20	4.12
Leigh upon Mendip	750	790	3	4
Plymouth	—	Sea side	—	3.75
Hinton	600	580	2	3.36
Ackworth in York ^{e. 1}	728	Unknown	4	3.13
Frome	10,000	450	31	3.10
Horningsham . . .	1,000	650	3	3
All England & Wales ²	—	—	—	2.74
Wells	5,000	50	11	2.20
Wimborne	3,300	50	7	1.95
Carlisle ³	—	Estimated at 100	—	1.92
Glastonbury . . .	4,000	25	7	1.75
Carlsrona	—	—	—	1.62
Wedmore	3,000	50	4.50	1.50
All Sweden and Finland ⁴ }	—	—	—	1.34
Axbridge	1,100	50	—	0.20

(1) Price on Reversionary Payments. The number of inhabi

Setting theory aside then, it appears from the facts which have been adduced, that a low inland situation is by far the most favourable for consumptive patients:—and if with such a situation can be obtained a more equable, and

tants in the parish was 728; the deaths from consumption in ten years ending 1767, thirty-eight, which will make after the deduction of one-third, a proportion of 3.13 to 1,000.

(2) The annual mortality for England and Wales, on an average of ten years ending 1810, appears from Mr. Milne's table p. 437, v. 2, to be about one in 48; from which is deduced 205,000 for the whole mortality. It further appears from Dr. Woollcombe's sixth table, that the proportional mortality from consumption to that from other diseases, may be estimated at about one in five for the whole kingdom; which will give 4.1 as the annual number of deaths from consumption in a thousand of the living; from which deducting one-third, there will be 2.74. But as it is probable, that the rate of mortality which Mr. Milne has taken for the whole kingdom is too low, from causes which will be noticed hereafter, the number of deaths from consumption must be too low also.

(3) Dr. Heysham's Registers.

(4) M. Nicander.

somewhat superior temperature, than that of the general average of this island, we shall possess every local advantage which our climate will afford. Just such a situation is that which I have described, as lying on the southern side of the Mendip hills.* Its geographical position in the south-western part of the island.—The shelter afforded by the range of hills towards the north, and the lowness of its level, while spots may be chosen just sufficiently raised above the marshy lands to escape the prejudicial and chilling influence of concentrated moisture : † without being so high as to

* I find from meteorological observations which I have made for several years at Frome, that the temperature in the winter and spring months, is three degrees higher at that place, than at Althorp, in Northamptonshire, as appears from the register published in the *Journal of Arts*; and about three lower than at Sidmouth, from the tables of Dr. Clarke. Allowing two degrees for the elevation of Frome, there will be a difference of five degrees between Althorp and Wells or Axbridge; and only one between those places and Sidmouth.

† This may be considered a desirable object; and in making

defeat the object in view, point it out as one of the most eligible. To these advantages of a physical nature, may be added others of a more obvious and inviting character. The varied and romantic scenery of the neighbourhood cannot fail to charm those who possess a relish for the beauties of nature; while the tastes and habits of individuals may be gratified in the society of a city, or the seclusion of a village.— There are, doubtless, other situations, em-

choice of a low situation, the immediate neighbourhood of a river, or of wet and marshy ground should be avoided. The precipitation of moisture which takes place in these situations, on any sudden reduction of temperature, is extremely prejudicial to animal and vegetable life; and reduces the temperature much below that of the air immediately above it. I found an hour after sun-set in the month of September, that a thermometer sunk five degrees, when removed from an elevation of 100 feet, and immersed in the fog, which covered to the depth of 20 feet, a river and the adjoining meadows immediately beneath; and I have on other occasions observed, a similar and even a greater difference, when there has been no visible fog.

bracing equal advantages, but I believe them to be by no means numerous. The same level is not often found sufficiently removed from the sea, to escape the injurious effects of the air blowing immediately from it. It is true that several of the eastern counties afford such a level of vast extent: but their situation further to the north, and their unsheltered exposure to the full sweep of the eastern air, renders them objectionable. It is next to impossible that the midland counties should possess such a situation as that desired; while in the southern and western ones, they must be few from the causes which have been assigned. It is a very easy thing for a person not accustomed to such observations, to be misled in this respect. Every situation is not low which appears to be so: it may be low indeed with respect to the land surrounding it, while its actual elevation is considerable. In conversing with medical friends on this subject, it has frequently been objected, that in certain low situations within

their circle of practice, they have found a large proportion of consumptive cases: but these situations, which either as extensive flats, or deep and narrow vallies, when submitted to actual measurement, were found to be at a considerable elevation. The valley, in which the extreme branch of the river Willey, called the Deveril, has its source, in Wiltshire, may be particularized as an instance of this kind. The head of this valley, which is of considerable extent, is bounded on each side by a wall of hills, rising precipitously to the height of 300 feet, which give it its character of a valley, and at the same time give rise to a deceptive estimate of its elevation, for the valley itself is not less than 700 feet above the level of the sea. Wiltshire abounds with similiar situations.

“ Devon’s myrtle vales” may afford favourable situations which combine the advantages to be obtained from elevation and temperature: but many of the favoured resorts of this county

are too near the sea ; and its interior rises rapidly towards the central region of Dartmoor.

The buildings in the neighbourhood of the Bristol Hot Wells are well situated in point of elevation and shelter : but consumptive patients resorting to this place, should confine themselves to the bottom of the hill, and by no means think of residing on his ascent or summit. The disadvantages under which the Hot Wells may be supposed to labour, when compared with the district which has been recommended, will be found in their close vicinity to the river, and to a large city.

Every place which I have had an opportunity of examining, confirms me in the opinion, that situations, uniting all the desired local advantages, are very few ; and in proportion to the difficulty of finding such, should be the value attached to that, whose comparative exemption from consumptive diseases is established upon the

most unequivocal evidence. A salutary retreat may here be found at all seasons of the year, and especially during the winter and spring months, from the mildness of the air, and the shelter afforded by the Mendip Hills; which, like a stupendous wall towards the north and north east, afford an effectual screen to the winds blowing from those points, which, especially in the spring, are generally the most prevalent.

Amongst the causes of pulmonary consumption which may be considered as local, although not strictly so in the sense implied in this treatise, is the breathing a dusty atmosphere: and I consider this a circumstance of so much importance in the choice of residence, that I cannot refrain from offering a few admonitory hints respecting it.

Those who live in large cities, and in the vicinity of public roads, can never be said to breathe a pure air in dry and warm weather.

The clouds of dust which are incessantly raised by the passing throng, and which may be said never to have time to settle 'till some friendly shower allays and fixes them to the ground; from their extreme tenuity pervade every place within their reach, and become the sources of something more than mere inconvenience. I am persuaded that air, however pure it may be at other times, becomes when thus loaded, a powerful cause of irritation and subsequent disease in the lungs. It has been remarked by many accurate medical observers, that hair-dressers, stone-cutters, coal-heavers, workers of flax, feathers, cotton and silk, scythe and needle-grinders, and all those exposed to a powdery atmosphere, are amongst the most liable to consumption of the lungs: and there can be no reason why the heterogeneous particles which are raised in much greater abundance from our streets and roads, may not, at least to tender lungs, be equally injurious. I never meet a stage coach, or open carriage rolling

along a dusty road, and almost invisible from the cloud with which it is enveloped, but I picture to myself the air cells and passages in the lungs of those whom necessity or pleasure may have induced thus to expose themselves, coated in the same manner, though in a less degree, as the outside of their persons, with the probable train of evils arising out of such a condition. That a proportion of dust must, notwithstanding the provisions of nature for its exclusion, be inhaled into the lungs, is inevitable;—that it has any mode of escape from thence, without exciting disease, is not quite so clear,

There is, as is well known, much more travelling in England than in any other country in the world. This, on account of the peculiar construction of our roads, produces much more dust in the road itself and its neighbourhood, than perhaps is common in other countries;—and who will venture to say that

this may not be one, at least of the local, if not of the national causes of pulmonary disease? What must be the state of the lungs in the inhabitant of Knightsbridge and Kensington?

