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TWENTY-NINTH  
ANNUAL REPORT

OF THE

REGISTRAR-GENERAL

OF

BIRTHS, DEATHS, AND MARRIAGES

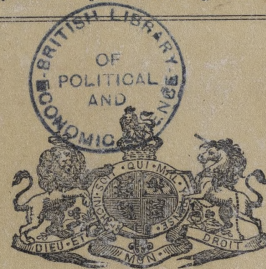
IN ENGLAND.

(ABSTRACTS OF 1866.)

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Presented to both Houses of Parliament by Command of Her Majesty.

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LONDON:  
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,  
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FOR HER MAJESTY'S STATIONERY OFFICE.

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REPORT

TO

The Right Honourable GATHORNE HARDY, M.P., Her Majesty's Principal Secretary of State for the Home Department, &c. &c. &c.

General Register Office, Somerset House,  
31st March 1868.

SIR,

I HAVE the honour to submit to you my Annual Report for the year 1866.

The estimated population for the middle of the year is 21,210,020: and as of this number 10,273,700 are males and 10,936,320 females, there are 662,620 more females than males living in England and Wales.

The natural increase of population by the excess of births over deaths was 253,179, or 694 daily. The number of emigrants who left the ports of the United Kingdom was 204,882 or 561 daily; of these 61,263 were

TABLE 1.—Estimated Population, with the Number of Marriages, Births, and Deaths registered in England, in each Year from 1838 to 1866.

YEARS ended Dec. 31st	Estimated POPULATION in ENGLAND in the Middle of the Years.*	MARRIAGES.	PERSONS MARRIED.	BIRTHS (exclusive of Still-born).	DEATHS	EXCESS OF BIRTHS OVER DEATHS.
1838	15,312,256	118,067	236,134	463,787	342,760	121,027
1839	15,515,296	123,165	246,332	492,574	338,964	153,590
1840	15,721,029	122,665	245,330	502,303	359,687	142,616
1841	15,929,492	122,496	244,992	512,158	343,347	168,811
1842	16,123,793	118,825	237,650	517,739	349,519	168,220
1843	16,320,479	123,818	247,636	527,325	346,445	180,880
1844	16,519,565	132,249	264,498	540,763	356,933	183,830
1845	16,721,081	143,743	287,486	543,521	349,366	194,155
1846	16,925,051	145,664	291,328	572,625	390,315	182,310
1847	17,131,512	135,845	271,690	539,965	423,304	116,661
1848	17,340,492	138,230	276,460	563,059	399,833	163,226
1849	17,552,020	141,883	283,766	578,159	440,839	137,320
1850	17,766,129	152,744	305,488	593,422	368,995	224,427
1851	17,982,349	154,206	308,412	615,865	395,396	220,469
1852	18,193,206	158,732	317,564	624,012	407,135	216,877
1853	18,404,368	164,520	329,040	612,391	412,097	191,294
1854	18,616,310	159,727	319,454	634,405	437,905	196,500
1855	18,829,000	152,113	304,226	635,043	425,703	209,340
1856	19,042,412	159,337	318,674	657,453	390,506	266,947
1857	19,256,516	159,097	318,194	663,071	419,815	243,256
1858	19,471,291	156,070	312,140	655,481	449,656	205,825
1859	19,686,701	167,723	335,446	689,881	440,781	249,100
1860	19,902,713	170,156	340,312	684,048	422,721	261,327
1861	20,119,314	163,706	327,412	696,406	435,114	261,292
1862	20,336,467	164,030	328,060	712,634	436,566	276,118
1863	20,554,137	173,510	347,020	727,417	473,887	253,530
1864	20,772,308	180,387	360,774	740,275	495,531	244,744
1865	20,990,946	185,474	370,948	748,069	490,909	257,160
1866	21,210,020	187,776	375,552	753,870	500,689	253,181

\* The Population of each of the years since 1851 is deduced from the ascertained rate of increase observed in the twenty years, 1841-61; and an allowance is made for the decrease in the rate during the latter ten years. On another hypothesis the numbers would differ slightly from the estimate here given, but as the rates of births, deaths, and marriages have been calculated on these numbers it is not considered advisable to give any other estimate of Population.

of English origin, 12,766 of Scotch, 102,904 of Irish; and 27,949 were Foreigners, chiefly Germans, Norwegians, and Swedes. The 8138 persons, whose birth place was not recorded, are distributed proportionally in this statement. Of the emigrants 161,000 went to the United States, 13,255 to British North American Colonies, 24,097 to the Australian Colonies, and 6530 to various other places. Tables showing the occupation, sex, and ages of these emigrants are given at pages lxvi-lxviii.

The sum of 498,000l. was remitted, through banks and mercantile houses, during the year by settlers in North America to their friends in the United Kingdom: this amount, which is the largest since 1860, being in addition to sums sent through private hands.

The number of persons married was 375,552; 753,870 children were born alive, and 500,689 persons died in the year; under each of these heads the number is greater than in any previous year.

One million six hundred and thirty thousand one hundred and eleven inscriptions of names were placed on the registers of this office, raising the total number since the commencement of registration in 1837 to thirty-eight millions eight hundred and thirty-three thousand seven hundred and fifty-two names of persons who have experienced one or more of the three great events of birth, marriage, or death, in 29½ years.

