The rate of mortality in Manchester / by James Whitehead.

THE

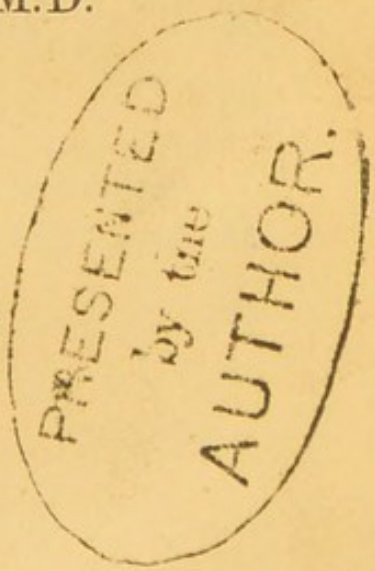
RATE OF MORTALITY

IN

MANCHESTER.

BY

JAMES WHITEHEAD, M.D.



SECOND EDITION,

WITH EMENDATIONS AND ADDITIONS.

LONDON:

SIMPKIN, MARSHALL, & CO., STATIONERS' HALL COURT.

MANCHESTER: A. IRELAND & CO., PALL MALL COURT.

1863.

CONTENTS.

RATE OF

MORTALITY IN MANCHESTER, &c.

In regard to climatic qualities, Manchester bears an unenviable character. Its gloomy atmosphere, charged with unwholesome vapours, the product of numerous furnaces, and its reputed humidity, owing, as alleged, partly to some peculiarity in its geographical position, but chiefly to the heavy falls of rain which are spoken of as being incessant throughout the year, must of necessity render such a locality sufficiently disagreeable ; while the density of its poor population, which is thought to be destructively great, and the pernicious influence of factory employment in more senses than one, contribute to form a combination of circumstances calculated to lead, by logical inevitability to the conclusion, that this town must also be eminently insalubrious as well as uninviting. Indeed, to hear its many grave demerits discussed by strangers

who know it by reputation only, the listener cannot fail of being imbued with the idea that the city of Manchester can only be compared to a gigantic hotbed of pestilential fermentation.

Nor is the imputation altogether discredited by many of its inhabitants, who, unable to refute, are content to accept it as a truth, and to make the most they can out of time and opportunity, with a view to secure their own safety, by placing themselves at a convenient distance from it whenever circumstances shall render such procedure practicable. In cases of sickness, it is by no means uncommon to hear it assumed, as an admitted fact, that perfect restoration must be impossible unaided by removal to another atmosphere. Nevertheless, the great bulk of the inhabitants of Manchester do recover from maladies of severest type within its precincts, unassisted by such auxiliaries; and it does not appear, judging from its rate of mortality, that the public health of this city is much less favourably conditioned than that of many other town communities, even where cotton manufacturing influences are altogether unknown.

It is not hereby intimated that removal from the climate of Manchester, with all the associated advantages of change, is not serviceable to the convalescent. On the contrary, it often proves of the highest value, and in some cases is quite essential; but it is, perhaps, chiefly so in the simple sense

of exchange of the air of the sick room and that of the surrounding locality, with which the system of the patient has, by protracted confinement, become surfeited, for an atmosphere totally different, whether in town or country, and irrespective of any specific virtue supposed to be possessed by that removed to. Neither need imagination stand responsible for the assertion that the Manchester atmosphere not seldom proves as powerfully and as speedily renovating to the convalescent whose malady has for weeks or months held him prostrate amidst the balmy air of the Cheshire meadows, or on the breezy hill-slopes of Cumberland, as the sea-side influence does to one removed from the midst of the town.

It is here purposed to enquire, with the utmost possible brevity, into a few of the principal agencies which render, or are supposed to render, the Manchester populace and its inhabitants generally, unfavourably circumstanced as to sanitary conditions in comparison of those of other towns differing more or less from it in regard to the distribution of social elements, and the character of their several industries.

A smoke-charged atmosphere is undoubtedly objectionable and unpleasant to the senses, and by no means conducive to salubrity; but its influence upon health and the duration of life has probably

been wrongly estimated. They who are most exposed to the direct action of coal smoke, such as engine-stokers, coke-burners, kiln-men, smiths, coal-miners, foundry-men, sweeps, and some others, are among the healthiest and strongest of operatives. It can be shown, moreover, that the inhabitants of some manufacturing towns which are notoriously smoky are, judging from the results of the Registrar-General's tables, more wholesomely conditioned than those of some other first-class towns where the smoke nuisance does not exist. Take for example, the town of Sheffield as compared with York, Wolverhampton with Stafford, and Manchester with Lancaster. Each of these manufacturing towns with smoky atmosphere has a lower death-rate than that of either of its respective county metropolis, which is not so inconvenienced. The average of the collective death-rate of the town populations of Sheffield (73·15), Wolverhampton (67·19), and Manchester (72·71), for the ten years ended 1860, is 71·01; while that for York (74·00), Stafford (83·39), and Lancaster (81·00), is 79·46 (to 100 births), yielding a difference in favour of the salubrity of the manufacturing over that of the aggregate of their respective county towns, represented by 8·45 per cent. Other similar examples will be found in the sequel.

Manchester stands on a soil varying in character in different localities. In the centre and on the north-

east side of the town this is a tenacious clay, while on the south it is chiefly sand or gravel. The whole town is well drained, and liberally supplied with excellent water. The humidity of its atmosphere may be inferred from the actual amount of rain which falls in the space of a year, as compared with the same phenomenon in other localities. The following statement, embodying results for three years in succession, as contained in the elaborate and comprehensive tables of Mr. Symons,* shows the actual fall of rain at the several stations indicated, during the years 1860-61-62, with the elevation of some of these localities above the sea level, and the name of the authority by whom the information is furnished. Of those stations for which the results, for the three years in question, are complete, the average is given in the last column of the tables. It will be seen that the quantity of rain which fell during 1860 and 1862, but especially during the first of these, was much greater, while that in 1861, was below, the general average.

* "English Rain Fall." By G. J. Symons, Esq.

RAIN FALL IN GREAT BRITAIN AND IRELAND.

ENGLAND AND WALES:

DIVISION I.—MIDDLESEX.

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years
		feet.	inches.	inches.	inches.	inches.
Middlesex—						
Chiswick	*Gardeners' Chronicle*	...	30·08	19·48	...	...
Staines	W. Menzies, Esq.	...	...	...	22.79	...
Whitehall	British Met. S. Report	...	27·50	...	...	...
Hammersmith	F. J. Burge, Esq.	12?	...	...	26·64	...
Guildhall	W. Haywood, Esq.	51	28·91	20·87	25·24	25·0
,,	,, ,, ,,	123	...	18·78	24·04	...
Bryanstone Square	C. O. F. Cator, Esq.	...	...	...	27·34	...
Chiswell Street	W. Fletcher, Esq.	...	...	22·85	25·74	...
Mile End	F. Charrington, Esq.	...	...	...	25·50	...
Gray's Inn Road	Mr. R. Strachan	55	...	...	25·67	...
St. John's Wood	Mr. Carter	161	34·60	21·43	28·84	28·2
Camden Town	G. J. Symons, Esq.	100	32·24	22·34	27·57	27·3
Hackney	Dr. Tripe	40	33·10	21·02	29·82	27·8
Finchley Road	G. W. Moon, Esq.	270	...	20·63	...	...
,, ,,	,, ,, ,,	306	...	13·96	...	...
Tottenham	W. D. Howard, Esq.	60	34·37	20·18	26·48	27·0
,, (Vicarage)	Rev. J. S. Winter	...	...	21·41	...	...
Colney Hatch Asylum	Mr. R. G. Rose	...	...	...	26·97	...
Enfield Vicarage	Rev. J. M. Heath	140	34·57	20·02	26·41	27·0

DIVISION II.—SOUTH-EASTERN COUNTIES.

Surrey—						
Godalming (Dunsfold)	W. L. Woods, Esq.	...	...	24·04	25·10	...
Red Hill (Ham)	J. G. Marriage, Esq.	...	34·75	24·15	29·84	29·5
Wonersh (Bramley)	W. L. Woods, Esq.	...	38·14	...	...	...
Dorking (Kitlands)	D. D. Heath, Esq.	580	40·07	30·51	32·22	34·2
,, (Deepdene)	Mr. J. B. Whiting	...	37·43	27·38	29·95	31·5
,, (Denbies)	Mr. J. Drewett	600	...	25·22	...	...
Betchworth (Brockham)	W. Bennett, Esq.	130	33·12	24·78	29·48	29·1
,, (The Holmes)	E. T. Bennett, Esq.	300?	...	25·97	32·10	...

DIVISION II.—SOUTH-EASTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
Surrey—*(Cont.)*						
bbham	Miss Molesworth	110?	31·57	20·77	26·26	26·20
eybridge Heath	W. F. Harrison, Esq.	120	36·33	21.05	27·29	26·22
ew Observatory.....	Balfour Stewart, Esq.	18	28·72?	18·86	28·29	25·29
andsworth (S. Fields)	R. Coleman, Esq. ...	...	...	...	28·48	...
„ (St. Ann's Hill)	G. Dines, Esq.....	58	32·86	...	29·03	...
lapham	H. Doxat, Esq.	...	...	...	26·32	...
attersea	Rev. S. Clark.....	13	28·26	21·96	27·89	26·04
Kent—						
over	H. J. Poulter, Esq...	16	36·25	28·41	24·93	29.86
aplehurst (HuntonCrt.)	Mr. P. Goddard	...	30·38	21·69	26·05	26·04
„ (Linton Park)	Mr. J. Robson.....	...	33·66	24·01	26·93	28·20
nbridge.....	Dr. Fielding	125	31·43	23·11	27·62	27·39
aidstone...	J. H. Baverstock, Esq.	60	33·65	23·91	26·16	27·91
elling (Bexley Heath)	H. S. H. Wollaston	...	28·72	20·16	26·08	24·99
reenwich Observatory	J. Glashier, Esq.....	155	32·00	20·40	...	...
„ „	„ „ „	177	...	16·10	...	...
„ „	„ „ „	205	...	12·90	...	...
even Oaks (River Hill)	J. Rogers, Esq.	520	...	...	29·31	...
est Wickham	Rev. J. T. Austen ...	...	...	...	30·41	...
Sussex—						
ognor (Aldwick)	W. L. Woods, Esq...	...	29·40	21·20	25·48	25·36
righton	Dr. Kebbell	50?	...	...	28·80	...
orthing..... ..	Dr. Barker	10	34·32	29·08	...	...
horney Island.....	W. L. Woods, Esq...	...	33·14	24·12	...	...
est Thorney	F. Padwick, Esq. ...	10	...	...	24·72	...
hichester Museum	W. Hills, Esq.....	20	37·44	25·15	27·47	30·02
„ (Funtington)	W. L. Woods, Esq...	...	35·50	22·28	26·76	28·18
„ (West Dean)	H. Paxton, Esq.....	250	48·94	30·79	36·11	38·61
„ (Shopwyke)	Rev. G. H. Woods...	72?	37·51	23·78	27·15	29·48
ewes (Glynde)	C. L. Prince, Esq. ...	...	40·30	...	...	...
astings (Bleak House)	J. Banks, Esq.....	80	34·25	...	...	...
„ (H. Wickham)	E. Field, Esq.....	212	32·66	24·86	22·82	26·78
„ (Cemetery) ...	J. C. Savery, Esq. ...	450	...	...	30·11	...
„ (39 Tower) ...	„ „ „ ...	...	33·45	...	...	...
t. Leonards (Marina) ...	„ „ „ ...	10	30·77	29·29	22·96	27·67
airlight	J. Rock, Jun., Esq...	498	29.54	29·15	27·18	28·62
lindon.....	Rev. M. A. Smelt ...	190	44·06	28·18	32·07	34·77
rundel (Dale Park) ...	W. L. Woods, Esq...	316	45·09	24·11	34·20	34·47
hilgrove	„ „ „ ...	284?	43·50	28·67	32·35	34·84

DIVISION II.—SOUTH-EASTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Aver for 3 ye
		feet.	inches.	inches.	inches.	inche
Sussex—*(Cont.)*						
Battle	F. Webster, Esq. ...	...	...	...	32·47	..
Hurstpierpoint	Rev. J. Gorham	120	...	27·74	28·74	..
Uckfield	C. L. Prince, Esq. ...	200	42·46	28·35	30·01	33·(
Newick (Beechland)	,, ,, ,, ...	...	...	...	30·31	...
Buxted Park	,, ,, ,, ...	...	45·55	...	29·84	...
Maresfield (Rectory) ...	,, ,, ,, ...	250	40·70	30·25	30·59	33·(
,, (Forest Lodge)	,, ,, ,, ...	300	39·02	27·56	31·05	32·(
Fair Oak (Rogate)	W. L. Woods, Esq...	...	44·58	28·57	34·91	36·(
Petworth	,, ,, ,, ...	...	...	...	29·31	...
Cuckfield (Balcombe Plc.)	J. A. Hankey, Esq...	340	...	...	34·12	...
Crawley	E. S. Bigg, Esq.	300	47·63	34·25	38·13	40·(
Hampshire—						
Ventnor (Isle of Wight)	Dr. Martin	150	36·18	27·29	...	...
Ryde (Isle of Wight) ..	B. Barrow, Esq.....	110	36·28	...	...	...
Osborne (Isle of Wight).	Mr. J. R. Mann.....	172	37·24	25·89	30·65	31·2
Bournemouth	Dr. Falls.....	30	...	...	27·99	...
Fareham	H. Sharland, Esq. ...	26	42·00	63·00	32·40	35·(
,,	R. Porter, Jun., Esq.	8	...	29·16	28·02	...
Lyndhurst	C. L. Prince, Esq. ...	...	32·86	...	30·28	...
Southampton (Ordnance Survey Office)	Col. Sir H. James, R.E.	75	44·05	29·85	34·01	35·9
,, ,, ,,	,, ,, ,,	94	35·71	24·73	26·68	29·(
,, (Gas Works)	Mr. J. Sharp	20	29·56	21·49?	...	...
,, (Eling House)	W. C. Spooner, Esq.	...	...	...	27·17	...
Petersfield	W. L. Woods, Esq...	...	53·07	34·42	38·13	41·(
,,	Rev. M. A. Smelt ...	200	48·64	33·71	35·77	39·3
New Alresford	B. Fielder, Esq.	...	...	27·01	32·46	...
Itchen Abbas	Rev. W. W. Spicer...	...	39·30	25·07	27·70	30·(
Selborne (The Wakes) ...	T. Bell, Esq.	400?	42·05	30·40	33·12	35·1
Andover (Abbotts-Ann)	Rev. F. H. White ...	177	30·17	22·50	25·42	26·(
Aldershott	J. Arnold, Esq.	325	33·42	22·54	25·88	27·2
Berkshire—						
Sandhurst	Sergeant Grose	246	29·84	...	25·74	...
Maidenhead (White Waltham)	J. Silver, Esq.....	...	28·84	...	...	...
Windsor	Hon. Maj.-Gen. Hood	...	...	...	25·66	...
Wallingford (Moulsford)	Mr. J. B. Spearing...	200	...	20·76	27·60	...
Abingdon (L. Wittenham)	Rev. J. C. Clutterbuck	170	30·69	22·67	29·79	27·7

DIVISION III.—SOUTH MIDLAND COUNTIES.