The practical intent of these observations, which would otherwise be a departure from my subject, is to caution the consumptive, and the weakly in general, from residing in dusty streets, or in the neighbourhood of frequented roads in the summer time; and to advise those, who move for change of air, to bear this caution in mind in the choice of residence, and even in their walks and rides. Such a state of the atmosphere as must always prevail in such situations at that season of the year, will counteract every other local advantage.

It would be a curious, and at the same time an useful inquiry, which should be directed towards ascertaining the proportion of pulmonary disease amongst the inmates of the

rows of dwellings which are so absurdly made to line the great avenues to the metropolis. What renders this observation, and the proposed inquiry of more importance is, that in these situations are to be found almost innumerable receptacles for the youth of both sexes, and especially females. Seminaries, academies, and preparatory schools, catch the eye at every step. Let those who voluntarily make choice of such a situation, and fancy that they are living in the country, live there still. But before our children are placed during the most important and most susceptible years of life, within the possible reach of such danger, it were well that both parents and preceptors should look to it.

Temperature, has always been supposed to hold a considerable influence over the rise and progress of pulmonary consumption ; and as it is found to vary in almost every country, and in the same country in different parts and

altitudes, a consideration of it necessarily forms a part of the present inquiry. It is frequently observed that phthisical symptoms, contracted in the winter season in this climate, are suspended during the warmer months; and hence no doubt has arisen the practice of sending consumptive patients to seek relief in southern latitudes; but with what success, the cemeteries of Lisbon, Nice, and Madeira, can best tell. The advantages of a mild and regulated temperature, in every stage of pulmonary consumption, are fully established by the practice of some eminent British physicians: but it would have been worth while before fixing on any foreign stations for the reception of the consumptive, to have ascertained the relative proportion of native disease; and if this be received as the test of their fitness, it will be found that they must yield even to some of the more rugged climates of the north. Dr. Beddoes says, that a physician who resided two successive winters in Portugal, informed

him, that consumption is frequent amongst the natives; and that his observations convinced him of the small efficacy of the climate.* From the cases related by Dr. Canella, and the manner in which they are given, as well as from the observations of other Italian physicians, it would also appear that Italy can lay no claim to exemption from this disease; but that it is on the contrary to be considered as one of the most common disorders of the country. Dr. Irvine, speaking of the prevalence of consumption amongst the natives of Sicily,† says, “It is an ordinary and dreaded disease amongst them.” He says, also, “The symptoms of consumption do not at all differ here from those of the same complaint in England. It runs the same course, is attended with the same fallacious hopes of recovery, and terminates in the same sudden and unexpected manner.”

* Essay on Consumption.

† Observations on the diseases of Sicily,

Neither does the far-famed climate of Madeira appear to possess advantages superior to those of the countries just mentioned. Dr. Beddoes tells us, that he was informed by a medical friend who resided there some months, that scrophula and consumption are by no means uncommon. Two among the British settlers, persons who did not go out as invalids, died of consumption within twelve months; and a resident lady of delicate health fell into the same disorder. "This proportion" says Dr. Beddoes "would be reckoned not inconsiderable even in Britain." Dr. Gordon under whose care some consumptive patients were placed in Madeira by Sir John Pringle and others, discouraged the practice of sending them thither.* Dr. Gourlay says, "It is not to be concealed that no malady is more prevalent here than phthisis with the natives of

* Vide Dr. Reid's treatise on consumption.

the island. Persons of all ages, and both sexes, fall victims to it; nay, whole families have at times been suddenly swept away by it."* Now the serene atmosphere, and the mild and almost uniform temperature of Madeira, would to us, who are accustomed to consider a cold, humid, and variable climate, as the great national cause of the disease, seem to point it out as the most desirable spot for consumptive patients with which we are acquainted: and such seemed to have been the high opinion entertained of it, till sad experience shewed its futility.

There are two reasons founded on the foregoing observations which constitute Madeira, notwithstanding its admirable climate, a very unfit residence for the consumptive. The first

* Observations on the Natural History, Climate and Diseases of Madeira.

is, that the small size of the Island, can afford no spot of moderate elevation, at a sufficient distance from the coast, to escape the too stimulating effects of a marine atmosphere. The second, that the rapidity with which the land rises from the sea shore towards the centre of the Island, precludes the possibility of finding such an one in its interior parts. Some idea of the rapid ascent of the face of the country may be formed, when it is stated, that in an average breadth not exceeding eleven miles, it rises to the stupendous height of upwards of eight thousand feet.

On the other hand, in Russia, where winter reigns with a severity little known to us during half the year, pulmonary consumption, on the authority of Dr. Guthrie, who practised many years in that country, is a rare disease.* In Sweden and Finland there appears a similar,

* Philosophical Transactions, Vol. xlviii.

and as it can be ascertained with greater precision, a more satisfactory exemption: the number of deaths from consumption in that country, being according to the tables of M. Nicander, something less than half of those from the same disease in Great Britain. In Denmark Lord Molesworth says that "few or none of the Danes are troubled with coughs, catarrhs, consumptions, or such like diseases of the lungs,"* which he attributes to the warmth of their stoves and their wood fuel: but in the north of Germany, where the fuel is the same, and great attention is paid to the stoves, the proportion of consumption is nearly or quite as great as in Great Britain.† Even in Lapland, Linnæus speaks of consumption as infrequent.‡ The countries which have been reported to be the most exempt from this

* Account of Denmark.

† Edinbvrgh Medical Journal, No. 7.

‡ Tour in Lapland.

disease, are, Egypt and Bengal: and here I beg to call attention to the topography of these, as well as of those northern countries which have been cited as being also comparatively exempt from it. Egypt, as every one knows, is one vast plain of but very trifling elevation. The same may be said of the extensive plains of Bengal. Sweden is almost an universal flat at a low level. Denmark is the same: and so also are those Russian provinces which are likely to be visited by foreign physicians.

I trust that sufficient evidence has been brought forward to shew that independently of other causes, the prevalence, and fatality of consumption are materially influenced by situation; more especially as regards altitude: and if it be so, little further need be said of the importance of such a fact, or of the advantages which may be made to accrue from an acquaintance with it. The experience and the

improvements of ages have done very little for the cure of this formidable disease; which is still the scourge of our country, and the destroyer of the fairest and most promising of its inhabitants. Whatever view we take of it, it acquires a magnitude and importance peculiar to itself. Other diseases attack indiscriminately all ages; before the social attachments have been formed, or after nature has dissolved them, and the disease comes as the looked-for messenger of fate: but consumption, seizes in its unrelenting grasp, the young, the beautiful, and the intelligent; at a time when the bonds of social connexions are closely tied, and when in the relation of child, parent, or citizen, the loss is the most severely felt.* But

* It appears from registers kept at Chester, Warrington, and Plymouth, that the period between 30 and 40 is that in which consumption most frequently proves fatal; the deaths occurring within that term being equal to all those before thirty, and rather greater than those happening after forty. At the hospital

it is as a growing disease that consumption assumes its most important feature. It has with justice been termed the giant malady of the country; and with fearful, and giant-like strides does it gain upon us. Its rapid and universal increase must strike every humane and reflecting mind with dismay; and excite the best founded apprehensions of its desolating effects on future generations. It appears probable from the calculations of Dr. Woollcombe, that the number of deaths from consumption in Great Britain, have increased one-third within the last century; and that they have now reached the enormous amount of fifty-five thousand annually.

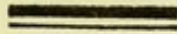
of La Charite, at Paris, in 100 patients who died of consumption, 58 is the age at which the numbers are equal of those who died before and after. I should, however, be inclined to think, that these observations, though true with regard to hospital and dispensary practice, are not applicable generally.

If these things be so; if consumption is proved to be increasing in frequency and fatality; and if it be still found to baffle the united efforts of art and science for its reduction — “Let us not (to use the language of the author just mentioned) vainly hope to find an antidote to its ravages in the hidden stores of nature; but let us rather strenuously seek to ascertain the causes of its extended influence, and endeavour, by all the arts of prevention, to obviate the attack of a foe which prudence may assist us to avert, but no prowess will enable us to overcome.” It is not the design of this treatise to investigate these causes, or the arts of prevention, otherwise than as they are contained in the advantages and preventive checks, to be derived from the influence of local circumstances; and in establishing upon statistical facts the certainty of this influence; and pointing out to the victim of this inexorable disease a place of resort where he may probably obtain a suspension of its ravages;

and to those predisposed to its attacks, or already threatened with them, where, in conjunction with other preventive means, it may be retarded or wholly averted,—I shall have acquitted myself of an important duty; and if the result of my inquiries and observations be supported by those of others, I may think myself happy in having performed a no less important service to a numerous and interesting portion of my fellow creatures. The victim of consumption will in this case no longer be left to the guidance of popular opinion in a matter of vital importance; nor be sent to pant rather than to breathe in elevated situations in search of pure air; nor to the sea side, to inhale an atmosphere which however difficult it may be to account for the fact, appears to be far from salutary. Nor will he find it necessary to fly an exile from his friends and his home to seek a doubtful advantage in a foreign clime; or what is more probable, to die unheeded amongst mercenary

strangers, a speedier victim to his disease, in consequence of the privation of those comforts, and that society, which were essential to his existence;—with no dear friend, who, by a thousand kind offices necessary to his support in this trying situation, can smooth the path to death;—and lastly, without those consolations which the sacred minister of his religion, at this awful period, can alone administer.

PART II.



ON THE

INFLUENCE OF SITUATION

ON THE

DURATION OF LIFE.

strangers, a speaker, victim to his disease, in consequence of the privation of those comforts, and that society, which were essential to his existence;—with **PART II** a flaming kind of office necessary to his support in this trying situation, can smooth the path to death;—and lastly, without those consolations which the sacred minister of his religion, at this awful ^{ON THE} moment, can alone administer.

INFLUENCE OF SITUATION

ON THE

DURATION OF LIFE.

PART II.

HAVING in the preceding pages considered that state of the system where the powers of life are morbidly active, and the resistance opposed to them weak and ineffectual; we come now by an easy transition, to consider the converse of this state; and to inquire what happens in old age, where power is diminished and resistance increased; as well as in debility from other causes, and in convalescence from acute disease; where the vital powers are reduced, and resistance if not absolutely increased, may be considered as relatively excessive.

As life advances, the vigour of its active principle declines ; while mechanical obstructions from various causes, accumulate to oppose its functions, until resistance overbalances power, and life is extinguished. The soft parts grow rigid ; the vessels themselves sometimes become ossified, and their extreme branches obliterated ; the valves of the veins frequently relaxed, or ruptured, cease to perform their office, and the tardy column of blood is with difficulty urged on to complete the circulation. Under such accumulated circumstances of oppression, how great must be the labour which the heart has to perform ! at a time too when the sinking powers of nature require a lightened, rather than an augmented load. The weight of the atmosphere also, which in youth and health serves only to restrain inordinate action, now comes in aid of the other resisting forces, and contributes its share to oppose, and finally to overpower the vital actions. At that point

of life in which the acting and the resisting powers are nearly balanced ; or in which the latter begin to preponderate ; a very slight additional superiority required by either may be followed by important results. If the acquired advantage be in favour of the vital forces—the causes which have been described as opposing their freedom of action, may be for a time averted, or if in a state of incipient formation, be overcome. If the same advantage be on the side of the resisting powers—the effect of the acquired power may be greatly disproportioned to its degree. It may so happen that life is already assaulted by the full amount of force with which it is capable of contending, and a slight increase be sufficient to end the conflict ; and as the causes of mechanical obstruction which have been mentioned as arising from altered organization, do not come within our control, it is of importance to inquire what advantage may be obtained by a due regulation of those which do :—one, and

perhaps the chief of which, is the weight of the fluid which surrounds us.

Enough it is hoped, has been already said in the first part of this treatise to prove that this opinion is not altogether chimerical. Sufficient evidence was advanced to shew that excessive action was induced by diminished, and moderated by increased atmospheric pressure. It might by fair inference be assumed then, that the languid actions of debility, and of old age, may by the same means be either overpowered or invigorated. But the fact of their being so, does not rest on an assumption: the same description of evidence is at hand, and through every region of the globe, we shall find, that distinct from the influence of other physical causes; in climates so widely different as those of Siberia and Peru, the average duration of life corresponds with the elevation of the different countries, or of their respective parts. So

universally does this axiom appear to hold good, that, the general elevation of a country being given, the probable age of its inhabitants may with tolerable accuracy be ascertained; provided they are not given to habits of intemperance, nor visited by any exterminating pestilence. There is scarcely a traveller of observation from whom some fact may not be gleaned in conformation of these remarks. Pallas says, that in Siberia the inhabitants of the mountains, attain a much greater age than those of the plains. Humboldt asserts that the aborigines of the elevated plains of Mexico attain a great age, and that appearances of decay do not come on till very late. The same thing is to be observed in similar situations in Peru. "It is by no means uncommon," he says, "to see in Mexico, in the temperate zone, half-way up the Cordillera, natives, and especially women, reach a hundred years of age. This old age is generally comfortable; for the Mexican and Peruvian Indians preserve their

intiscular strength to the last. While I was at Lima the Indian Hilario Pari died at the village of Chiguata, four leagues distant from the town of Arequipa, at the age of 143. He remained united in marriage for ninety years to an Indian of the name of Andrea Alea Zar, who attained the age of 117. This old Peruvian went at the age of 130 from three to four leagues daily on foot.* It is stated in the *Mercurio Peruviano* published at Lima, that both the Peruvian Indians, and the Creoles are remarkably long lived, and retain their faculties and bodily vigour to a very advanced age. In the small province of Caxamarca, situated in an elevated plain,† between two ridges of the Andes, and containing hardly 70,000 inhabitants, there were eight persons alive in 1792,

* Political Essay on the Kingdom of New Spain, Vol. 1, p. 151.

† Humboldt gives this valley an elevation of nine thousand feet.

whose ages were 114, 117, 121, 131, 132, 135, 141 and 147: and in the same province a Spaniard died in 1765, aged 144, leaving 600 persons lineally descended from him. Dr. Reineggs gives a similar account of the Lesghæes or inhabitants of the higher parts of Mount Caucasus, "where they live to a great age. It even seems to flee from them; for thirty and forty years appear to have no effect on their vigorous constitutions."*

If we turn our eyes to the Continent of Europe, the difference in the proportional duration of life in low and mountainous districts is very striking. Thus in Norway, the annual mortality is one in 48; while in the neighbouring country of Sweden, which has already been described as an almost universal flat, at a low level, the number is one in 34; and in Holland, a still lower level, it is as

* Wilkinson's Mount Caucasus.

high as one in 23. Mr. Townsend, in his travels in Spain, speaking of the Austurias, says, “ Few countries can produce more examples of longevity : many live to the age of one hundred ; some to a hundred and ten, and others much longer. The same observations may be extended to Gallicia, where in the parish of St. Juan de Poyo, A. D. 1724, the curate administered the sacrament to thirteen persons, whose ages together made one thousand four hundred and ninety nine, the youngest of these being 110, and the oldest 127.” The elevated and mountainous character of these provinces is sufficiently known. But in Switzerland, as the most mountainous country in Europe, we should expect to find the theory hold good : and accordingly it is in this country that we find the most remarkable instances of the general duration of life. In some part of the Pays de Vaud, the general mean duration of life is above 45 years ; while following the course of the Rhone, in the Lyonois, it is but

a little above twenty-five years. But the village of Leyzin, in the Alps, affords a still more remarkable example of general longevity: the probability of life in this parish being, according to M. Muret, as high as sixty-one years.