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
HERTFORD—						
tford	R. Littleboy, Esq. ...	250?	35·00	20·19	26·79	27·33
„ (Watford House)	R. Clutterbuck, Esq.	...	...	...	27·52	...
„ (Eastbury)	D. Carnegie, Esq. ...	...	...	...	27·30	...
ddesdon (Field's Weir)	N. Beardmore, Esq.	82	...	21·98	25·72	...
rhambury	Mr. Bogue	...	34·08	22·13	29·16	28·46
melhempstead	J. Dickinson & Co...	250	34·22	21·20	27·44	27·62
rkhampstead	W. Squire, Esq.....	370	36·24	24·10	29·50	29·95
tchin.....	W. Lucas, Esq.	...	...	...	22·52	...
yston	H. Wortham, Esq....	367	29·56	19·81	23·93	24·43
BUCKS—						
rtwell House	Mr. Horton	250	31·45	19·43	25·29	25·39
rtwell Rectory.....	Rev. C. Lowndes ...	290	28·21	17·11	21·58	22·30
OXFORDSHIRE—						
ford (Rose Hill)	Rev. J. Slatter	270	25·39	26·80	...	...
„ (Radcliffe Observ.)	Rev. R. Main.....	208	31·01	23·40	27·42	27·16
„ „	„ „	230	26·88	20·29	23·39	23·52
nbury (High Street)...	T. Beesley, Esq.....	350	31·92	22·34	27·51	27·26
„	J. Jarvis, Esq.....	340	31·56	22·09	26·27	26·64
„	W. Johnson, Esq. ...	...	...	21·34	23·65	...
„ (Neithrop).....	T. Beesley, Esq.....	470?	...	...	28·76	...
NORTHAMPTON—						
horp House	*Northampton Mercury*	...	25·20	20·76	24·21	23·39
llingborough	Mr. M. Sharman ...	...	29·41	23·75	27·00	26·72
ndle	G. Ellick, Esq.	124	..	20·45	22·43	...
erborough (Marholm)	Rev. R. S. C. Blacker	...	33·09	25·22	...	...
HUNTINGDON—						
sworth Hall	H. M. Kaye, Esq....	...	...	...	21·89	...
rith	Mr. J. Brown, Jun.	...	...	...	17·21	...
BEDFORD—						
burn (Aspley)	Rev. G. W. Mahon...	460	31·23	23·29	26·52	27·01
rdington	Mr. J. B. McLaren	...	25·08	19·02	22·02	22·04
„	„ „	104	...	...	17·64	...
lford	Dr. Barker.....	631	24·95	18·43	20·95	21·44
CAMBRIDGE—						
ton (Ashdon)	Rev. J. T. Walker...	...	29·08	18·54	...	..
bourne.....	Rev. J. H. Usill.....	...	...	...	24·10	...
nbridge	J. Nutter, Esq.	50	...	...	23·86	...
sbeach (North Brink)	Mr. A. Peckover ...	11	30·86	22·19	20·73	27·93
„ (Observatory)	„ „ ...	8	...	21·26	21·30	...
„ (Mid-level S.)	„ „ ...	...	...	19·98	23·26	...

DIVISION IV.—EASTERN COUNTIES.

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Aver for 3 ye
		feet.	inches.	inches.	inches.	inche
Essex—						
Leyton	Mr. Donald	93	...	20·41	...	...
Epping	H. Doubleday, Esq.	360	37·03	20·42	25·86	27·7
Witham (Dorward's Hall)	H. Dixon, Esq.	20	26·08	18·83	21·78	22·2
Colchester (Frating)	Rev. R. Duffield	...	29·70	16·59	...	...
Dunmow	H. E. Cockayne, Esq.	100?	28·93	17·17	22·81	22·7
Braintree (Bocking)	S. Tabor, Esq.	200?	31·42	19·81	24·14	25·1
Suffolk—						
Grundisburgh	P. Harris, Esq.	...	...	17·46	24·61	...
Bury St. Edmunds	E. Skepper, Esq.	...	31·62	19·50	23·48	24·4
,, (Beech Hill)	H. Turner, Esq.	...	...	...	26·35	..
,, (Botanic Gardens)	E. Skepper, Esq.	...	...	...	26·13	..
Westley	Mr. R. Burrell	...	30·36	17·71	24·83	24·3
Barton	E. Skepper, Esq.	...	...	20·70	...	..
Thwaite	Mr. O. Whistlecraft	150	36·60	23·62	28·81	29·4
Thurston Lodge	Rev. W. Steggall	...	29·43	17·46	24·81	23·9
,, (Nether Hall)	W. C. Bassett, Esq.	...	29·45	18·98	24·04	24·1
Barton Hall	Mr. W. Allen	...	...	...	23·87	..
Culford	Mr. P. Grieve	...	...	19·51	23·78	..
Norfolk—						
Diss	Dr. Stewart	115	...	19·75	23·25	..
Thetford	Dr. Bailey	75	...	...	16·78	..
Norwich	W. Brooke, Esq.	30	34·47	24·80	22·26	27·1
Fakenham (Egmere)	R. Overman, Esq.	150?	31·38	24·82	23·92	26·7
Burnham	H. E. Blyth, Esq.	102	34·65	24·78	26·71	28·7
Holkham	S. Shellabear, Esq.	39	34·69	21·80	22·72	26·4
,,	,, ,,	43	31·58	20·78	22·87	25·1

DIVISION V.—SOUTH-WESTERN COUNTIES.

Wilts—						
Salisbury (Alderbury)	W. L. Woods, Esq.	...	34·12	25·14	26·80	28·0
,, (Baverstock)	Archdeacon Honey	...	37·45	26·75	30·30	31·5
Warminster (Longbridge Deverill)	Rev. J. Slatter	...	40·32	25·52	38·69	34·8
Chapmanslade	F. Singer, Esq.	...	40·31	...	...	.

DIVISION V.—SOUTH-WESTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
Wilts—*(Cont.)*						
arlborough	W.C. Merriman, Esq.	...	...	28·90	31·22	...
alne (Castle House) ...	Major Ward	321	...	23·81	33·27	...
„ „ ...	„	348	...	22·26	33·33	...
ippenham (Badminton)	Mr. J. Trotter	...	...	...	33·14	...
Dorset—						
ortland	J. T. Leather, Esq...	52	30·77	22·07	26·22	26·36
areham (Encombe) ...	O. W. Farrer, Esq...	150	42·65	32·49	34·79	36·64
ttle Bridy	H. S. Eaton, Esq. ...	348	49·04	37·23	37·22	41·16
idport	A. Stephens, Esq. ...	95?	36·63	29·67	32 12	32·81
etherbury	Rev. C. B. Mount ...	50?	42·37	36·04?	34·80	37·74
rde Abbey	Captain Miles.....	...	...	32·91	37·71	...
Devon—						
ingsbridge	Mrs. L. Harris	143	42·44	34·30	...	...
ymouth (Ham)	Rev. C. T. Trelawny	94	55·58	39·23	46·75	47·19
deford Parsonage	Rev. T. Hullah	75?	...	...	43·89	...
ltram Gardens	Mr. J. Snow	96	57·58	41·69	46·92	48·79
ympton St. Mary (Ridgeway)	Miss B. T. Phillips...	116	62·39	42·98	51·95	52·44
ybridge (Torrhill).....	J. Widdicombe, Esq.	260?	54·31	42·25	50·49	49·02
ympton St. Mary (Goodamoor).....	H. H. Treby, Esq. ...	580	72·02	53·66	63·14	62·94
ckland Monachorum (Crapstone)	„ „ ...	500	65·85	...	...	...
e Moor	„ „ ...	900?	...	...	74·57	...
ckfastleigh (Hawson)	R. T. Abraham, Esq.	350	...	...	74·45	...
rquay	E. Vivian, Esq.	150	36·36	22·74	...	...
ighwick	Dr. Barham	300?	48·02	34·45	40·45	40·97
artmoor	Dr. Roome	1380	63·88	...	93·51	...
eignmouth	Dr. Lake.....	60	...	22·20	...	...
„ (Westbrook)	Miss K. T. Clark ...	25	40·35	30·36	34·61	35·11
vistock Institution ...	W. Merrifield, Esq...	298	47.99	34·45	37·85	40·09
ilton Abbot (Edgecumb)	H. Clark, Esq.	...	48·72	39·49	52·02	46·74
awlish	P. J. Margary, Esq.	62	40·88	29·97	32·16	34·34
vey Tracey	J. Divett, Esq.	100	49·82	36·73	42·38	42·98
mouth	E. Divett, Esq.	200?	38·37	28·04	31·83	32·75
agford	R. L. Berry, Esq. ...	650	...	...	56·65	...
isthydon	Rev. J. Huyshe	200?	41·53	25·21	30·93	32·56
oniton (Overday)	R. T. Abraham, Esq.	700	...	...	46·04	...
roadhembury	Rev. W. Heberden...	...	42·62	28·52	36·77	35·97

DIVISION V.—SOUTH-WESTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years
		feet.	inches.	inches.	inches.	inches.
Devon—*(Cont.)*						
Exeter (Albert Terrace)	R. Dymond, Esq. ...	160	...	27·96	31·81	...
„ „	W. Vicary, Esq.	140	...	28·02	...	...
„ (St. Leonard's)...	„ „	140	...	...	31·40	...
„ „ ...	„ „	160	...	...	27·45	...
„ (High Street) ...	W. H. Ellis, Esq. ...	170	36·26	27·92	27·75	30·64
„ (Institution).....	Mr. Parfitt	155	36·08	25·80	29·58	30·49
„ (St. Thomas) ...	W. Vicary, Esq.	50	42·17	28·33?	...	...
Tiverton	W. H. Gamlen, Esq.	400?	55·41?	33·55	42·72	43·89
S. Molton (Meshaw Rect.)	Rev. W. H. Karslake	472	...	...	45·02	...
Huntsham Court	Miss A. Troyte	584	62·32	39·96	45·66	49·31
S. Molton (Castle Hill)	Mr. A. Saul	160	57·46	41·19	48·86	49·17
Barnstaple	T. Mackrell, Esq. ...	31	50·14	37·15	43·78	43·69
Cornwall—						
Helstone	M. P. Moyle, Esq. ...	110	42·96	37·62	38·43	39·67
Penzance	W. H. Richards, Esq.	94	49·25	40·98	44·64	44·96
Redruth (Tehidy Park)	Mr. H. Beddard.....	100	48·63	40·56	45·70	44·99
Truro	Dr. Barham	56	50·06	39·98	44·65	44·89
Newquay	Lieut. Liddell, R.N.	90	...	...	38·62	...
Bodmin	„ „	300	56·33	44·56	47·36	49·42
„ (Warleggan) ...	Rev. D. Clements ...	800	67·05	48·96	55·61	57·21
„ (Pencarrow) ...	Mr. H. Jones	230	51·61	45·32	47·81	48·25
Wadebridge (Treharrock House)	F. B. Hambly, Esq.	200?	46·14	36·65	41·04	41·28
Padstow (S. PetrocMinor)	H. H. Treby, Esq....	96	47·40	44·69	...	...
Port Isaac (Rosecarrock)	Mark Guy, Esq.....	180	44·33	38·63	42·27	41·74
Camelford.....	Lieut. Liddell, R.N.	...	68·04	...	54·63	...
Somerset—						
Taunton	Dr. Gillett	50?	32·62	26·77	27·32	28·90
Long Sutton.....	R. Palmer, Esq.....	170?	31·92	25·81	28·22	28·65
Bridgewater	A. Haviland, Esq. ...	45	29·53	...	...	...
Glastonbury (Street) ...	J. Clark, Jun., Esq.	100	...	25·96	32·22	...
„ „ ...	W. S. Clark, Esq. ...	100?	36·15	23·66	30·08	29·96
Frome (North Hill).....	Mr. J. Boycott	...	38·90	27·17	35·01	33·69
„ (Mells)	Mr. M. Raynes	300	46·57	31·98	48·86	42·47
Axbridge (Sidcot)	H. Dymond, Esq. ...	250?	43·17	31·13	35·18	36·69
Bath	C. S. Barter, Esq. ...	150	44·67	34·02	48·19	42·29
„ (Batheaston)	A. Mitchell, Esq. ...	226	...	...	29·61	...
„ (Swanswick)	Rev. F. Lockey	...	...	...	26·52	...
Bristol (Brislington).....	Dr. Fox	181	...	...	35·94	...

DIVISION VI.—WEST MIDLAND COUNTIES.

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
GLOUCESTER—						
Bristol Institution	The Secretary.....	98	42·96	29·59	...	...
Clifton	W. C. Burder, Esq.	192	40·80	31·31	32·87	34·99
, ...	,, ,,	242	35·52	27·39	28·61	30·51
Cirencester	T. C. Brown, Esq....	446	36·94	27·39	32·46	32·26
Gloucester (Quedgeley)...	J. C. Hayward, Esq.	100?	...	...	29·96	...
,, (The Spa) ..	A. Price, Esq.	50?	27·99	21·30	26·86	25·38
,, (Asylum) ...	Dr. Williams	100	28·01	21·83	28·08	25·97
,, (Twigworth)	W. B. Clegram, Esq.	50?	28·48	20·16	...	...
HEREFORD—						
Hacklands	*Hereford Times*	...	40·77	...	...	...
Leominster (Leysters) ...	W. L. Woods, Esq.	...	...	26·53	29·09	...
,, (West Lodge)	E. P. Southall, Esq.	240?	...	...	29·09	...
SHROPSHIRE—						
Bobury-Mortimer	Mr. W. Hunter	700	...	26·28	28·83	...
Hollow (Knowbury) ...	Rev. J. B. James ...	1000	37·87	27·92	30·55	32·11
Linal (Haughton Hall)	Rev. J. Brooke	450?	31·23	23·80	25·70	26·91
Shrewsbury	Marshall & Co.	192	20·80	16·60	17·10	18·17?
Westry (Whittington)	Mrs. Loyd	..	37·90	27·25	...	...
,, (Hengoed) ...	Rev. A. R. Lloyd ...	...	45·51	30·90	34·68	37·03
STAFFORD—						
Hampton (Wrottesley)	Mr. J. Hough	532	31·37	24·79	28·14	28·10
,, ,,	,, ...	532	30·49	24·70	26·61	27·27
,, ,,	,, ...	553	25·68	21·29	...	...
Tilk.....	R. Farrow, Esq.....	...	46·60	36·40	28·99	37·33
WORCESTER—						
Worcester.....	S. Marshall, Esq. ...	...	39·07	23·42	32·30	31·59
,, (Lark Hill) ...	W. Burgess, Esq. ...	160	...	...	30·44	...
Malvern	T. H. Davis, Esq. ...	200	36·89	29·81	34·31	33·67
Northwick Park	Lord Northwick.....	...	...	...	30·20	...
Malvern	Dr. Williams	450	...	...	23·37	...
WARWICK—						
Edgmington	S. U. Jones, Esq. ...	195	...	...	27·09	...
Ingeleigh Abbey.....	Mr. T. Bowick	...	31·24	22·64	25·95	26·61
Rugby	F. Fuller, Esq.	...	27·54	20·82	25·19	24·52
Wolvebaston	W. Southall, Esq. ...	...	...	...	32·86	...
Birmingham(Bloomsbry.)	D. Smith, Esq.	340	35·16	29·81	31·28	32·08
,, (Camp Hill)	T. L. Plant, Esq. ...	416	35·66	29·31	28·62	31·19

DIVISION VII.—NORTH MIDLAND COUNTIES.

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			Aver for 3
			1860	1861	1862	
		feet.	inches.	inches.	inches.	inc
Leicester—						
Wigston	T. Burgess, Esq.	...	31·47	23·20	26·13	26
Leicester	Mr. J. Payne	...	24·99	...	...	
,,	Mr. H. Billson	...	...	17·62	27·24	.
Thornton Reservoir	J. Bevins, Esq.	...	29·66	25·53	28·14	27
Loughborough (Rothley)	Rev. R. Burton	310?	...	22·46	25·58	.
Waltham Rectory	Rev. G. E. Gillett	540?	...	...	23·95	.
Belvoir Castle	W. Ingram, Esq.	237	29·23	22·12	23·35	24
Rutland—						
Empingham	Mr. W. Fancourt	...	23·52	15·42	...	.
Lincoln—						
Stamford (Greatford Hall)	Captain Peacock	...	...	...	20·53	.
Wytham-on-the-Hill	General Johnson	...	26·33	19·81	20·62	22
Grantham	J. W. Jeans, Esq.	179	29·67	20·51	21·55	23
Boston	W. Veall, Esq.	...	30·69	20·38	19·93	23
Sleaford (South Kyme)	Rev. H. S. Newcatre	9	31·73	21·65	20·45	24
Lincoln (Coleby)	Rev. T. T. Penrose	...	26·38	17·33	...	.
,,	M. S. & L. R. Co.	26	27·15	16·97	20·31	21
Gate Burton	,, ,,	96	...	21·24	23·53	.
Market Rasen	,, ,,	100	28·79	24·04	21·31	24
Gainsborough	,, ,,	76	29·31	19·55	21·36	23
,, (Spring Gardens)	T. Dyson, Esq.	38	29·75	19·81	20·49	23
Stockwith	M. S. & L. R. Co.	21	26·46	18·25	19·71	21
Brigg	,, ,,	16	29·27	22·48	23·02	24
Grimsby	,, ,,	42	22·29	18·26	17·34	19
Barnetby	,, ,,	51	27·04	21·15	22·10	23
New Holland	,, ,,	18	28·48	20·73	21·62	23
Notts—						
Highfield House	E. J. Lowe, Esq.	162	35·88	22·33	23·88	27
,, ,,	,, ,,	187	28·71	20·01	21·48	23
Beeston Meadow	,, ,,	100	...	...	26·00	
Southwell (Oxton)	H. Sherbrooke, Esq.	...	...	...	20·45	
,,	Dr. Calvert	200?	...	...	19·56	
Newark (Stubton)	G. Nevile, Esq.	...	...	...	22·97	
Welbeck	Mr. Tillery	...	30·54	24·16	22·77	25
Worksop	M. S. & L. R. Co.	127	30·61	20·41	21·46	24
Retford	,, ,,	52	28·13	19·73	22·15	23
,, (East)	*Doncaster Chronicle*	...	28·13	19·56	22·69	23
,, (West)	Rev. C. D. Butterfield	50	28·20	19·31	22·62	23

DIVISION VII.—NORTH MIDLAND COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
DERBY—						
veridge	Hon. & Rev. O. Forester	270	...	...	29·00	...
by	J. Davis, Esq.	179	32·77	22·01	26·28	27·02
tsworth	Mr. A. Stewart	404	...	31·32	30·61	...
sterfield	M. S. & L. R. Co.	248	29·54	25·48	26·34	27·12
wood	,, ,,	238	27·66	24·15	25·21	25·67
abs Moss	,, ,,	1669	53·00	38·33	55·81	49·05
, Reservoir	,, ,,	710	54·17	45·64	53·30	51·04
pel-en-le-Frith	,, ,,	965	44·99	37·19	41·91	41·36
odhead	,, ,,	939	66·35	49·64	48·51	54·85

DIVISION VIII.—NORTH-WESTERN COUNTIES.

HESHIRE—						
ley Minns	M. S. & L. R. Co.	1210	36·21	28·65	34·19	33·02
, Reservoir	,, ,,	590	34·03	27·76	37·59	33·13
clesfield	W. Jeffery, Esq.	500	39·88	32·03	36·97	36·39
,,	M. S. & L. R. Co.	539	38·64	30·69	38·82	36·05
dsham (Kingsley)	Rev. R. Tyas	208?	...	29·11	37·20	...
laston	T. Waring, Esq.	...	...	...	27·04	...
lington (Spond's Hill)	M. S. & L. R. Co.	1279	48·61	37·99	43·61	43·40
aley	,, ,,	602	46·84	37·00	44·08	42·64
ndforth (Quarry Bank)	J. Henshall, Esq.	295	...	...	35·40	...
rthwich (Thelwall)	J. Atkinson, Esq.	96	..	28·93	35·84	...
rple (Aqueduct)	M. S. & L. R. Co.	321	39·87	33·55	40·41	37·94
, (Top Lock)	,, ,,	543	29·28	31·40	41·22	33·97
ttram (Hill End)	,, ,,	680	...	34·40	42·33	...
,, (Matley's Field)	,, ,,	399	38·93	33·16	40·29	37·46
wton	,, ,,	396	33·94	31·80	35·51	33·75
LANCASHIRE—						
erpool Observatory	J. Hartnup, Esq.	52	24·53	23·15	27·66	25·11
,, (The Brook)	W. Lassell, Jun., Esq.	...	...	31·28	39·84	...
,, (Sandfield Park)	W. Lassell, Esq.	...	35·40	...	...	...
NCHESTER—						
,, (Old Trafford)	G. V. Vernon, Esq.	106	36·14	29·74	38·60	34·83
,, (Sale)	J. Curtis, Esq.	134	36·24	28·58	...	...
,, (Market St.)	Mr. Casartelli	...	35·95	29·33	31·78	32·35
,, (Piccadilly)	M. S. & L. R. Co.	194	41·40	34·43	43·95	39·93
,, (Eccles)	T. Mackereth, Esq.	105	...	...	37·66	...
,, (Fairfield)	M. S. & L. R. Co.	312	42·10	35·76	46·33	41·40

DIVISION VIII.—NORTH-WESTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			Aver for 3 y
			1860	1861	1862	
		feet.	inches.	inches.	inches.	inch
Lancashire—*(Cont.)*						
Oldham (Waterhouses)...	M. S. & L. R. Co. ...	345	42·43	32·79	39·74	38·
Radcliffe (Mount Sion)	H. Eaton, Esq.	250	...	...	39·10	..
Bolton-le-Moors (Folds)	H. H. Watson, Esq.	290	57·66	44·91	53·43	52·
,, (Belmont)	H. Baylis, Esq.	800	59·80	55·70	61·90	59·
,, (Heaton)	,, ,, ...	500	44·90	39·90	47·20	44·
Wigan (Standish).....	J. L. Hunter, Esq.	285	46·04	47·63	49·01	47·
Bury.....	W. Wanklyn, Esq....	400?	...	29·67	41·05	..
Ormskirk (Rufford)	J. Porter, Esq.	38	...	...	37·70	..
Preston (Howick).....	T. Norris, Esq.	72	39·76	36·59	44·33	40·
,, (Fishwick)	T. Oddie, Esq.	154	36·04	33·32	38·14	35·
,, (House of Cor.)	Mr. J. Hesketh	140	37·86	35·90	41·76	38·
,, ,,	,, ,, ...	187	33·28	30·75	34·68	32·
,, (Holme Slack)...	J. Newton, Esq.....	143	...	38·48	43·87	..
Blackpool (South Shore)	G. Sharples, Esq. ...	9	31·70	33·70	37·55	34·
Stonyhurst Observatory	Rev. S. Perry.....	381	50·60	49·00	54·40	51·
Garstang (Bleasdale) ...	Mr. J. Hill.....	600	...	55·05	51·43	..
Lancaster	W. Roper, Esq.	114	...	...	46·31	..
,, (Caton)	Rev. A. Christopherson	120	46·82	44·54	44·66	45·
Hest Bank	R. B. Peacock, Esq.	82	...	41·31	43·27	.
Cartmel	S. Marshall, Esq. ...	...	...	47·23	45·67	..
,, (Holker)	,, ,, ...	...	47·07	50·11	47·58	48·
,, (Aynsome)	H. Remington, Esq.	...	...	...	52·90	..
,, (Allithwaite) ...	Mr. W. R. Nash.....	88	...	...	44·99	..
Broughton	British Met. S. Report	...	49·70	...	...	..
Coniston	J. G. Marshall, Esq.	150	89·50	102·20	96·40	96·
Windermere (Wray Casl.)	Dr. Dawson	220	69·45	80·91	74·71	75·

DIVISION IX.—YORKSHIRE.