In our own country the difference is equally striking. It is curious to trace the decreasing progression in the mortality of the different counties, as their surfaces increase in elevation. Thus, in Essex, the annual mortality is one in forty-two; in Cambridgeshire, one in forty-three, and in its marshes, one in thirty-three; in Huntingdon, one in forty-seven; in Lincolnshire, one in forty-nine, in its marshes, one in thirty-three; in Wiltshire and Shropshire, one in fifty-five; and in Gloucestershire, it is stated as low as one in fifty-nine. The great and unusual duration of life which this statement gives to the inhabitants of this county, would appear from its

character to be scarcely reconcileable with the theory. But Gloucestershire without presenting the rugged aspect of what might properly be called a mountainous district, possesses a general elevation of inhabited surface superior to any in the southern part of the kingdom of equal extent, or perhaps in any other part. It is here that the Thames has its source ; which is alone sufficient to bespeak its elevation. Rudder in his History of Gloucestershire gives several instances of natives of this county who have reached a great age. Amongst these the parish of Siddington St. Mary, situated in in that part of the county which gives rise to the Thames, affords the most remarkable examples. The rector of this parish, Dr. George Bull, buried ten of his parishioners, whose ages together made one thousand years ; two of whom were one hundred and twenty three years each. It must not be forgotten in estimating the comparative healthiness of this county, that it contains many considerable

towns, and that a large proportion of its inhabitants are employed in the clothing manufacture: circumstances which taken together, must tend to depress the average duration of life; and which consequently place in a still more striking view, the advantages arising from the nature of its surface. The proportion for the whole of Wales is calculated at one in sixty. Cornwall is also stated at one in sixty. If this be correct it must be attributed partly to elevation, and partly to the mildness of the winters in that county.

It is probable that the whole of these calculations deduced from the population returns, give a rate of mortality more apparent than real;—mistakes in the number of the people;—omissions in the registry of burials;—emigrations;—and the numbers in large towns especially, interred in burying grounds belonging to dissenters, are so many causes of error; and will invariably lead to a computed rate of

mortality much below the truth. I know that all these causes have in many places operated to a very great extent. These calculations may however afford a just measure of the relative rates of mortality for the different counties.

With respect to Scotland, the Statistical Account of that division of the Island, might naturally be referred to, to furnish important illustrations of this subject. But "on account of the acknowledged omission in the registers of births, deaths and marriages, in most of the parishes of Scotland," as is observed by Mr. Malthus, "few just inferences can be drawn from them." Sir John Sinclair, however, remarks, that there are more instances of people who have reached to a great age, with the full possession of bodily and mental faculties in Scotland, than in any other country in Europe.

Dr. Lister remarks in No. 165, of the Philosophical transactions, "The vast number of old men and women to be found upon the mountains of England comparatively to what are found elsewhere ;" which he ascribes to the healthfulness of cold. And in another place he says, "I am confident many scores of persons might be found of the age of a hundred years among these northern mountains ;" and it is remarkable, that all the instances he produces of persons who lived from a hundred to a hundred and forty years, were found upon that central range of elevated, and mountainous land, which has been aptly termed the English Appenines, and principally in the district of Craven, from whence different streams proceed, which run through Yorkshire and Lancashire into the eastern and western seas. In No. 310 of the same Transactions, is an account of two remarkable parishes by Mr. Plaxton ; which shall be given in his own words. "Anno 1673," says Mr. P. "I was presented to the

vicarage of Sheriff-Hales, and also to the rectory of Kinnardsey: the former in the counties of Salop and Staffordshire, the other wholly in Shropshire. November 6, I was inducted into the parsonage of Kinnardsey, where I was incumbent for thirty years and upwards. At my induction I found a great many aged people in the parish, upon which I took the number of the inhabitants, and found that every sixth soul was sixty years of age and upwards; some were eighty-five, and some were ninety. This I could not but wonder at, considering that the town was surrounded with a large morass, overflowed in winter, and that you could not come into the parish any way upon arable land."—"As to my rectory of Donington, to which I was presented anno 1690, I found there as many old people as I did at Kinnardsey, if not more; and in the two parishes I had but a difference of three in the number of the people. At Kinnardsey I had one hundred and thirty-five souls, at Do-

nington one hundred and thirty-eight; of the one hundred and thirty-five I had twenty-three aged sixty and upwards; of the one-hundred and thirty-eight, twenty-four.”—“The people here live to great ages; I saw in one house three healthful people, whose ages numbered together made two hundred and seventy-eight, and I think they lived some years after; they were the man and his wife and his wife’s brother.”

“I was at Donington about thirteen years and some months; and in all that time I buried but twenty-seven people, of which number four came from neighbouring parishes, four were young ones, and of the remaining nineteen the youngest was about sixty, and the oldest ninety-six years of age. I was there the fourth legal incumbent in succession from the reformation; and as I remember at one triennial visitation of the bishop we had neither burial or wedding to return into the registry

at Litchfield. The country is very healthful in those parts, and though it seems to the eye of a traveller to be but of a moderate height, yet in riding between Donington and Wolverhampton, which is but five miles, you cross four rills or brooks in the compass of three miles, two of which run into the south-west seas, to Severn and Bristol; the other two hasten to the Trent and Humber, and so into the northern ocean."

I have no means of knowing the exact elevation of these places. The position of Donington, at the sources of two rivers which run a lengthened course into opposite seas, is sufficient to shew that its elevation must be great: and from the situation of Kinnardsey, it cannot be judged much inferior; notwithstanding the morass which Mr. Plaxton found so difficult to reconcile with the facts he was detailing. The localities of this parish are peculiarly instructive; and place in a strong

light the effect of elevation in prolonging life, notwithstanding the existence of causes which have been supposed capable of shortening it. They serve in fact strikingly to shew, that the reasons which have been assigned for the inferior average of life in low, and fenny tracts, are not the only ones.

The annexed table exhibits the results of inquiries made in some parishes in my own neighbourhood. They are deduced from tables of observation for ten, twelve, and eighteen years; and when connected with the peculiar natural situation of the parishes, forcibly illustrate the effect of that situation on the longevity of their inhabitants.—It may here be observed again, that in the estimate of the elevations, the inhabited surface only is included; without regard to elevated points not inhabited; and it will be understood that in each parish there must be inhabited parts at greater elevations than those given in the table.

Thus at Kilmington, the church and a group of houses adjoining, are nearly nine hundred feet above the sea ; and several detached cottages are still higher.

TABLE.

Place.	Population.	Mean Elevation in Feet.	Annual Mortality.	Mean Life.*	Probability of Life.	Number who exceed 70 years of age.
Maiden Bradley	500	750	1 in 45	38½	38	1 in 3.50
Stourton	600	750	1 in 60	42½	45	1 in 3.12
Leigh upon Mendip	750	790	1 in 60	45.8	53	1 in 3.08
Kilmington	600	825	1 in 61	44	48	1 in 2.97

* For the information of those not conversant with such inquiries, it may be stated, that the *mean life* expresses the sum of all the ages equally divided, and is the same as the expectation of life in an infant at birth. The *probability of life* implies the age to which half of the born live.