West Riding—						
Sheffield Station	M. S. & L. R. Co. ...	188	27·58	25·55	28·93	27·
,, (The Edge).....	,, ,, ,,	336	...	32·16	30·73	..
,, (Broomhall Park)	D. Doncaster, Jun...	337	37·19	29·68	30·87	32·
Redmires	,, ,,	1200	44·28	37·94	40·06	40·
Tickhill.....	Dr. Dixon	61	31·33	23·14	18·76	24·
Wath-upon-Dearne	W. M. Burman, Esq	186	...	...	20·09	..
Rotherham, West Melton	Rev. J. Boyd.....	172	...	...	21·99	..
Dunford Bridge	M. S. & L. R. Co. ...	954	62·79	47·88	52·55	54·

DIVISION IX.—YORKSHIRE. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
West Riding—*(Cont.)*						
histone	M. S. & L. R. Co. ...	717	30·11	27·02	29· 09	28·74
lcotes	„ „ „	1075	...	43·62	51·29	...
ndedge	Mr. Greenwood.....	1150	56·75	49·75	53·25	53·25
dleworth	„ „	640	46·99	32·38	43·02	54·13
xworth Villa	W. D. Howard, Esq.	135	33·06	20·89	24·79	29·58
xworth	J. Ford, Esq.....	...	...	18·26	21·83	...
ddersfield (Longwood)	Mr. C. Hare	...	34·74	30·42	34·08	33·08
kefield	W. R. Milner, Esq.	115	33·48	22·30	26·84	27·54
ddersfield (Rastrick)	S. Marshall, Esq. ...	...	33·37	...	32·95	...
lifax (Southowram) ...	R. Richardson, Esq.	880	...	..	25·01	...
„ (Well Head).....	J. Waterhouse, Esq.	540	34·33	30·79	32·22	32·45
„ (Hunter's Hill)	G. W. Stevenson, Esq	1250	42·30	32·70	...	...
„ (Warley Moor)...	„ „	1425	51·20	44·00	49·40	48·20
„ (Midgeley „)	„ „	1350	53·10	48·70	51·00	50·93
„ (Ovenden „)	„ „	1375	51·90	43·70	50·00	48·53
dford	P. Lund, Esq.	329	...	...	29·33	...
„ (HortonHall)...	Mr. G. Abbey	496	38·47	34·05	36·77	35·79
„ (Chellow Dean)	C. Gott, Esq.....	645	...	...	33·30	...
ds	H. Denny, Esq.....	156	...	...	21·74	...
(Holbeck)	E. Filliter, Esq.....	95	...	...	21·79	...
(Holbeck)	Marshall & Co.	135	28·60	23·30	21·25	24·38
(Philosophical Hall)	H. Denny, Esq.....	137	28·32	...	...	...
(Leventhorpe Hall)	J. T. Leather, Esq.	90	...	...	21·18	...
(Eccup)	E. Filliter, Esq. ...	340	...	...	26·11	...
Hall (Whin Moor)...	F. Stow, Esq	455	35·85	24·45	...	...
y (Top of Chevin) ...	Mr. Lawson, Jun. ...	764	...	26·01	32·76	...
(The Valley)	A. H. Thorns, Esq ...	206	...	27·29	31·15	...
Rhydding	J. Robberts, Esq. ...	500	34·30	22.45	...	...
h Harrogate	J. Coupland, Esq. ...	420	...	28·51	...	...
rogate	Dr. Bainbridge	420	...	...	32.58	...
le.....	J. Tatham, Esq	498	41·78	41·79	42·77	42·11
eborough (Clapham)	Mr. D. Elder.....	550	41·64	42·03	45·19	42·95
cliffe	Rev. W. Boyd	750	54·93	59·94	64·05	59·64
ton Spa	F. R. Carroll, Esq...	74	...	...	25·63	...
East Riding—						
rington	W. B. Pugh, Esq. ...	32?	28·58	18·62	18·72	21·79
l	W. Lawton, Esq. ...	30	...	...	19·70	...
(Beverley Road) ...	J. Smith, Jun. Esq.	11	...	...	23·70	...
me-on-Spalding Moor	G. Dunn, Esq.	32	31·70	22·01	24·17	25·96

DIVISION IX.—YORKSHIRE. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Aver for 3 ye
		feet.	inches.	inches.	inches.	inche
East Riding—*(Cont.)*						
Weldrake	Rev. R. B. Cooke ...	40?	30·30	20·54	24·18	25·
Beverley (Middleton)	Mr. Lotherington ...	...	26·78	26·42	26·79	29·
York	J. Ford, Esq.	50	30·37	20·27	23·11	24·
Pocklington (Huggate)	Rev. T. Rankin	650	32·13	32·19	...	..
North Riding—						
Malton	H. Hurtley, Esq. ..	75?	34·46	24·47	26·29	28·
Scarborough	R. Champley, Esq...	91	24·00	17·97	19·83	20·
Redcar	C. C. Oxley, Esq. ...	20	...	...	19·14	..

DIVISION X.—NORTHERN COUNTIES.

Durham—						
Darlington	Mr. J. Richardson...	140	31·91	32·83	21·25	28·
Winston (Stubb House)	T. Dodgson, Esq. ...	460	30·28	24·54	25·84	26·
Washington	J. Watson, Esq.	120	27·61	...	...	..
Durham Observatory	A. Marth, Esq.	338	30·33	24·28	21·82	25·
Bishopwearmouth	Dr. Ogden	140	24·71	19·30	20·97	21·
Sunderland	Rev. G. Iliff	130	29·39	...	21·59	..
,, (Hendon Hill)	J. W. Mounsey, Esq.	150	...	...	24 97	..
Shotley Hall	Mr. G. Routledge ...	309	35·35	28·80	24·04	29·
Nothumberland—						
Allenheads	T. J. Bewick, Esq...	1360	59·15	49·35	44·21	50·
,, (12 in. gauge)	,, ,, ...	1367	59·91	52·89	50·64	54·
Newcastle-on-Tyne	Lieut. Sitwell, R.E.	187	27·28	18·78	...	..
,, (Park End)	G. C. Atkinson, Esq.	300?	...	31·07	...	..
Bywell	Mr. J. Dawson	87	38·13	28·44	25·75	30·
Wylam	G. C. Atkinson, Esq.	96	31·38	23.54	24·68	26·
North Shields	R. Spence, Esq.	124	32·19	24·74	28·02	28·
Stamfordham	Rev. J. F. Bigge ...	380	35·26	26·22	26·00	29·
Alnwick	Mr. J. Scott	400	36·60	29·97	31·02	32·
Roddam	W. Roddam, Esq. ...	...	...	26·27	36·00	.
Lilburn Tower	E. J. Collingwood, Esq.	...	34·21	26·02	30·04	30·
Cumberland—						
Cleator (The Flosh)	T. Ainsworth, Esq...	240	55·89	54·38	...	.
Seathwaite (Borrowdale)	H. C. Marshall, Esq.	380?	142·20	182·58	170·03	164·
Keswick	Mr. Crosthwaite ...	245	54·17	74·42	61·37	63·
Cockermouth	Dr. Dodgson	157	...	...	50·49	.
,, (Winfell Hall)	S. Marshall, Esq. ...	...	...	68·94	60·81	.

DIVISION X.—NORTHERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
Cumberland—*(Cont.)*						
ssenthwaite (Mirehous)	F. S. Spedding, Esq.	300	49·79	60·35	55·29	55·14
lloth	Rev. F. Redford.....	16	37·81	42·47	44·19	41·49
rlisle (Ord. Sur. Office)	Capt. E. James, R.E.	105	31·62	34·46	...	...
Westmoreland—						
rkby Lonsdale	S. Marshall, Esq. ...	...	41·60	...	...	...
ndal	„ „ ...	149	57·00	60·70	54·41	57·37
nbleside (Lesketh How)	Dr. J. Davey	110	79·97	98·03	88·26	88·75
outbeck (The How) ...	Admiral Wilson.....	403	102·58	116·26	94·27	101·04
asmere (Lancregg) ...	Sir J. Richardson ...	...	104·87	123.22	...	...
wther Castle.....	S. Marshall, Esq. ...	...	45·53	...	...	...
ougham Hall.....	„ „ ...	...	36·68	...	33·79	...

DIVISION XI.—MONMOUTHSHIRE, WALES, and the ISLES.

Monmouth—						
epstow	J. G. Wood, Esq. ...	...	...	37·51	39·55	...
Glamorgan—						
vansea (Ystalyfera).....	J. P. Budd, Esq. ...	300	73·21	66·78	67·07	69·02
Pembroke—						
mbroke Dock	E. Chevallier, Esq...	30	...	44·77	...	...
averfordwest	E. P. Phillips, Esq...	60	56·99	51·80	?38·30	49.03
Cardigan—						
mpeter	Rev. J. Matthews ...	425	55·30	43·98	43·22	47·50
Brecon—						
ickhowel (Buckland)...	Mrs. G. Holford	...	...	...	31·29	...
Anglesea—						
andyfrydog	H. Webster, Esq. ...	92	...	44·45	40·14	...
Carnarvon—						
andudno	Dr. Nicol.....	20?	30·00	31·00	31·95	30·98
ngor	Rev. J. Purvis	40	...	...	45·52	...
Radnor—						
nayader (Cefnfaes).....	J. Jones, Esq.	900	...	...	47·81	...
Flint—						
awarden.....	Dr. Moffat.....	260	27·80	21·82	30·37	26·66
olywell (Maes-y-dre) ...	*Chester Courant*.....	...	...	...	24·09	...
nyl	E. Evans, Esq.	...	...	...	19·03	...

DIVISION XI.—MONMOUTHSHIRE, WALES, AND THE ISLES.
(Continued.)

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Aver for 3 ye
		feet.	inches.	inches.	inches.	inch
Guernsey	Dr. Hoskins	200	48·00	31·22	32·50	37·
Jersey	P. Langloise, Esq...	30?	...	...	26·84	..
Scilly—						
St. Mary's	J. G. Moyle, Esq. ...	30	33·20	...	31·18	..
Isle of Man—						
Ballasalla	J. Burman, Esq.....	100	37·17	...	...	..
Calf of Man	Bd. of Northn. Lights	325?	...	...	42·49?	..
Point of Ayre	,, ,,	27?	...	...	31·73?	..

SCOTLAND:

DIVISION XII.—SOUTHERN COUNTIES.

Wigtown—						
Stranraer (South Cairn)	Mr. J. Kennedy.....	210	42·30	48·03	56·00	48·
Mull of Galloway.....	Bd. of Northn. Lights	260?	...	...	25·44?	..
Corsewall	,, ,,	22?	...	...	42·39?	..
Kirkcudbright—						
Cargen	P. Dudgeon, Esq. ...	80	44·27	44·25	47·29	45·
Little Ross	Bd. of Northn. Lights	130?	...	...	26·87?	..
Dumfries—						
Dumfries	T. Hogg, Esq.....	63	41·75	46·88	41·43	43·
,, (Crichton Inst.)	Dr. Gilchrist	300	...	...	45·06	..
Drumlanrig	Scot. Met. Soc. Rep.	186?	...	59·40	57·41	..
Wanlockhead	Mr. J. Reid	1400	72·70	...	...	..
,,	Mr. G. Dawson	1330	65·31	81·19	74·10	73·

DIVISION XIII.—SOUTH-EASTERN COUNTIES.

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches
SELKIRK—						
whill	Mr. J. Mathieson ...	537	32·54	36·21	39·27	36·01
PEEBLES—						
bo Castle	Mr. J. Anderson ...	600	...	27·90	32·70	...
BERWICK—						
lne Graden	Scot. Met. Soc. Rep.	100?	31·80	29·40	32·78	31·33
irlstane.....	„ „	558?	...	31·35	34·50	...
nse (Mungo's Walls)	Mr. J. Thomson.....	267	29·87	28·37	28·80	29·01
HADDINGTON—						
ster	Scot. Met. Soc. Rep.	420?	34·40	33·40	37·84	35·21
eaton	Mr. J. Black	100	21·45	23·97	26·93	24·12
st Linton	Mr. J. Storie	90	26·61	27·19	29·28	27·69
nbar (Thurston)	Mr. R. Mossman ...	320	34·10	25·80	30·40	30·00
lfield	Mr. T. Dods	140	...	...	29·80	...
EDINBURGH—						
rlaw	A. Ramsay, Esq.....	770	38·10	40·30	41·80	40·07
rth Esk Reservoir ...	Mr. J. Garnock.....	1150	39·06	40·27	43·10	40·81
ncorse	A. Ramsay, Esq.....	680	29·70	38·10	43·10	36·97
lkeith Park	Mr. W. Thomson ...	189	...	...	22·81	...
rnielaw	J. Leslie, Esq.	...	32·75	...	39·85	...
sselburgh (Inveresk)	Mr. McAuslane	60	31·97	28·51	32·89	31.12
inburgh	Adie and Sons	200	...	24·88	...	...
„ (Ord. Sur Office)	Mr. J. Horsburgh ...	363	14·39	18·82	...	...
„ (Charlotte Sq.)	J. Leslie, Esq.	195	...	...	33·92	...
„ „ „	„ „	275	...	...	24·12	...
„ (March Hall) ...	Scot. Met. Soc. Rep.	250?	...	...	28·80	...
„ (Inchkeith)	Bd. of Northn. Lights	182?	...	...	21·87?	...

DIVISION XIV.—SOUTH-WESTERN COUNTIES.

LANARK—						
uglas Castle	J. Johnstone, Esq...	780	...	61·09	70·92	...
chinraith	R. Ker, Esq.	150	30·58?	34·94	40·40	35·31
hwell Castle.....	Mr. A. Turnbull ...	250	26·02	25·44	38·96	30·14
sgow (Baillieston) ...	Mr. P. Jarvie	230	33·00	50·04	60·67	47·90
tts (Hill-end House)	Mr. D. Thomson ...	620	30·49	39·95	41·09	37·18
sgow (Observatory)...	J. Wood, Esq.	200	35·76	51·11	57·40	48·09
(Ord. Survey Office)	Major Bayly, R.E....	160	28·87	33·20	...	...

DIVISION XIV.—SOUTH-WESTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Aver for 3 ye
		feet.	inches.	inches.	inches.	inch
LANARK—*(Cont.)*						
Ryat Linn	J. Burnet, Esq.	310	41·50	58·70	58·95	53·
Waulk Glen	,, ,,	280	39·45	55·30	55·25	50·
Middleton	,, ,,	550	44·72	66·08	68·08	59·
Black Loch	,, ,,	700	...	69·25	68·70	...
AYR—						
Auchendrane House	E. Cathcart, Esq.	94	41·93	49·21	50·17	47·
Largs (Mansfield)	Dr. Campbell	30?	44·60	55.80	54·70	51·
Brisbane Glen	J. Miller, Esq.	...	48·45	62·00	59·70	56·
Eaglesham (Ravoch)	A. Mather, Esq	700	...	...	72·60	...
RENFREW—						
Mearns (Nither Place)	A. Mather, Esq	350	43·40	46·70	43·00	44·
Kilbrachan	D. Rubie, Esq.	350	58·57	78·82	75·20	69·
Paisley (Locherfield)	Mr. A. Hardie	...	...	55·90	...	...
,, (Ferguslie House)	Mr. T. Stewart	85	42·58	66·79	62·03	57·
Greenock	J. Gardner, Esq	64	59·25	69·14	74·25	67·

DIVISION XV.—WEST MIDLAND COUNTIES.

DUMBARTON—						
Balloch Castle	A. L. D. Brown, Esq.	91	...	...	67·68	...
Loch Long (Arddarroch)	J. White, Esq.	80	...	...	85·13	...
STIRLING—						
Stirling	Scot. Met. Soc. Rep.	233?	34·57	...	...	...
,, (Polmaise Gardens)	— Murray, Esq.	8	42·60	46·60	49·30	46·
Mugdock Reservoir	Glasgow Water Works	320	...	...	60·60	...
BUTE—						
Isle of Cumbrae	J. Miller, Esq.	50	40·70	47·20	48·40	45·
Rothesay	Sharp, Thompson & Co	40	48·20	56·40	...	...
Pladda	Bd. of Northn. Lights	55?	...	...	53·69?	...
ARGYLE—						
Castle Toward	Mr. D. Bell	80?	47·18	65·34	62·27	58·
Dunoon (Hafton)	Major Bayly, R.E.	40	61·83	82·14	91·32	78·
Otter House	Dr. Rankin	130	47·76	63·84	64·46	58·
Kilmory, Lochgilphead	Sir J. P. Orde, Bart.	100?	53·72	59·29	56·96	56·
Calton Môr	Mr. J. Russell	65	45·85	55·83	56·47	52·
Kilmartin	,, ,,	64	...	63·50	...	...
Inverary Castle	Mr. J. Caie	30	66·40	78·60	63·90	69·
Isle of Easdale	Mr. J. Whyte	25	47·90	55·50	57·80	53·

DIVISION XV.—WEST MIDLAND COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
ARGYLE—*(Cont.)*						
n	Capt. Bedford, R.N.	10	54·60	71·98	72·40	66·33
of Mull (Torosay) ...	J. Pettigrew, Esq....	18	70·60	101·80	94·00	88·80
npbeltown (Devaar)...	Bd. of Northn. Lights	75?	...	...	52·54?	...
nns of Islay.....	,, ,, ,,	74?	...	...	34·47?	...
y (McArthurshead)...	,, ,, ,,	106?	...	...	68·60?	...
(Rhu Vaal)	,, ,, ,,	54?	...	...	99·90?	...
a Sound (Fladda) ...	,, ,, ,,	20?	...	...	80·90?	...
more	,, ,, ,,	37?	..	...	48·39?	...
ran (Loch Eil).	,, ,, ,,	14?	...	...	54·54?	...
ll of Cantire.....	,, ,, ,,	279?	...	...	43·22?	...
nd of Mull	,, ,, ,,	12?	...	...	75·50?	...
lnamurchan	,, ,, ,,	82?	...	...	53·04?	...
ne.....	Mr. J. Pettigrew ...	250	...	...	54·50	...
ermorey (Erray).....	,, ,, ...	260	...	...	76·00	...

DIVISION XVI.—EAST MIDLAND COUNTIES.

LACKMANNAN—						
lar	Mr. J. Westwood ...	170	...	...	47·74	...
INROSS—						
h Leven	Mr. P. Farnie.....	...	36·10	37·30	42·20	38·53
IFE—						
of May	Bd. of Northn. Lights	182?	...	...	25·08?	...
four	Mr. J. Dewar.....	127	24·36	26·76	34·59	28·57
kton (Leven)	W. McG. Miller, Esq.	80	30·65	30·42	34·28	31·78
tenweem	Mr. D. Tennant.....	75	27·36	28·45	25·97	27·26
ERTH—						
erfoyle	J. Burnet, Esq.	60	40·40	71·60	77·00	63·00
lard	,, ,, ...	1500	73·50	103·10	102·70	93·10
nblane (Kippenross)	J. Stirling, Esq.....	100	34·10	41·80	49·90	41·93
anston	J. Finlay, Esq.	120?	37·30	45·05	51·55	44·63
h Dhu.....	J. Burnet, Esq.	325	...	93·20	101·10	...
a Lomond.....	,, ,, ...	1800	83·50	99·90	114·17	99·19
h Drunkie	,, ,, ...	420	...	71·70	78·10	...
Vennachar	,, ,, ...	275	...	72·70	69·00	...
dge of Turk	,, ,, ...	270	59·80	74·40	71·90	68·70
rick Castle	A. Glover, Esq.	150?	45·10	53·30	57·75	52·05
h Katrine (Tunnel Hill Top)	J. Burnet, Esq.	830	...	89·20	96·90	...

DIVISION XVI.—EAST MIDLAND COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Ave for 3
		feet.	inches.	inches.	inches.	inc
Perth—*(Cont.)*						
Leny (Callander)	J. B. Hamilton, Esq.	335	...	72·40	75·00	..
Between Glen Finlas and Ben Ledi	J. Burnet, Esq.	1800	53·80	70·40	66·00	63·
Glen Gyle	,, ,,	380	94·20	112·50	105·10	103
Auchterarder House	Mr. R. Wylie	150	28·70	32·98	38·97	33·
Stronvar (L. Earn Head)	D. Carnegie, Esq.	460	75·64	88·65	97·84	87·
Colquhalzie House	J. S. Hepburn, Esq.	60?	37·85	44·34	49·52	43·
Trinity Gask	Mr. R. Wylie	135	33·55	38·20	39·34	37·
Perth (Early Bank)	Gen. Lindsay	66	37·88	36·08	45·91	39·
,, (Academy)	Dr. Miller	...	...	...	25·97	..
Scone Palace	A. Buchan, Esq.	...	28·75	31·13	34·46	31·
Tyndrum Mines	Mr. D. McLaren	792	72·70	133·20	...	...
Stanley	Rev. W. Mather	200	31·11	34·58	34·07	33·
Meigle (Belmont)	W. Stewart, Esq.	300	32·50	32·10	...	...
Taymouth	Scot. Met. Soc. Rep.	372?	...	40·70	...	...
Forfar—						
Dundee	Mr. Adamson	60	34·71	28·71	33·26	32·
,, (Somerville Place)	J. Kerr, Esq.	230	...	...	33·09	..
Barry	Mr. J. Proctor	35	28·85	27·87	32·54	29·
Craigton	Mr. Adamson	440	37·57	34·93	38·24	36·
Kettins	Mr. J. Gibb	218	36·39	32·29	34·49	34·
Hill Head	Mr. Adamson	500	37·43	35·55	37·33	36·
Seichen	,, ,,	550	38·80	36·88	38·46	38·
Arbroath	A. Brown, Esq.	65	30·48	29·66	31·33	30·
Montrose	Mr. W. Leighton	21	...	25·83	30·27	..
,, (Museum)	Mr. J. Campbell	8	26·32	24·03	27·60	25·
,, (Usan)	G. Wyness, Esq.	150	...	...	29·00	..

DIVISION XVII.—NORTH-EASTERN COUNTIES.

Kincardine—						
Brechin (The Burn)	Col. McInroy	210	41·50?	40·80	36·20	39·
Fettercairn (Balnakettle)	D. Scott, Esq.	450	42·81	44·58	37·73	41·
,, (Bogmuir)	R. Vallentine, Esq.	200	37·40	35·60	32·40	35·
Strachan by Banchory	Mr. McConnachie	200	38·16	31·43	33·39	34·
Banchory by Aberdeen	A. Thomson, Esq.	95	33·90	29·80	26·50	30·

DIVISION XVII.—NORTH-WESTERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
Aberdeen—						
raemar	Dr. Cameron	1110	33·36	34·80	33·84	34·00
berdeen	A. Cruickshank, Esq.	100	34·70	30·97	30·77	32·15
„ (Girdleness) ...	Bd. of Northn. Lights	85?	...	...	25·54?	...
stle Newe	Mr. A. Walker	915	40-49	39·06	29·41	36·32
lon (Tillydesk)	Mr. W. Hay	360?	...	...	28·26	...
terhead (Buchanness)	Bd. of Northn. Lights	35?	...	...	22·44?	...
nnairdhead	„ „	64?	...	...	25·02?	...
Elgin—						
rres	D. Bonthrone, Esq...	53	...	...	30·48	...
gin	Scot. Met. Soc. Rep.	...	25·71	...	...	...
„ (Ashgrove)	W. Topp, Esq.	33	...	...	29·63	...

DIVISION XVIII.—NORTH-WESTERN COUNTIES.

Ross—						
e of Lewis (Stornoway)	Sir J. Matheson, Bart	70	42·80	58·07	37·23?	46·03
„ (Bernera) ...	„ „ „	15	32·37	60·91	104·95	66·08
rbetness	Bd. of Northn. Lights	61?	...	...	47-59?	...
ch Alsh (Kyleakin) ...	„ „ „	3?	...	...	68·04?	...
Inverness—						
aufort Castle.....	Mr. J. Moir	40	27·44	34·91	30·70	31·02
lloden House	A. Forbes, Esq.	104	21·51	31·41	24·63	25·88
e of Skye (Portree) ...	J. Grant, Esq.	60	87·99	139·04	111·19	112·74
„ (Raasay House)	Mr. T. Bunning ...	80	57·60	86·40	79·20	77·73
„ (Oronsay)	Bd. of Northn. Lights	15?	...	...	67·50?	...
rth Uist (Loch Maddy)	Sir. J. P. Orde, Bart	20?	42·65	60·40	69·45?	57·50
rrahead	Bd. of Northn. Lights	640?	...	...	34·65?	...
uth Uist (Ushenish)...	„ „ „	157?	...	...	51·93?	. .
rris (Island Glass) ...	„ „ „	50?	...	...	25·14?	...
omarty	„ „ „	28?	...	...	20·36?	...

DIVISION XIX.—NORTHERN COUNTIES.

Caithness—						
sshead	Bd. of Northn. Lights	127?	...	...	21·04?	...
nnethead	„ „ „	300?	...	...	25·11?	...
ntland Skerries.....	„ „ „	72?	...	...	29·23?	...

DIVISION XIX.—NORTHERN COUNTIES. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Aver... for 3 ye...
		feet.	inches.	inches.	inches.	inch...
SUTHERLAND—						
Dunrobin Castle	Mr. J. Mitchell	6	29·40	27·45	23·65	26·...
Scourie	J. Simpson, Esq.....	20	38·30	50·85	...	..
Tongue House	J. Crawford, Esq. ...	30?	42·10	...	37·50	..
Cape Wrath	Bd. of Northn. Lights	355?	...	...	40·26?	..
ORKNEY—						
Balfour (Kirkwall)	D. Balfour, Esq.....	50	28·18	33·10	25.60	28·...
Sandwick (Lawn).....	Rev. C. Coulston ...	78	37·96	41·18	34·38	37·...
„ (North Park)...	„ „ ...	94	...	...	33·68	..
Cantickhead	Bd. of Northn. Lights	63?	...	...	44·30?	..
Hoy Sound (East)	„ „ „	27?	...	...	33·43?	..
„ (West)	„ „ „	37?	...	...	33·85?	..
Sanda (Start Point).....	„ „ „	29?	...	...	25·54?	..
North Ronaldsay	„ „ „	21?	...	...	34·27?	..
SHETLAND—						
Bressay	Rev. Z. M. Hamilton	20	36·80	41·15	45·95	41·...
„	Bd. of Northn. Lights	72?	...	...	36·97?	..
Sumburghead	„ „ „	265?	...	...	27·62?	..

IRELAND:

DIVISION XX.

CORK—						
Cork Royal Institution...	J. Humphreys, Esq.	80	31·91	38·28	38·09	36·...
Queen's College	Professor England ...	50	...	...	47·27	..
KERRY—						
Valentia	The Knight of Kerry	50	...	72·40	62·19	..
WATERFORD—						
Waterford.....	R. J. Greer, Esq.....	60	40·86	43·83	45·23	43·...
Portlaw.....	A. Free, Esq.....	50?	...	49·31	50·10	..
Rathculliheen	„ „	135	37·56	38·79	41·21	39·...
LIMERICK—						
Limerick	Rev. C. Mayne	...	...	44·32	...	..

DIVISION XX. *(Continued.)*

STATIONS.	AUTHORITIES.	Height above Sea Level.	Depth of Rain.			
			1860	1861	1862	Average for 3 years.
		feet.	inches.	inches.	inches.	inches.
CLARE—						
Killaloe	Rev. C. Mayne	128	48·76	51·84	49·85	50·15
„	„ „	123	...	53·74	47·37	...
KING'S COUNTY—						
Birr Castle	Earl Rosse	202?	...	...	36·28	...
QUEEN'S COUNTY—						
Portarlington	M. Hanlon, Esq.....	245	34·84	36·70	45·16	38·90
WICKLOW—						
Bray (Fassaroe).....	E. Barrington, Esq...	250?	57·52	51·00	45·80	51·44
GALWAY—						
Galway (Queen's College)	Professor Curtis.....	25	...	58·62	51·61	...
DUBLIN—						
Black Rock	T. Bewley, Esq.....	96	26·70	24·67	24·98	25·45
Dublin (Ord. Surv. Office)	Capt. Wilkinson, R.E.	166	...	27·49	30·18	...
„ (Glasnevin)	D. Moore, Esq.	65	31·08	30·16	28·04	29·79
„ (Vicar's Lodge)...	S. Yates, Esq.	89	...	...	24·63	...
Monkstown	W. H. Pim, Jun., Esq	90	33·26	31·89	31·25	32·13
„	„ „	190	...	21·01	20·75	...
MAYO—						
Lough Corrib (Cong).....	G. H. D'Arcy, Esq...	60?	43·44	...	...	...
SLIGO—						
Markree Observatory ...	E. J. Cooper, Esq....	145	43·74	47·16	39·91	43·60
FERMANAGH—						
Florence Court.....	Earl of Enniskillen	300	...	...	49·56	...
ARMAGH—						
Armagh Observatory ...	Rev. Dr. Robinson...	247	...	43·20	42·05	...
DOWN—						
Belfast (Queen's College)	J. Bell, Esq.	58	38·23	34·02	39·18	37·14
„ (Linen Hall).....	J. Stewart, Esq.....	12	39·84	37·41	41·18	39·48
Strabane (Leckpatrick)...	Rev. C. Maxwell ...	260	...	...	42·45	...