The parish of Maiden Bradly in which the general duration of life appears to be so much inferior to the others, is perhaps the most instructive for our present purpose of all. The higher rate of mortality, and reduced average of life, depend on the unusual number who perish in infancy; nearly one-third of all that are born dying under two years of age; while in the adjoining parish of Kilmington the proportion who die under the same age, is only one-ninth. This enormous disparity in the mortality of infants in contiguous parishes, bespeaks something wrong in the one in which the excess appears. One is naturally led to expect the existence either of a great degree of moral degradation, or of the most abject poverty; the children must experience neglect from indifference or from want. Yet as if to place in the strongest light the effect of situation in prolonging life, notwithstanding this unfavorable outset, as soon as the dangers and the helplessness of infancy are passed, the child is

likely to attain an advanced age. The probability of life which at birth is only thirty-eight years, at two years of age rises to fifty-five; and the number who exceed seventy is not much inferior to that of the other three parishes.

The expectation of life, at birth, is at

London	Northampton	Holy Cross in shropshire	In the Pays de Vaud.	Maiden Bradley.	Stourton.	Kilmington.	Leigh upon Mendip.
18 Years.	25	$33\frac{1}{4}$	37	$38\frac{1}{2}$	$42\frac{1}{2}$	44	45.8

The dangerous age in elevated situations is the consumptive one; that passed, the probabilities of life will be found not to have decreased in proportion to the increase of years. This age may be supposed to be nearly that which constitutes the probability of life at birth; and will be found at Kilmington to be forty-eight. The inhabitant of this parish

who attains this age, has an equal chance of living to be seventy-seven.

The proportions of one in sixty, and one in sixty-one for the annual rate of mortality in the parishes above mentioned, would not, if taken by themselves, infer any extraordinary degree of healthiness, when compared with the reputed rate of mortality in some other places, and even in whole counties. But such a mode of computation is certainly not to be depended upon. Various causes which have been already enumerated, conspire to invest it with inaccuracies, and to lead to a computed rate of mortality much below the truth. From these sources of error, calculations founded on the probabilities and expectations of life at different ages, and the proportion in a given number who exceed the ordinary age of man, must be free, and their results in all cases correct. I can have no hesitation in saying that the returns which give to whole counties a mortality of

one in seventy, and one in seventy-three, must from some of the causes mentioned, be very far from the truth : and I am confirmed in my suspicions by comparing these counties with their neighbouring ones. It is for instance, quite inconceivable that the rate of mortality for the whole of Cardiganshire should be as low as one in seventy, and according to some, one in seventy-three, while in the adjoining county of Radaor with no obvious cause for such a difference it is as high as one in fifty-five. And it is still more extraordinary that in Glamorganshire, which like Cardigan has a long maritime border ; which like it too from a high and mountainous interior, sinks into a level towards the coast, and with no great difference in the proportion of its town and country population,—I say it is still more extraordinary that there should be found such an enormous disparity as an annual rate of mortality of one in fifty-one. There can be no doubt from the causes before-mentioned, as well perhaps as

from others, that nearly all the calculations framed from the population returns give a rate of mortality much too low. Where such a low rate does really exist, it must depend, not upon a general superior duration of life after a certain age; but on the rearing a greater number of infants; which will often depend on causes not at all connected with the subject of the present inquiry. Thus in the parish of Maiden Bradly where the annual mortality on an average of eighteen years, is as high as one in forty-five, the general duration of life after the first years of infancy, and the number who attain the advanced age of seventy, are nearly as great as in the parishes of Leigh and Stourton, where the rate of mortality is only one in sixty.*

* Since this Treatise has been in the press, Dr. Walker, of Huddersfield, has published an interesting account of the medical topography of that town, in No. 55, of the Medical Repository.

The general duration of life, and the proportion of old people in the parishes given above, are certainly very great, especially at Kilmington, which I should think may vie with most parishes in the kingdom for the health and longevity of its inhabitants. More than a third of all that are born living to exceed seventy years of age, or what may appear still more remarkable, two in seven arriving at the age of seventy five, are examples of general

It appears from a table of mortality, for five years, contained in this account, that the probability of life, at Huddersfield, does not exceed ten years; and the number who attain the age of seventy, is about one in ten and a half: yet, according to the same table, which is taken from the parish register, the annual number of deaths is one in fifty-four only, certainly far below the truth, and affording another proof of the perfect inadequacy of this mode of computation, to give a just measure of the absolute degree of health enjoyed by any particular place; although a tolerable estimate may perhaps be formed in this manner, of the relative healthiness of country parishes, towns, or counties, when compared respectively with each other.

longevity, quite unequalled by any returns which I have met with for any part of this country. As a contrast to this parish, may be given the statements of two parishes in Holland, containing a population of two thousand seven hundred and twenty-eight; in which number there was not one above eighty-five, and only four above eighty.*

From these concurrent reports, collected from different countries, dissimilar in climate, in habits, and in government; the influence of elevation on the duration of life, independent of all other causes, appears to be satisfactorily demonstrated. The great age to which the inhabitants of mountains frequently live, has often been noticed, and has been generally ascribed to the purity of the air in such regions: but the existence of any such difference in the

* Further discoveries concerning the state of the human species, by Nicholas Struyck, published at Amsterdam in 1723.

air of mountains is at the best problematical. The most celebrated chemists have been unable to discover any difference in the component parts of the atmosphere, taken from different situations. Berthollet found the proportions the same in Egypt and in France. Dr. Thomson found them the same at Edinburgh at all seasons of the year: and Gay Lussac examined air brought from the height of twenty one thousand feet above Paris, and found it precisely the same as the air at the earth's surface; nor does it appear that an increased purity of the atmosphere would be so congenial to human life as has been supposed. It is well known, that the effect of inhaling an atmosphere with a superabundant proportion of oxygene, is to produce a state of morbid excitement, and greatly to quicken the circulation. And so, says the hasty objector according to what has been advanced, does a lightened atmosphere: but there is a wide difference between an aided

and a stimulated circulation; between the increased action effected by external and mechanical means, and that produced by internal stimuli. In the one case, the *materia motûs*, (or what is the same thing, the removal of resistance,) is supplied from without, and calls for no additional exertion of the powers of life. In the other, the same motive principle, and the same effect, are to be produced by direct sensorial excitement, and increased labour of the vital powers. In the feverish and inebriating excitement of the one, the powers of life are too quickly exhausted. In the other, they are assisted in their labours, and enabled to maintain them for a longer period.

I cannot better illustrate this part of my subject than by the following quotations from the Croonian Lecture by Dr. Wollaston.

“ The circulation is helped forward by every degree of gentle agitation. The heart is

supported in any laborious effort that may have become necessary, by some obstacle to its exertions; it is assisted in the great work of restoring a system which has recently struggled with some violent attack; or it is allowed as it were to rest from a labour, to which it is unequal, when the powers of life are nearly exhausted by any lingering disorder."—"In the relief thus afforded to an organ so essential to life, all other vital functions must necessarily participate; and the various offices of secretion and assimilation, by whatever means they are performed, will not fail to be promoted during such comparative repose from laborious exertion."—"If vigour can, in any instance be directly given, a man may certainly be said to receive it in the most direct mode, when the important service of propelling forward the circulation of his blood is performed for him by external means. The main spring or first mover of the system is thereby, as it were, directly wound up; and although the several

subordinate operations of so complicated a machine cannot be regulated in detail, by mere external agency, they must each be performed with greater freedom, in consequence of this general supply of power.”

These remarks are *mutatis mutandis*, precisely applicable to our subject; where, if the functions of life are not assisted by a direct supply of power, it is indirectly imparted by the removal of resistance to their freedom of action: labour is lessened, and the same degree of power is thus enabled to act with increased vigour and facility.