The average fall of rain at Manchester (Old Trafford)* for the years 1860-61-62, is 34·49 inches. This does not widely differ from that furnished by Sir John Herschell for a series of years, viz., 36·2, in an article from which a quotation will be found elsewhere. There are two other registration stations at Manchester, both in the middle of the town, and not more than half a mile distant from each other, but whose results present a remarkable disparity. One of these (conducted by Mr. Casartelli) is in Market-street, the elevation above sea level not stated, but probably about 140 feet. The average fall here for the three years named is given at 32·35 inches. The other station is on the premises of the Manchester, Sheffield, and Lincolnshire Railway Company—whose attention to this subject, be it remarked, is exemplary and worthy of imitation,—rain gauges having been placed at almost every station throughout the ramifications of their lines. The elevation of their instrument at Manchester is stated at 194 feet above sea level, and the average rain fall for the past three years 40·59 inches.

The average rain fall at Manchester for these three stations in 1860-61-62 stands at 35·81 inches.

The greatest depth of rain which fell at any place in England in 1860-61-62, according to these records, occurred at Seathwaite, Cumberland, being 164·93 inches; the lowest was at Shrewsbury, 18·17

* On the authority of G. V. Vernon, Esq.

inches. But Mr. Symons expresses a doubt as to the correctness of the figures for this place. The next lowest was 19·29 inches, at Barnetby.

Mr. G. V. Vernon, in a paper communicated to the Literary and Philosophical Society of Manchester, February 24, 1863, has exhibited tables representing the amount of rain fall in the vicinity of Manchester for the past 69 years, from 1794 to 1862. From these results it appears that the average amount of rain which fell annually during this period is 35·427 inches. The number of rainy days in Manchester in 1862, which was unusually wet everywhere in these islands, was 218. But as the rain fall at Manchester in 1862 was 3·171 inches above the average, it is presumable also that the number of rainy days as here given is proportionately in excess; so that the average number of days on which rain fell for the 69 years ended 1862 would be, according to this estimate, less than 200, and not 218.

Mr. Vernon has kindly informed me that from results obtained by observation during the past few years, he has reason to think that 180 will be about the average of rainy days per year for Manchester.

Mr. Symons remarks, in reference to the number of rainy days in different localities, that at about one hundred stations have results on this subject been furnished by observers; but as it is still evident that no uniform system is adopted, the

results must not be published. "The *best* plan would undoubtedly be to record, however approximately, the number of *hours* during which rain falls; but failing this, it would probably accord best with the usage of the majority of observers to consider a 'rainy day,' each day on which a measurable amount of rain falls. No measurement of less than 0·01 inches to be taken account of."*

This suggestion is so reasonable that it is impossible to take objection to it. For it often happens in Manchester, and doubtless also in other large towns, that moisture is present in the atmosphere during a high reading of the barometer and with a still air, even in the absence of rain clouds. Such occurrence however should be considered as a fog moisture only, and not as a rainy day.

The following results, representing the annual amount of rain fall in places beyond the British Isles, rests upon the authority of Sir John Herschell.†

	Inches.		Inches.
Stockholm	20·4	St. Helena	45·2
Petersburg	17·3	Grenada	112·0
Strasburg	27·3	Sierra Leone	86·2
Cambridge, U.S.	38·9	Bergen	88·6
Philadelphia, U.S.	37·2	Rome	31·0
Washington, U.S.	41·2	Florence	41·3
Lisbon	27·1	Genoa	47·3

(*) British Rain Fall for 1862, p. 6.—By G. J. Symons, Esq.
† Encyclop. Brit., Art. Meteorology.

	Inches.		Inches.
Williamsburg, U.S.	47·0	Padua	36·9
Madeira	27·7	Verona.....	36·9
Charleston	54·0	Vicenza	43·8
Havannah	91·2	Milan	37·8
Rio Janeiro	59·2	Lausanne	40·2
Calcutta.....	76·4	Berne	46·1
Bombay.....	75·2	Augsburg.....	39·1
St. Domingo .....107·6		Paris.....	22·2
Madras	44·6	Prague	14·1

It appears from these and the preceding results, that altitude above the sea level has a marked influence in increasing the rain fall. This, which I understand is a rule (with exceptions), holds good to the height of 2,000 feet, above which the humidity gradually lessens with the increasing elevation.

Respecting the actual density and existing distribution of the population of Manchester, and the relative salubrity of its different districts, some notion may be gathered from the following statements derived from the Registrar-General's tables, representing the average results for the ten years ended 1860.

Manchester (with the Chorlton Union), including the borough of Salford, with their suburbs, contained, in 1861, a population of 518,902 persons, occupying an area of 29,007 acres, being at the rate of 17·88 persons to the acre. It has a death-rate of 72·71—that is to say: for every 100 births, there occurred, in the ten years ended 1860, an average of 72·71 deaths. The average death-rate for the

whole of England during the same ten years was 65·06, showing for Manchester an excess of 7·65 per cent above the general average; but the density of population for the whole of England is represented by ·54, being rather more than one person to every two acres. So that, were each individual—man, woman, and child—to be placed in the centre of his apportioned space of 1·86 acres, they would probably be within hearing distance of each other when shouting, provided the atmosphere were still.

The three component Unions of Manchester, however, exhibit results very different from each other as regards their rates of mortality, and presumably also as to their relative salubriousness, as represented below :—

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Manchester	12,628	243,988	19·32	81·53*
Chorlton	11,549	169,579	14·68	61·92†
Salford	4,830	105,335	21·81	67·82
Total.....	29,007	518,902	17·88 mean	72·71

But the preceding figures afford only a very inadequate notion of the actual condition of the crowded parts of the town, as the sparseness of the population occupying the out-lying districts, and herewith incorporated, tend to modify the general result, and consequently to conceal the real state of the centre. In order, therefore, to expose these relations more clearly, it may be convenient to

* This includes the fatalities in the Workhouses, Hospitals, and Asylums, one of the latter being a County Asylum.

† This item includes the Workhouse fatalities for the five years ended 1855.

render the results for the outside townships and those for the town proper, separately.

The out-townships of Manchester are Newton, Cheetham, Failsworth, Blackley, and Prestwich; those of Chorlton—Didsbury and Gorton; and those of Salford—Pendleton and Broughton. The items representing their respective populations, densities, and death rates, stand as follow:—

		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Manchester.	Newton	1,924	19,311	10·04	59·19
	Cheetham.....	1,652	21,731	13·15	54·25
	Failsworth. ...	2,335	6,312	2·71	55·83
	Blackley	1,056	4,939	2·52	57·14
	Prestwich, W.A.	3,281	6,285	1·91	58·27*
Chorlton.	Didsbury W.	5,948	5,904	1·00	74·66†
	Gorton.....	3,531‡	7,000‡	1·98	55·67
Salford.	Pendleton.....	2,650	24,448	9·22	59·91
	Broughton	960	9,885	10·30	52·25
	Total	23,337	105,815	mean 4·36	

W. signifies Workhouse; H., Hospital; and A., Asylum.

* The average death-rate affecting the permanent inhabitants of these five out-townships is 56·91; but including the Workhouse fatalities (furnished by Mr. Parker, Clerk to the Guardians), amounting in ten years to 178, it is 57·83. The deaths in the County Asylum, situate in the Prestwich township, cannot with fairness be included.

† This rate for Didsbury, the average for the five years ended 1855, before the Union Workhouse was removed to this district, is undoubtedly high, especially considering the sparseness of its population, which is less than one to the acre. The whole township is flat, tolerably well wooded with hedge-row timber and plantations, and the soil remarkably productive. The high rate of mortality of this suburb it may be difficult to account for; but it is certain that in some parts the drainage is extremely defective.

‡ These are estimated numbers. The actual figures may be a little higher or lower, but probably not widely different from those assumed.

From this table it may be seen that the suburbs are very differently circumstanced in some essential points as compared with the entire mass; the density being at the rate of 4·36 persons to the acre, and the average death-rate only 57·39.

Deducting the sum of 105,815, which represents the aggregate suburban population, from 518,902, there remain 413,087 inhabitants for the town proper. These are confined to a space of 4,770 acres, or 86·60 persons to the acre, and have an average death-rate of 76·50.

The respective results for the three townships composing this central mass are thus stated:—

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Manchester	1,480	185,410	125·28	86·25
Chorlton	2,070	156,675	106·10	62·46
Salford	1,220	71,002	58·20	71·24
Total	4,770	413,087	86·60 mean	76·50

Of these three groups the Manchester township appears to be the most densely peopled, and at the same time the most insalubrious; a coincidence which would naturally lead to the conclusion that overcrowding may have an important share of influence in the production of a high death-rate. Such inference would appear to be further supported by a comparison of the above figures for Manchester with the items of the third line for Salford, which presents a death-rate of 15 per cent lower than that of Manchester, and an acreage population lower by

more than one-half. But, looking at the second line, which represents the corresponding conditions for Chorlton, and comparing them with those of Salford, it will be seen that the death-rate for Chorlton—a much larger community—is 8·78 per cent below that of Salford, while its density of population is 49·90 per acre greater. Overcrowding therefore, cannot, in this instance at least, be regarded in the light of a destructive evil, and probably becomes so under certain degrees of aggravation only; and especially when conjoined with other maleficent influences. This will probably appear more clearly evident from the results of a further analysis of the preceding groups.

The Manchester township is divided into five registration districts, namely: St. George, Ancoats, London Road, Deansgate, and Market-street. Of the 1,480 acres which constitute the area of the township, the several districts occupy portions varying in extent, but by no means proportioned to the number of their occupants. The exact amount of space for each is not stated in the Registrar-General's tables; but their boundaries, being carefully marked on the map, may possibly afford a means of estimating their several areas approximatively.

The St. George's district has a population of 48,055, occupying an estimated area of about 250 acres, which gives a density of 192·22 to the acre.

Its average death-rate for the ten years ended 1860 was 67·44 to 100 births.

The population of the Ancoats district is 55,983, and the area occupied by them is estimated at 360 acres, yielding a density of 155·50 to the acre. Its death-rate for the ten years ended 1860, including the fatalities in a large workhouse, was 76·72.

The London Road district numbers a population of 28,817, occupying an area of 280 acres, being at the rate of 102·92 persons to the acre, and an average death-rate for the same ten years of 80·05.

The population of Deansgate amounts to 29,029. The area of the district is estimated at 290 acres, giving an acreage population of 100·10. Its death-rate is 85·54.

The Market-street district, extending over an estimated space of 300 acres, has a population of 23,526 persons, giving a density of 75·42 to the acre. Its rate of mortality for the ten years ended 1860 was 150·74. In this estimate, however, are included the deaths which occur in the Union Hospital, as well as those in the Royal Infirmary. The collective deaths which occurred in ten years in these establishments amount to 8,770,* which, deducted from the general sum of 14,774, give a death-rate for the permanent inhabitants of this district of 76·00. It

* Assuming the result given in the last Annual Report of the Royal Infirmary to represent the average for this institution. Those for the Union Hospital for ten years were obligingly furnished by Mr. Harrop, Clerk to the Guardians.

should be stated, moreover, that in arriving at this average, the number of births in the ten years (1,903) in the Union Hospital were also taken into account, so that the estimate given applies to the permanent residents only.

The analogous conditions of the sub-districts of Salford (which borough will not be farther particularised on this occasion) and Chorlton, will be sufficiently exposed in the following table, showing the population, acreage-density, and death-rate of the respective districts. The results represent the average for the ten years ended 1860:—

	Districts.	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Manchester.	St. George	250	48,055	192·22	67·34
	Ancoats, W.	360	55,983	155·50	76·72*
	Market-st., W.H.H	300	23,526	79·42	76·00†
	London Road	280	28,817	102·88	80·05
	Deansgate	290	29,029	100·10	85·54
Chorlton.	Ardwick	500	40,752	81·50	58·11
	Hulme.....	870	71,128	81·75	61·75
	Chorlton	700	44,795	63·99	62·47
Salford.	Greengate.....	1,220	37,534	58·20	68·82
	Regent Road, W.		33,469		74·24
	Total population		413,087	mean 86·60	mean 76·50

Here also the circumstance of agglomeration, as an agent of insalubrity, would appear to hold a

* Including the workhouse fatalities.

† Exclusive of the fatalities in the workhouse and hospitals.

place very different in importance from that which is usually assigned to it. In fact, the most healthy district of the Manchester *township*—that of St. George namely, is at the same time by far the most densely crowded; for, whilst it contains a population more than 36 per acre greater than that of the highest, its death rate is at least $2\frac{1}{2}$ per cent lower than the lowest of the rest. And viewing the results for the five districts from first to last in succession, the density will be observed to decrease in a certain ratio as the rate of mortality increases. Nearly the same order obtains in respect to the Chorlton and Salford townships.

Certain conditions of distribution—occasioned by the occupation of large spaces of ground by manufactories, warehouses, and other establishments not tenanted as dwellings, and therefore not included in the census estimate, will necessarily tend to concentrate the inhabitants and to augment the density. The St. George's district is less occupied in this way than any of the others. It contains only a few manufactories and machine works comparatively; but in addition to these, the spaces occupied by the extensive storehouses and locomotive engine works of the Lancashire and Yorkshire Railway Company, and that covered by the chief gas establishment of the town, may be safely reckoned at one-tenth of the entire district; thus raising the actual population density to at least 210 to the acre.

The large manufacturing and other establishments of the Ancoats district occupy probably one-seventh of this quarter, giving an actual population density of 180 to the acre instead of 155. In like manner the London Road and Deansgate districts, still more largely covered by railway works, manufacturing establishments, warehouses, wharves, &c., to the extent of at least one-fifth of the entire space in each, will give, for the former, a density of 128 instead of 102; and for the latter, 125 instead of 100 inhabitants to the acre.

The Market-street district is yet more peculiarly influenced in this way. Probably three-fifths of its entire space of 300 acres,—but to be within the mark, say one half at least, is occupied by warehouses and closed shops, railway premises, hospitals, &c., untenanted during the night—(except the hospital populations, which are not included in this estimate). So that its population density, instead of being 75·42 as given, must be more than 150 persons to the acre.

The following table represents in brief the disparities above indfcated.

Districts.	Apparent Acreage density.	Estimated Acreage density.
St. George.....	192·22	213·57
Ancoats.....	155·50	182·35
London-road.....	102·88	128·73
Deansgate.....	100·10	125·12
Market-street	79·42	158·84

Still is the circumstance of overcrowding insufficient to account for the high death-rate in the last three districts; for it must be again instanced, that the St. George's district possesses a density of population of at least 54 per acre above that of Market-street, even as compared with the latter elevated estimate, and yet has a lower rate of mortality by $2\frac{1}{2}$ per cent.; and 31 per acre higher than that of Ancoats, while its death-rate is 9 per cent lower.

Further. In regard to the relation which agglomeration holds to the co-existence of a high death-rate, it may be remarked that the more elevated or north-east division of the Manchester township (St. George and Ancoats), has *increased* in population from 94,810 in 1851, to 104,038 in 1861; yet has its death-rate decreased from 73·85, the average for the first half of the decennium—1851-55, to 71·80, the average for the second half—1856-60. The converse of this is found to prevail in the lower quarter (comprising London Road, Deansgate, and Market-street). The population of this quarter has *decreased* from 92,176 in 1851, to 81,372 in 1861; yet has its death-rate *increased* from 78·57, the average for the first half of the decennium—1851-55, to 80·61, the average for the second half—1856-60. These several items may be conveniently tabulated as follows.

	Population in 1851.	Population in 1861.	Average deaths per 100 births, 1851-55.	Average deaths per 100 births, 1856-60.
St. George..... Ancoats.....	94,810	104,038	73·85	71·80
London Road Deansgate..... Market-street	92,176	81,372	78·57	80·61

It will be seen, that notwithstanding the *augmentation* of density affecting the first group to the amount of 15 persons to the acre, the death-rate has *decreased* by 2·05 per cent; while the density of the second group has become *lessened*, during the same period, to the amount of 12·42 per acre, and the death-rate elevated by 2·04 per cent.

It is popularly believed, especially by those residing at a distance and engaged in other pursuits, that the various employments in cotton manufactories exercise a peculiarly pernicious influence upon the health and bodily growth of those engaged in them; and that the manufacturers who encourage, and increase their wealth by such means must in justice be held accountable for some imaginary but incalculable amount of misery and fatality which their system is the medium of inflicting. There cannot be a fairer opportunity of testing the truthfulness or fallacy of these assertions than is afforded by the results furnished in the ables of the Registrar-General, bearing on the rate of mortality of the north-east and south districts

of the town, which contain the dwellings of, at a rough computation, not less than four-fifths of all the factory operatives of the *borough* of Manchester.

This mass of population, amounting to 260,713 persons, is naturally divided by the river Medlock into two groups, one occupying the north-east or right bank, the other the south or left bank of this stream. The two divisions are somewhat differently circumstanced in several respects ; but especially in regard to the nature of the soil upon which they are respectively situated, their relative density of population, and the social condition of the inhabitants who occupy them.

The north-east division consists of the two districts of St. George and Ancoats, numbering a population of 104,038 persons, occupying a space of 610 acres, which gives a density of 170·55 to the acre, but their actual computed density is 195·56 to the acre. The soil is everywhere a dense clay, formerly much used for brickmaking; but the whole district, now crowdedly covered by buildings, is considerably elevated above the river level, and well drained throughout. At least nine-tenths of the houses are small cottage tenements, occupied by operatives. Many of these dwellings, especially such as have been erected within the past few years, are comparatively commodious and healthy, being provided with both front and back doors, by which means a thorough ventilation is secured. Each dwelling is

abundantly supplied with excellent water, and in most instances the household drainage is effectual. Most of them are certainly void of cellarage, the flags or tiles of one or both rooms lying on the soil; but as it is usual to interpose a layer of ashes between the flags and the original soil, it is only now and then that any appearance of dampness is observable. The cellarage occupancy is comparatively limited, care having been taken to rectify this evil, formerly much more prevalent than in the present day.

In this combined district, the dwellings retain of necessity the old-fashioned appendage which has fallen much into disuse in large towns, namely, the outside ashpit or cesspool, which serves to receive the ordure and refuse of the household. This "sink of infection," as it has been denominated, is thought by some to be a means of engendering fevers and other pestilential diseases. No greater error could have been committed, or assumption more gratuitous hazarded, implying a total misconception of nature's own provision for the preservation of physical integrity. Animal ordure in a healthy state, however exposed, does not undergo any change calculated to render it noxious to the health of those subjected to its effluvia. Night-soil men, since they have been persuaded to be temperate, are amongst the healthiest of workmen. It is true, vegetable and animal refuse, the articles chiefly susceptible

of noxious transmutation, are thrown into the same receptacle, but these are daily covered by coal ashes from the house fires—one of the most potent as well as the most plentiful of disinfectants which we possess. In the centre of the town this material is otherwise disposed of, being collected in the early morning at the doors of dwellings and warehouses by the cart of the scavenger, most of the fermentible material, small in individual instances, but cumulatively large, having been already consigned elsewhere.

One circumstance connected with this north-east quarter should not be passed over unnoticed. It is this: Although, besides the streets, it contains no open space, either covered or uncovered, for physical recreation; no garden allotments—scarcely a patch of garden ground, and barely a green herb or shrub in its whole extent except those occasionally seen in the cottage windows; no hospital or dispensary, either special or general, whereat appeal for succour might be made in case of accident or other personal exigency; and a population unprecedentedly crowded considering its multitude, and at the same time so isolated as a class; yet is its death-rate considerably lower, and inferentially its sanitary condition much more favourable than that of several of the chief cathedral towns of England, including the two archiepiscopal sees,* whilst its density of population is

* Of these may be instanced Canterbury, Winchester, Chichester, Norwich, Salisbury, Exeter, Hereford, Worcester, Chester, York.

much more than one hundred and fifty persons to the acre greater than that of any of them.

The other portion of the quarter containing the dwellings of the factory operatives, comprising the Chorlton townships, occupies the south or left bank of the river Medlock, and consists of Hulme, Chorlton-upon-Medlock, and Ardwick. This quarter contained, in 1861, a population of 156,675 persons, occupying an area of 2,070 acres, which yields a density of 75·70 persons to the acre,—to say nothing of increased agglomeration caused by the presence of manufactories, which however are fewer in this than in the other districts,—and exhibits a death-rate of 60·61,*—lower by 4·45 per cent than the general average for England, and lower than that of any county or cathedral town in the kingdom, except Appleby; whilst its acreage population is immensely greater than that of any. The whole of this quarter is flat, but possesses a sufficient fall towards the rivers for effectual drainage. Its soil is light and porous in at least five-sixths of its extent, being chiefly sandy in the Ardwick township, and gravelly elsewhere, with patches of clay towards its southern confines. The tenements, generally more modern than those of the St. George-Ancoats district, are in the main commodious and comfortable, their supply of water and household drainage good, and

* This number includes the fatalities in the Union Workhouse for the five years ended 1855.

the streets generally are wider; and there exist also several large open spaces which serve doubtless to improve the salubrity of the atmosphere. This district contains, moreover, a considerable number of detached establishments, the residences of private families, as well also as a still greater number of less pretentious but excellent houses, sufficiently commodious as dwellings for families of ample means. The proximity of this wealthier class has here, as similar comminglings of social elements have elsewhere, the effect of visibly improving the moral tone of the populace, and of augmenting their material comforts.

It is but an act of justice towards an important class of the community to notice in passing, that although usually residing at considerable distances from their manufacturing establishments, the principals are far from being unmindful of the means necessary to the moral and intellectual culture of their workpeople. In many instances, educational institutions, founded and supported by the owners of these establishments, are attached to the large manufactories, and not seldom enjoy the supervision, either of the principal himself, or of members of his family or firm. In one part of the district under consideration, and formerly perhaps the worst locality within its precincts, several considerable streets of poor insalubrious tenements have been entirely removed to afford space for the erection, of an

extensive religious establishment (episcopal), with commodious schools, reading-rooms, &c., and provided with a well-disciplined staff of teachers. Another similarly endowed establishment, equally commodious and complete, has been planted in a quarter a little distant from the first-named; and a third is in process of erection,—all within the same township, and done at the expense of one firm, the principals of which are members of one and the same family. The amount of outlay necessitated by these highly praiseworthy undertakings must be very considerable. In efforts to further the objects of these institutions, one of the principals has for years past spent, and does continue to devote, the whole of his leisure time, always to the abridgement of his own personal comforts, and not always without prejudice to health.

The tenements of the operatives in the south (the Chorlton), like those of the north-east (the St. George-Ancoats) quarter, already spoken of, are provided with the outside ashpit or cesspool, the inside water-closet being found in the larger dwellings only.

These two quarters numbered in 1861, as before stated, a population of 260,713 persons, four-fifths at least of whom are families who earn their livelihood in the cotton manufactories, warehouses, machine-works, iron and glass foundries, and other collateral and associated branches of industry. A consider-

able number of the town shopkeepers also, whose places of business, like the warehouses, are deserted at night, have residences in the Chorlton quarter.

The whole space occupied by this mass of 260,713 inhabitants amounts to 2,680 acres, giving an apparent density of 97·28, but a computed real density of 100·19 to the acre; and the average death-rate for the ten years ended 1860 was 65·83. This rate of mortality is ·77 per cent above the national average; but when compared with that of other populations of towns usually deemed healthy, the disparity, though variable, is mostly in its favour. For instance, it is lower than that of any county or cathedral town in the kingdom (those of London and Wales not included), with the exception of five only, namely, Oakham, Derby, Huntingdon, Bedford, and Appleby. The average death-rate of these five towns for the ten years ended 1860 is 62·05, being 3·78 per cent lower than that of the Manchester operative districts; but their aggregate population amounts only to 100,713 persons, being less by just 160,000 than the one district alluded to; while their average density is 96 persons to the acre fewer. This sparseness, however, is chiefly confined to four of the towns in question, for the density of Derby is 17·20 to the acre.

The other thirty-five county and cathedral towns, each of which is less favourably circumstanced as

to sanitary conditions than the operative districts alluded to, have an average density of 2·36 persons to the acre, and an average death-rate of 76·83. The respective results may be more clearly comprehended from the following arrangement:

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
5 County Towns	171,207	100,713	·59	62·05
35 other County and Cathedral Towns ...	382,688	901,937	2·36	76·83
Operative Districts of Manchester	2,680	260,713	96·28	65·83

The most central portion of Manchester consists of the three districts—London Road, Deansgate, and Market-street. Their collective population in 1861 was 81,372, occupying an area of 870 acres, giving 93·53 persons to the acre. Their average death-rate, for the same ten years, stands at 81·03, being 15·20 higher than that of the operative districts already examined. It may be reasonably asked: To what agency or combination of conditions is this higher death-rate owing? It cannot be due to the presence of factory operatives, even were it not already proved that factory employment has not the pernicious tendency commonly assigned to it; for this quarter contains not above one-fifth of them. The greatest number of this one-fifth are found within the precincts of London Road; but this district contains also an immense number of second and third-rate shopkeepers of all descriptions,

and the dwellings of operatives employed by the extensive establishments of the London and North-Western, and Manchester, Sheffield, and Lincolnshire Railway Companies, besides bricklayers, joiners, and others plying their occupations in different parts of the town. The Deansgate district contains probably a still smaller proportion of factory operatives, and yet has a death-rate 5 per cent higher than that of London Road. The Market-street district contains but a very minute proportion of this class. Its multitudes of shops (besides warehouses) and its extensive markets, employ the great bulk of its resident poor; but it has also a very large strolling, migratory, and vagrant population.

Neither can the high rate of fatality in this quarter be attributed to agglomeration; for it has been already shown, that the districts which are the most densely crowded are also the most healthy. Other causes of insalubrity must therefore be sought for. Of these agencies I will mention one only, but without assigning to it any importance beyond that which the circumstances to be mentioned may seem to give. It relates to the state of the sewage.

The quarter of the town under consideration, namely, the central part of Manchester, occupies a gently sloping tract of land, bounded on three sides by the rivers Irwell, Irk, and Medlock, into

one or other of which the large sewers empty their loads of refuse. It is not intimated that the effluvia arising from the streams themselves contribute to render the air insalubrious; for, once mixed with the water, which is renewed at every moment, the sewage material becomes innocuous, or nearly so. It is the circumstance of being in close proximity to these which exposes inhabitants so situated to the putrescent products of the large terminal drains, which contain the accumulated refuse of all the more remote parts of the town. In places where the inside water-closet system is most complete, and the drain current sluggish, the evil effect of the sewage seems to be the most severely felt. For, in addition to the ordure which these are intended to receive, immense quantities of vegetable and animal garbage are also thrown in and are liable to lodge, especially in dry seasons, sufficiently long to putrefy and emit gaseous products, which are extremely noxious as well as offensive. These poisonous effluvia regurgitate along the drains and escape upwards through the first imperfectly-valved grids arrived at, polluting the atmosphere for a considerable space around their embouchements, although rarely reaching to any great distance beyond the most approximate apertures. Were the water closets to be used for their intended purpose only, and the grids and and refuse pipes kept effectually valved, and a

liberal *flushing* of the sewers to be frequently practised in dry seasons, the evil would probably be much lessened, if not made to disappear.