We will suppose that in a healthy person, with a weight of atmosphere equal to thirty inches of mercury, the actions of the system, and the resistance opposed to them, are in exact balance. But if a portion of this weight, equal to one inch of mercury,* be suddenly

* About twelve hundred pounds.

taken away ; or, which is the same thing, if we ascend a thousand feet in the atmosphere, there will be an exuberance of power in the vital functions, which will, for a time, be performed with quickened movements and augmented force. It will further follow, that the same change which thus carries the actions of the healthy person too high, will only bring those of the invalid, whose vital force is reduced by recent disease, up to the level of health ; and will be precisely the same thing to him as a positive acquisition of strength, and may materially advance the slow steps of convalescence.* How long it may be before the wonted balance is again restored in the system of the healthy person, it may be difficult to ascertain ; probably not long. The functions of life, in a state of health, quickly adapt themselves to the exigencies of every occasion ;

* The reader will recollect what has been said of the hill of Montmorency.

and in the present case the vital power will soon come to measure its exertions by the scale of resistance, and both regain an exact equilibrium. It does not appear that the pulse of the mountaineer beats any quicker, or that his respiration is more hurried than in the inhabitant of the plain; but the heart has much less labour to perform to maintain the very same actions.

It will readily appear to what use this knowledge is to be applied. Although we can no more controul the fluctuations of the atmosphere than we can those of the sea, we may lessen its weight at pleasure by mounting into higher regions. The convalescent from lingering disease who is seeking advantage from change of air, may derive essential advantage by bearing this in mind, and removing for a time to a more elevated site, provided he has no disease of the lungs. Every one is aware how much the renovation of strength, wasted

by disease, is promoted by exercise, especially of the passive kind. This salutary operation of exercise is the effect of the mechanical aid given to the circulation, by which the heart is relieved for a time of part of its labour; but the weakness may be such, or the season of the year so unpropitious, as to admit of no exercise. In either case, a removal to a higher situation is of still greater importance. The want of exercise is thus remedied, for the same thing takes place without it. The circulation and other functions of the system, are not indeed aided by any direct supply of power; but power is indirectly imparted, as was said before, by the removal of resistance to its freedom of action.

The case of the old man is the same as that of the youthful invalid, with this difference:— that in the one the spring of life is yet unbroken, and the parts of the machine are all in good condition; but in the other there is

no reactive power which can rise superior to the obstacles opposed to it. The main spring is weakened, and the wheels are all clogged, and move heavily. The object here is, by taking off a part of the load, to enable the vital power, enfeebled by the labour of accumulated years, to maintain a little longer the sluggish actions of its worn out machine. A short residence in an elevated place may be sufficient to invigorate the young convalescent; but that of the old man must be more permanent. He may perhaps quit it occasionally for a short time with impunity; but he must consider it as his residence, where nine-tenths of his time are to be spent. Above all, those who have passed the whole, or the greater part of a long life, in an elevated situation, should be cautious of quitting it to reside in a lower one. If lightening the atmospheric load can give fresh vigour to the vital actions, and thus prolong life,—increasing it must necessarily by depressing them shorten

it. The lives of old Parr and John Jacobs soon terminated after quitting their native hills; the one of Jura, and the other of Shropshire.

The difference in the rates of mortality in different countries, has been attributed to the relative proportion which the inhabitants of the country, and of the towns bear to each other: and Sussmilch has gone so far as to fix the rate for every country according to these proportions. The difference in the rate in different parts of the same country, has by common opinion been assigned to causes emanating from certain properties of the soil, or to certain other supposed peculiarities of the air. With respect to the first part of this argument, or as it applies to countries at large, it will be sufficient to compare the two kingdoms of Great Britain and Sweden; when it will be seen that although the proportion of the town to the country population is incom-

parably greater in the first than in the last, the rate of mortality is considerably lower. With respect to the causes more strictly local, or those which produce a disparity in the rate of mortality in different and even adjoining parts of the same country,—those which are supposed to belong to the atmosphere, and to which the superior healthfulness of certain situations has been attributed, have been already examined: and of those which are supposed to emanate from the soil, and whose properties are conceived to be inimical to human life, especially from the soil of marshes, the parish of Kinnardsey, without disputing the existence of such properties, must shake our belief in their sole efficiency to the end assigned: at least in temperate climates. In corroboration of the doubt here expressed, it may be added, that M. Muret, in his inquiries in the Pays de Vaud, found that the duration of life amongst the inhabitants of a low and marshy plain was greatly below that of the

inhabitants of the mountainous parishes. Yet although this plain is low when compared with the neighbouring mountains, as its elevation is considerable, the probability of life amongst its inhabitants is much above that of the Lyonois, consisting of a varied surface but situated at a much lower level.

The preceding observations must of course apply to every description of local insurance, whether in the shape of benefit societies, tontines, or of any other. Dr. Price recommends as a relief to the poor's rate the establishment of parochial societies, under trust of the parish officers, for granting annuities, to commence at a certain age. It is obvious that the calculations upon which these, or any other institutions of the kind must be founded, would differ greatly in different parishes; and I have endeavoured to point out a cause for this difference more certain and general in its application than any of those arising from the

qualities of the soil, or the distribution of the inhabitants. In the great scale on which our Assurance Societies conduct their affairs, the difference is not felt of so much consequence: their calculations being founded on a general average of the whole kingdom, and the defect of life in one district being made up by its excess in another. But if it were otherwise—if the provincial societies were confined in their transactions to their respective divisions of the kingdom—if for instance, the Norwich, and the West of England Societies were limited wholly the one to the eastern, and the other to the western counties, and both were to calculate from the same tables, and consequently to grant insurances at the same rate of premium, a difference in their funds would soon become apparent; and the eventual probability would be, that the one would be able to make a large dividend, and the other become insolvent. As matters stand now, the inhabitants of the west, besides paying for themselves,

assist in paying for those of the east. If a society were formed which should confine its actions to the western and midland counties, that is to say, from the benefits of which the counties of Sussex, Surry, Kent, Middlesex, Essex, Cambridge, Huntingdon, Bedford, Lincoln, Norfolk and Suffolk should be excluded, it could afford to effect its insurances at a rate of premium from one-eighteenth to one-fifteenth lower than at present; or one-sixth below that which another society could possibly effect, confined to the counties above mentioned.

The influence of temperature and of the seasons, bears equally on this, as on the first part of the present inquiry; and a few pages may with propriety be devoted to an examination of the opinions respecting the action of cold on the human body. The popular prejudice in its favour, the fatal error to which a mistaken judgment on this subject may lead,

and the disputed opinions entertained by medical and other writers respecting it, conspire to render it a question of peculiar interest, and its solution of the first importance. The interesting paper of Dr. Heberden, on the comparative mortality of the winters of the years 1795 and 1796; the one the coldest, and the other the mildest, which have been known to occur in this country, placed in a new and forcible light the destructive agency of cold. In January 1795, the whole mortality was nearly twice as great; and the number who died above sixty, five times as great as in the same month the following year. One would suppose that this fact alone would be sufficient to convince the most incredulous on such a subject. But every day's experience tells us that no such conviction has taken place; and there are still not wanting public advocates for the healthfulness of cold. Amongst these is an eminent writer on annuities and assurances; and as the doctrines

advanced by that gentleman on this subject are the most popular, and from their imposing aspect, and the high respectability of the work in which they are conveyed, are calculated to mislead;—I trust no other apology can be necessary for examining the validity of the evidence upon which they rest, and exposing the fallacy of the conclusions drawn from it.

Mr. Milne, in his elaborate work above referred to, has endeavoured to defend the prevailing prejudice in favor of the healthfulness of cold, and supports his opinion chiefly by tables of mortality for all the months of the year, in some of the northern parts of Europe, from which he concludes, that “no support is given to the doctrine which has been maintained of late by some eminent physicians, that frosty weather increases the general mortality;” but that, “they rather seem to favor the opposite opinion which has generally prevailed.” The same form of

tables used by Dr. Heberden are afterwards given, and extended to subsequent years. The increase and diminution in the rate of mortality, with that of the degree of cold which these tables shew, are endeavoured to be accounted for upon other principles. But with the full admission of these principles, the tables themselves still stand as unanswerable arguments for the truth of the position, that cold is unfriendly to human life, especially in the aged.

The following are the results of the tables alluded to :

Years.	Mean temperature of first five weeks.	Whole number of Deaths.	Aged above Sixty.
1794	$37\frac{1}{2}$	2600	473
1795	$26\frac{1}{2}$	2823	717
1796	47	1471	153
1799	36	2204	389
1800	41	3014	699
1801	$43\frac{1}{2}$	2064	380
1802	37	2305	385
1813	$36\frac{1}{2}$	1977	408
1814	29	2149	526

The preceding argument is illustrated by a comparison of the years 1794 and 1796; of which it is observed, that though there was hardly any frost in the first five weeks of 1794, and the price of bread then was only about half what it was in the corresponding part of 1796; the total number of deaths was nearly twice as great; the number that died above sixty was three times as great, &c.— And so it should be; for notwithstanding the absence of frost, there is a difference of almost ten degrees between the average temperature in the same period of the two years, which is nearly the full difference in the winter temperature between London and Lisbon.

It is further contended, and doubtless with truth, that the number of deaths in 1796, especially amongst the infirm, was greatly lessened by the havoc which the cold of the preceding winter had made amongst them, and

there being in consequence fewer persons of that description amongst the living in January 1796 than ordinary. But besides this being a very sufficient acknowledgement of the effects of the cold of that month; to give the argument the weight demanded for it, it should be found to be retrospective also: but the mortality of January 1794, even exceeded that of ordinary winters.

Mr. M. further observes, "It is manifest that the excessive cold in January 1795 increased the mortality considerably, though not so much as has generally been believed; but admitting that an intense frost increases the general mortality, it does not therefore follow that a moderate degree of it, such as we commonly have in England in the depth of winter does so. Our clothing and habitations are only adapted to protect us against the common inclemencies of the weather; therefore when

we happen to be visited by a winter of uncommon severity, many of the people must suffer, not so much because that degree of cold is unfavourable to life, as on account of our houses and clothing being too slight." One should imagine that this supposed difference can only have originated in an unphilosophical idea of the operation of cold. Cold in itself is a negative property; and its effects on the living body are produced only by its conveying away the animal heat. If in the case of an extreme degree of cold the heat is carried off faster than the powers of life can reproduce it, death is speedily the consequence; or in a lesser but longer continued cold, the vital powers gradually sink under the labour imposed on them, and fatal disease, more protracted indeed, but not less certain is the consequence. It matters but little in this view of the action of cold, whether the same quantity of heat is conveyed away by an extreme degree of cold with warm clothing, or by a less severe one with clothes of

a lighter and less defensive quality. In either case, it is equally the action of cold which produces effects unfavourable to life.

The assertion that a moderate degree of cold, such as we experience in ordinary winters in England has no influence on the general mortality, is fully disproved by the invariable results of the bills of mortality in this country, as well as in other parts of Europe. The statements and observations of Dr. Short, Dr. Price, Dr. Heberden, and Dr. Woollcombe, make the proportional mortality of the winter and summer months, in this country and in other parts of Northern Europe, as about thirteen to ten.* And as far as the aged, and indeed all above middle life are concerned, every year shews a progressive decrease in the number of deaths from January to July.

* Summer includes June, July, August, and September. Winter, December, January, February, and March.

The monthly bills of mortality for Sweden, Russia, and England, would seem indeed on a *prima facie* inspection, to warrant the conclusions which have been already noticed as having been drawn from them. By these bills it appears, that the intensity of mortality does not reach its maximum till the severity of cold has passed. The greatest number of deaths in Sweden and Russia being in May, and in England in April; and the fact undoubtedly invests our argument with an apparent difficulty; but it is only apparent. There are several causes whose combined operation will satisfactorily account for the excess of mortality in the spring months, all of which, immediately or remotely owe their birth to the existing or the preceding cold.

Towards the close of winter, and commencement of spring, the cold, although it begins to relent in its severity, may be said to preserve in kind what it loses in degree. It is not till the sun advances high in the ecliptic that

the polar air moves with permanence and velocity southwards: and although its temperature is somewhat raised, its keen severity is much more sensibly felt, and often much more fatal in its effects. This will easily be understood when it is recollected that a heated body cools with much greater rapidity in a brisk wind, than when the atmosphere is calm and of the same temperature; and the human body will experience a much more painful feeling of cold, and will have to furnish a greater supply of caloric in a March wind, with the thermometer ten degrees above the freezing point, than in a still day in January when it is ten below it: neither will its influence be confined to the feelings. The intensity of the application in the one case, exceeds the degree of cold in the other; and more heat will be carried off from the surface of the body under such circumstances, by an equal exposure, with the thermometer at forty-two, than in others at twenty-two. The ex-

treme dryness of these winds, and their rapid subtraction of the moisture, as well as of the heat of the body, increases their cooling power. Dr. Hutton, of Edinburgh, found that a wetted thermometer, exposed to a moderate east wind in the month of March or April, sunk between eight and nine degrees below the temperature of the air: but in the driest summer weather, it never fell more than four, and often only two or three.* But these are not the only reasons why there should be no reduction in the bills of mortality in the spring months in northern climates.

The inhabitants of Russia and Sweden, from whom this argument is principally taken, notwithstanding the greater severity of the cold in those countries, pass the winter months in an average temperature, nearly as high as that of

* Dissertations in Natural Philosophy, p. 153.

the inhabitants of the comparatively mild climate of Great Britain. The Swede and the Russian are at great pains to preserve a regulated, and even a high temperature, in their apartments. But the English stove affords a very scanty and partial heat to a large room; and even if the day has been spent in a room sufficiently heated, the most wealthy not unfrequently retire to sleep in another where it is actually freezing.

Another cause which may be assigned for the increase in the rate of mortality in the spring months is, that the effect of any cause operating upon a living body, is not limited to the duration of the cause itself; and much of the evil effect of cold may not be apparent till its intensity is somewhat on the decline. The long continuance too of severe cold may destroy many who could have resisted it for a shorter season. Now there is very little mitigation in the extremity of the weather in Russia or Sweden till the month of April; and even this

month at St. Petersburg is rather below the average temperature for January in London.

Another cause which acts as a check to any reduction of mortality amongst the aged and infirm in the spring months is, that there is a more general exposure to the cold winds, which in spite of a warm sun, often prevail in these months. Those who have scarcely stirred abroad the whole winter, now think the danger past, and that they may venture out in safety. The brilliance of the light, and the genial feeling of warmth which the sun now diffuses, are with difficulty associated with the idea of a freezing atmosphere. The invalid is tempted forth to meet death in the breeze; and the old man confiding in his strength, throws off, perhaps, his upper garment when he most requires it.