The tenanted part of the Market-street district has a higher situation above the river level than that of the other two Districts of this quarter, and a steeper descent for its terminal drainage, hence, perhaps its lower death-rate as compared with that of Deansgate and London Road. If it were not so favoured, its rate of mortality might probably be much higher, seeing that its *actual* density is thirty or forty per acre greater than either of the other two. The position of the two last-named districts being much nearer to the river level, the drain current is more sluggish, and liable to be arrested in its course.

Analogous instances are met with in London, and probably also in other large towns. Take for example the parish of Westminster, comprising the districts of St. John and St. Margaret, the former chiefly inland and on elevated ground, the latter low and on the left bank of the Thames. Deducting the fatalities which occur in its three military hospitals—namely, those of the Grenadier Guards, Coldstream Guards, and Scots Fusileer Guards, and in the Millbank Penitentiary from those of the parish of St. John; and the deaths which occur in the Workhouse, Westminster Hospital, and House of Correction, from those of St. Margaret's,—the

population, acreage-density, and death-rate affecting the permanent inhabitants of the two districts respectively will stand as follows :—

Westminster.

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
St. John.....	260	37,483	144·16	63·85
St. Margaret	657	30,730	46·77	77.74

The Houses of Parliament are situated in the district of St. Margaret, and it was probably the regurgitating air of the large sewers in its concentrated essence that so frequently offended the noses of "honourable members" on recent occasions, and not the effluvia from the river.

Again. The two parishes of Marylebone situated inland, and Chelsea on the river, may be contrasted with similar results. Marylebone, now centrally located and crowded, having a density of 107 to the acre, has a death-rate of 77·41 ; while Chelsea, with an acreage population 34 lower in density, and comparatively suburban, has a death-rate of 77·56. The death-rate difference is certainly not great, but the less crowded state of Chelsea and its external position, ought to render it much more healthy comparatively. The items stand as below :—

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Marylebone	1,509	161,680	107·13	77·41
Chelsea	865	63,439	73·34	77·56

Another still more remarkable instance is furnished by the two districts comprised in the parish

of St. Martin-in-the-Fields—Long Acre, situated inland, and Charing Cross, bordering the river and consequently on the tract of the large drains. Long Acre is notoriously crowded, having a density of population more than six times greater than that of Charing Cross, yet has a death-rate of more than $2\frac{1}{2}$ per cent lower—the fatalities occurring in the Workhouse and Hospital of the latter district having been deducted. The respective items stand as follows :—

St. Martin's.

	Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Long Acre.....	42	11,618	276·62	69·04
Charing Cross ...	263	11,071	42·09	71·80

One example more shall suffice to finish this category. The parish of St. George in the borough of Southwark, situate inland, and the combined parishes of St. Saviour and St. Olave in the same borough, bordering the Thames on its right bank—one above, the other below London Bridge, adjoin each other. The fatalities which occurred during ten years in the Workhouse, Queen's Prison, House of Occupation, and the Bethelem Asylum being deducted from the sum of deaths in the St. George's parish; and those of the two Workhouses, and Guy's and St. Thomas's Hospitals from the general results of St. Saviour and St. Olave, the population, acreage-density, and death-rate

affecting the permanent inhabitants of these two groups respectively, stand as follows:—

		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births
Southwark.	St. George	282	55,510	196·84	65·64
	St. Saviour	419	55,226	131·80	70·81
	St. Olave				

In a report published a few years ago (which I am unable at present to find, nor do I, to my regret, remember the author's name) on the relative healthfulness of occupations in London, it was stated that the Thames watermen enjoyed a very favourable measure of health and duration of life. It is not probable, therefore, that dampness supposed to be charged with noxious effluvia, emitted from a stream which is perpetually renewed by rapid movement, can be a cause of insalubrity in these and similarly situated districts. It is much more probable that, in such instances at least as the preceding, agents of maleficence of great potency may be contained in the products of putrefactive fermentation in the large terminal drains.

It remains to be noticed, that no inconsiderable amount of atmospheric impurity of dwellings is due to the very defective state of household drainage. In all or the great majority of houses in towns, the drains leading from the waterclosets to the main sewers traverse the whole extent of the basement premises, from the extreme back to the front. In every instance these conduits are badly constructed,

being leaky at numerous points of their transit, from which circumstance the subsoil, especially if of porous quality, becomes saturated with pestiferous moisture to a considerable distance below and on each side of the drain, rendering the air of the lower apartments musty and disagreeable, as well as positively baneful to health. There is probably no subject which demands the attention of the sanitary reformer more urgently than this.

In regard to rates of mortality affecting other large manufacturing towns in Lancashire, Cheshire, and the West Riding of Yorkshire, the results will be found to differ but slightly from those given for Manchester. The following list may serve to illustrate, approximatively, the state of salubrity, as denoted by their respective death-rates, of 22 of the chief of these, ranged in the order of their occurrence in the Registrar-General's tables.

In compiling for these several items it seemed probable that an additional means towards estimating the relative healthfulness of manufacturing and agricultural districts, as influenced by employment, might be afforded by placing, in juxta-position with the results for each town, those also of the entire Union of which the respective town forms the centre. For, the suburban populations of growing manufacturing towns are, in most instances, largely engaged in the same branches of pursuits as the

more central masses which they surround; while the populace situated immediately beyond the precincts of county towns (with three or four exceptions*) are as largely so in agricultural and the collateral industries.

Table exhibiting the population, acreage-density, and average death-rate for the ten years ended 1860, of twenty-two manufacturing towns and of their respective Unions—including the fatalities in work-houses, hospitals, and asylums in each instance:—

Towns.		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Stockport.....	Town ...	7,017	41,084	5·85	76·57
	Union ...	30,709	94,360	3·07	73·23
Macclesfield...	Town ...	2,410	27,475	11·40	76·86
	Union...	81,581	61,543	·75	73·37
Wigan	Town ...	2,161	37,558	17·42	69·53
	Union...	47,539	94,561	2·00	63·55
Warrington ...	Town ...	2,507	24,050	9·49	59·89
	Union...	29,981	43,875	1·47	58·48
Leigh	Town ...	3,331	9,449	2·84	64·15
	Union...	23,610	37,700	1·59	65·90
Bolton	Town ...	820	43,431	53·00	71·16
	Union...	43,896	130,269	2·96	64·29
Bury	Town ...	2,370	31,101	13·12	65·06
	Union...	32,990	101,135	3·06	64·05
Manchester ...	Town ...	4,770	413,037	86·60	76·50
	Union...	29,007	518,902	17·88	72·71

* Norwich and Newcastle for instance, and in a less degree, Nottingham and Derby.

Towns.		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Ashton-under-Lyne	Town ...	9,300	41,229	4·43	81·12
	Union...	38,657	134,753	3·49	72·57
Oldham	Town ...	4,617	72,333	15·66	68·12
	Union...	16,872	111,276	6·59	65·88
Rochdale	Town ...	?	38,164	?	69·52
	Union...	40,340	91,754	2·27	66·60
Haslingden ...	Town ...	4,780	10,320	2·16	62·74
	Union...	26,681	69,781	2·61	61·20
Burnley	Town ...	21,448	42,702	2·00	66·84
	Union...	54,126	75,595	1·40	64·31
Blackburn ...	Town ...	3,610	63,126	17·48	69·80
	Union...	43,569	119,942	2·75	65·12
Chorley	Town ...	10,859	18,027	1·70	61·94
	Union...	52,213	41,678	·80	59·78
Preston.....	Town ...	2,753	82,985	30·12	72·88
	Union...	68,035	110,526	1·62	71·80
Huddersfield..	Town ...	3,950	34,877	8·83	66·61
	Union...	66,560	131,336	1·97	58·95
Halifax	Town ...	2,330	36,437	13·63	74·41
	Union...	51,758	128,673	2·48	64·87
Bradford	Town ...	1,680	48,646	28·35	69·83
	Union...	40,334	196,475	4·87	66·28
Leeds	Town ...	2,100	117,556	56·00	73·28
	Union...	42,021	227,514	5·41	67·24
Dewsbury.....	Town ...	1,392	18,148	13·04	64·17
	Union...	24,456	92,883	3·80	59·57
Sheffield	Town ...	3,120	68,981	22·11	73·15
	Union...	10,590	128,951	12·14	67·02

The results presented in the next table, exhibiting corresponding conditions for forty county and cathedral towns, stand in contrast with those of the preceding table, as not containing (with a few exceptions) any large manufacturing industries, and are therefore not incommoded by dense masses of poor people, or the atmospheric impurities arising from manufacturing processes. Fourteen of them, marked with asterisks (*), have no extensive suburban unions, each, or most of them, being complete within its own little county privileges of antique date. Each has at least one Workhouse attached, except Oxford and Appleby, which are the only two of these towns without such a refuge :—

Towns.		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Guildford...	Town ...	5,329	9,443	1·80	72·17
	Union...	65,592	29,330	·45	63·14
Canterbury	*	3,121	16,643	5·36	88·35
Maidstone	Town ...	4,042	23,016	5·70	77·23
	Union...	38,082	38,670	1·02	72·05
Chichester	Town ...	1,830	8,884	4·85	93·09
	Union...	21,054	14,775	·70	83·22
Winchester	Town ...	3,861	14,930	3·86	96·11
	Union...	78,676	26,607	·34	77·32
Hertford ...	Town ...	18,277	11,163	·61	67·51
	Union...	34,410	15,301	·44	63·11
Abingdon...	Town ...	12,983	8,672	·66	68·56
	Union...	56,445	20,861	·37	70·76
Buckingham	Town ...	14,983	5,987	·40	78·14
	Union...	52,419	13,756	·26	69·49

Towns.		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Northampton	Town ...	11,358	37,710	3·32	68·22
	Union...	20,903	41,160	1·97	67·00
Oxford	*	2,930	20,037	6·84	66·34
Huntingdon	Town ...	20,607	9,368	·45	62·56
	Union...	77,180	20,518	·27	57·67
Bedford ...	Town ...	36,727	23,655	·64	64·07
	Union...	97,320	38,072	·39	61·52
Cambridge	*	3,470	26,361	7·59	71·39
Chelmsford	Town ...	3,533	8,664	2·45	80·62
	Union...	83,906	32,765	·39	64·20
Ipswich ...	*	8,395	37,881	4·51	66·02
Norwich ...	*	4,325	74,440	17·21	75·57
Salisbury...	*	480	9,039	18·83	74·21
Dorchester	Town ...	9,830	7,709	·78	75·51
	Union...	115,339	24,773	·21	66·34
Exeter.....	*	1,800	33,724	18·68	90·37
Bodmin ...	Town ...	16,347	6,524	·40	75·64
	Union...	88,981	19,691	·22	63·04
Ely	Town ...	35,884	11,944	·33	65·92
	Union...	79,894	21,910	·28	60·38
Taunton ...	Town ...	3,926	10,283	2·62	73·67
	Union...	70,452	35,601	·56	66·84
Gloucester	Town ...	680	15,214	22·37	70·20
	Union...	32,222	34,950	1·09	66·31
Hereford ...	Town ...	2,417	14,065	5·32	87·62
	Union...	144,991	39,287	·27	76·20
Shrewsbury	*	18,032	25,784	1·43	87·53
Stafford ...	Town ...	17,581	14,739	·84	83·39
	Union...	52,022	24,474	·47	73·78

Towns.		Area in Statute Acres.	Population in 1861.	Persons to the Acre.	Deaths to 100 Births.
Worcester...	*	6,699	30,969	4·62	77·84
Warwick ...	Town ...	5,410	10,589	2·00	76·94
	Union...	66,639	44,047	·66	72·20
Leicester ...	*	3,960	68,190	17·22	68·20
Oakham ...	*	55,030	11,112	·22	61·54
Lincoln ...	Town ...	29,614	24,907	·84	66·46
	Union...	158,920	47,063	·29	60·72
Nottingham	*	1,870	75,765	40·52	75·80
Derby ...	*	2,970	51,049	17·20	64·32
Chester ...	Town ... (Cathedral)	25,222	19,762	·78	81·88
	Union...	107,555	58,501	·54	73·57
Lancaster...	Town ...	13,280	18,347	1·38	81·00
	Union...	138,746	35,297	·25	68·53
York	Town ...	26,456	50,906	1·92	74·00
	Union...	83,430	59,968	·72	70·71
Durham ...	Town ...	27,720	18,714	·67	69·32
	Union...	98,368	70,274	·71	55·68
Newcastle...	*	7,102	110,968	15·62	76·75
Carlisle ...	Town ...	1,1782	31,775	2·70	69·41
	Union...	70,810	44,820	·63	68·03
Appleby ...	Town ...	55,873	5,529	·10	58·28
	Union...	177,910	15,411	·09	62·62

SUMMARY.

Results for the twenty-two Manufacturing Towns and their corresponding Unions:—

1. Aggregate inhabitants of the Towns	1,320,716
„ „ „ Unions.....	2,743,482
2. Average Population of the Towns.....	60,035
„ „ „ Unions	124,704
3. Average Density of the Towns—to the acre...	18·88
„ „ „ Unions— „ ...	3·74
4. Average Death-rate of the Towns—to 100 Births	69·64
Average Death-rate of the Unions—to 100 Births	65.76

Results for the 40 County and Cathedral Towns and the corresponding Unions of 26 of them:—

1. Aggregate inhabitants of the 40 Towns	998,439
„ „ 26 Unions	842,958
2. Average Population of the Towns	24,961
„ „ Unions	32,421
3. Average Density of the Towns—persons to the acre	5·97
Average Density of the Unions—persons to the acre	·49
4. Average Death-rate of the Towns—to 100 Births	75·54
Average Death-rate of the Unions—to 100 Births.....	67·48

MANCHESTER, *May* 23, 1863.