But there is yet another cause, probably more extensive than either of the former,

which swells the bills of mortality in the vernal months with never failing certainty. Excessive cold exerts its unfriendly agency chiefly on the aged and infirm, when the vital powers are reduced. But there are diseases of redundant as well as of defective vitality, which are more frequently called into action with the first increase of heat; while the mortality from diseases of an opposite character, as well as from old age, is all the while diminishing. The registers of any public institution will confirm this remark. It will there be found, that the whole tribe of inflammatory diseases are most frequent, and most fatal, in the spring. Their prevalence is also likely to be proportioned to the degree and continuance of the preceding cold; always more so when this has been great. This is perfectly analogous to what happens in vegetable life; which is most energetic after it has been kept back by severe or long continued cold. The rapid transition from winter to summer, and the

astonishing quickness with which vegetation recovers from its long torpidity in northern climates, is well known.* The small pox, whose ravages are always greatest in the spring and early part of summer, still raged with undiminished violence over the whole of Europe during the period which furnished the registers from which Mr. Milne's tables are constructed; Which is alone in some years sufficient to account for the excess of mortality observed at that season. But the following table exhibiting the expectations of life in different countries enjoying different climates, will shew better than volumes, the influence of temperature on the duration of life.

* Mr. Malthus says, on the authority of M. Krafft, that pleurisies destroy one-fourth and high fevers one-third of the whole population of Petersburg.

TABLE.

Age.	EXPECTATIONS OF LIFE AT THAT AGE.		
	In Sweden.	At Carlisle.	At Montpellier.
60	12.85	14.34	14.59
65	10.19	11.79	12.28
70	8.01	9.18	10.07
75	6.27	7.01	8.05
80	4.85	5.51	6.02
85	3.84	4.12	4.21
90	3.03	3.28	3.76
95	1.76	3.53	3.47
100	—	2.28	2.56

It may be hoped that the facts contained in this table, will set the argument which refers us to the north for instances of health, and longevity, for ever at rest; and that it will, together with the other facts detailed, assist in removing the prevailing prejudice in favour of what is termed a healthy and bracing cold; for which all are ready to contend. The aged

especially, are slow to be convinced that what they have considered as the healthy practice of a long life, can at any period of it acquire a contrary power. Their own invigorated feelings, and the examples of some selected individuals, who, with similar habits have attained an advanced age, are confidently opposed to every description of advice on this subject. But this is the ready argument for every species of habitual imprudence; and can avail nothing against a host of contrary evidence. The powers of life are called into extraordinary exertion to maintain the vital heat rapidly carried off by a cold atmosphere. The effect of this increased action of the vital powers, is to give a delusive feeling of vigour; which if not pushed too far, all is well. Youth may draw largely upon the fund of life; may goad its powers to almost any degree of action, and sustain the rigours of climate with impunity. But it is otherwise with age. The

infant and the old man like exotic plants require the fostering care of the nurseryman for their preservation. The first is not steeled to the inclemencies of its new climate:—the last has expended his powers in contending against them. Exposure to cold may indeed produce grateful and bracing feelings; temporary vigour accompanies them; but life pays the forfeit. They lead not to health and strength, but to exhaustion and death.

This may be considered as the proper place for observing, that although the age of sixty has been taken as that at which the influence of cold becomes most conspicuous, we must go back yet many years to affix the period when cold first acquires a marked destructive power over the functions, and the duration of life. It appears from the bills of mortality, that after the first years of infancy, forty is the age at which the number of deaths begin sensibly

to increase with the accession of cold.* He who has passed that age will do well to bear this fact in mind, and to recollect, that although he experience no sensible decay of vigour, and thinks he may yet rejoice in the strength of his youth,—the insusceptibility, and the impenetrable hardihood of that season, are going by; and if he continues fearlessly to encounter the pelting storm, or northern blast, he may in evil hour have cause to repent of his temerity.

It has already been established as an inference resulting from the preceding inquiries, that the duration of life is proportioned to the

* The bills of mortality for the year 1814 will sufficiently illustrate this fact. The number of deaths between forty and fifty in the first half of that year were, in

January.....228	April .....176
February .....185	May .....136
March .....189	June.....112

elevation of the country or spot inhabited. I trust also that it has been satisfactorily proved, that the action of cold is unfriendly to human life, especially in its advanced stages ; and we come now to derive from this knowledge, a second inference of equal importance ; namely, that the duration of life is also proportioned to the temperature of the country or spot inhabited. The union of these two important deductions leads us to the conclusion which was proposed as the final object of these inquiries ; namely, that the fittest residence for the aged and the invalid, is that, where elevation can be united with mildness of temperature.

Ver ubi longum, tepidasque præbet
Jupiter brumas.

It is evident that we must look beyond our own country, for situations where this object may be obtained through the greater part of the year ; but they are comparatively very few,

whom fortune has gifted with the means of seeking better climates ; and of those few, still fewer will perhaps feel disposed at a late period of life to encounter the inconveniences of a voyage, or a journey, and to quit for ever the scenes and the friends of their youth, to pass the remainder of a lengthened life far from both. Such may seek shelter in the southwestern counties of this island ; whose milder air, and bold elevations, afford an infinite variety of situations answering the object desired ; where with warm houses, and warm clothing, during the inclement season, and the nameless comforts of an English fire-side, which are to be found no where else, the want of a more genial climate need not be regretted. Amongst the situations which together with these advantages, possess in an eminent degree those of society, &c. : the higher parts of Bath and Clifton may be particularized, the former especially ; where on the southern declivity of Lansdown, at an elevation of five or six

hundred feet, there is still a sufficient rise beyond, to form a protection towards the north.

Of all the foreign situations with which we are well acquainted, the Island of Madeira, which has been excepted against as a residence for the consumptive, is perhaps the best; where at an elevation of from one to two thousand feet, (and a greater is perhaps not desirable for a native of England) every advantage of situation and climate may be enjoyed.

I cannot close these remarks, without again expressing a hope, that those who possess the required local advantages, will be at the pains to collect, and to publish, such observations as may throw light on the inquiry here set on foot, as regards the local prevalence of particular diseases; and especially of consumption. Every fact has its weight, and may boast of having its share too, in rescuing from some

portion of suffering, perhaps from death, the devoted victim of a merciless disease. No class of men have such extensive opportunities of doing good as those engaged in the practice of medicine: and it may afford some consolation, and some encouragement to those who are silently, and unostentatiously pursuing their arduous career, that the field of discovery and of improvement is open to all. No one knows what it may fall to his lot to effectuate; or how far the boundaries of his science may be extended by his individual means. The contribution of a single fact, or observation, is worth a volume of theories unsupported by either; and is in reality greater gain to the science of medicine, than can perhaps be said of any other. It may here be said with truth, that, "The conquests of fancy are made in regions which cannot be rendered immediately productive;" but "when the boundaries of the empire of science are enlarged, we can till the territory as it is gained, step by step, and the

harvest heaps itself on the floor of the granary."

I am aware that the habits, and engagements of medical men involved in the daily and nightly whirl of extensive practice, are exceedingly adverse to inquiries not immediately connected with their routine pursuits. But there are no limits set to the operations of an active mind ; and, under every disadvantage, it will command opportunities of effecting its purpose.—It is true, the science of medicine holds out few rewards to its votaries but those of an approving conscience : but let him who feels disinclined for additional exertion, recollect that the time fast approaches when every man's labour shall cease, and life with all its ordinary pursuits, be as " the vapour which appeareth for a little time, and then vanisheth away : " but the labour of the philanthropist, especially of the medical one, ends not thus. "The benevolence of the great,

or the opulent, however eminent it may be, perishes with themselves. The benevolence even of sovereigns, is often limited to the narrow boundary of human life; but the benevolence of knowledge is of a kind as extensive as the race of man, and as permanent as the existence of society." And what benevolence or knowledge can equal in extent or permanence that of medical science, which is of all others unquestionably the most useful? He who has laboured in its service has not laboured in vain. Whither he goes, thither will his reward go with him; and the good which he has effected shall outlive him, though the memory of it be interred with his bones: "Et profecto, si hominibus unquam liceret gloriari, certe de hoc maxime gloriandum esset, tantum scilicet profecisse genus suum, et tam præclarum tamque perenne existere ingenii humani monumentum."

THE END.

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