The temperature of the year at the Royal Observatory, Greenwich, was 49.8°, or 0.5° above the average; the rain-fall amounted to 30.7 in., which is 6.8 in. more than the average. The price of wheat rose from 45s. 6d. per quarter in the first three months to 56s. 8d. in the last quarter of the year.

MARRIAGES.

187,776 marriages were solemnized in the year; 146,040 or 78 per cent. according to the rites of the Established Church, and 41,736 or

TABLE 2.—Proportion of Marriages, Births, and Deaths to the Population of England, in each Year from 1838 to 1866.

Table with columns for Years ended Dec. 31st, To 100 Persons Living (Marriages, Persons Married, Births, Deaths), and The Number of Persons Living (To one Marriage, To one Person Married, To one Birth, To one Death). Rows range from 1838 to 1866 and a mean row.

NOTE.—The Table may be read thus:—In the year 1838 to every 100,000 persons living there were 771 marriages or 1542 persons married, 3029 births, 2238 deaths; the number of persons living to every marriage, person married, birth or death, was 130, 65, 33, and 45 respectively. A correction for increase of population has been made in calculating the above results.

22 per cent. not according to the rites of the Established Church. 20,297 marriages were by licence, 118,274 after banns, 4281 on superintendent registrar's certificate; and in 3171 instances it is not stated under which of these heads the marriages should be placed. In Roman Catholic chapels there were 8,911 marriages, in the registered places of other Christian denominations 17,215 marriages; and in the offices of Superintendent Registrars 15,246. The 63 nuptial celebrations among Quakers

TABLE 3.—Marriages registered in England in each Year from 1841 to 1866.

Complex table with multiple columns: Years ended 31st December, Total Marriages, According to the Rites of the Established Church (Special Licence, Licence, Banns, Superintendent Registrar's Certificate, Not stated, Total in Established Church), Not According to the Rites of the Established Church (Total not in Established Church, Roman Catholics, Other Christian Denominations, Superintendent Registrar's Office, Quakers, Jews). Rows range from 1841 to 1866.

\* In the case of mixed marriages between Protestants and Roman Catholics some couples are married twice, and are counted twice in the Registers.

are 9 in excess of the previous year, and the 301 marriages of Jews show a diminution of 52.

The marriages were above the average: the increase in the number of persons married which was noticed in 1863, augmented in each following year, and reached the high proportion of 1.770 persons married in 1866 to every 100 persons living, the average rate being 1.652. The excess in the number of marriages was spread over the first nine months of the year; the commercial distress, which began to be severely felt in May, influenced the marriage-rate in the last three months of the year, when it fell below that of the corresponding season of 1865. 832 in 100,000 persons living may be estimated to represent the marriage-rate of the higher and middle classes, and 895 in 100,000 the marriage-rate among the other classes of the community.

TABLE 4.—Proportion of Marriages and comparison of those celebrated by Licence and not by Licence, together with the Price of Wheat per Quarter in England in each Year from 1841 to 1866.

YEARS.	MARRIAGES.		Proportional Number of Marriages.		PRICE OF WHEAT PER QUARTER.
	To 100 PERSONS LIVING.	BY Banns TO ONE MARRIAGE BY LICENCE.	BY LICENCE to every 100 Persons living in Houses of Rentals of £20 and upwards.	NOT BY LICENCE to every 100 Persons living in Houses of Rentals under £20.	
AVERAGE :					s. d.
Of 8 years of highest prices -	.804*	4.979	.910	.787	64 11
Of 9 years of intermediate prices -	.836	5.449	.881	.829	52 1
Of 9 years of lowest prices -	.850	5.504	.877	.846	42 1
1855	.808	4.883	.916	.791	74 8
1854	.858	4.991	.958	.842	72 5
1847	.793	4.977	.909	.774	69 9
1856	.837	4.888	.947	.819	69 2
1841	.769	4.940	.905	.747	64 4
1842	.737	5.072	.847	.719	57 3
1857	.826	4.803	.944	.807	56 5
1862	.807	5.279	.853	.799	55 5
1861	.814	5.125	.880	.803	55 4
1846	.861	5.427	.926	.850	54 8
1853	.894	5.293	.957	.884	53 3
1860	.855	5.240	.913	.846	53 3
1844	.801	5.705	.831	.796	51 3
1845	.860	5.799	.880	.856	50 10
1848	.797	5.121	.890	.782	50 6
1843	.759	5.490	.816	.749	50 1
1866	.885	5.827	.832	.895	49 11
1863	.844	5.678	.848	.844	44 8
1849	.808	5.429	.859	.800	44 3
1858	.802	5.058	.881	.789	44 3
1859	.852	5.296	.904	.844	43 10
1865	.884	5.634	.856	.889	41 9
1852	.873	5.472	.913	.866	40 9
1850	.860	5.666	.880	.857	40 3
1864	.868	5.714	.865	.869	40 2
1851	.858	5.591	.884	.853	38 6

\* Disregarding the decimal point, this will read:—804 marriages were celebrated to every 100,000 of the population; 910 in 100,000 represent the marriage-rate of the higher and middle classes, and 787 in 100,000 the marriage-rate among the other classes of the community.

There were 23 marriages in which one or other of the contracting parties is stated to have been previously divorced, thus 9 divorced men married spinsters, 5 divorced men married widows, 8 bachelors and one widower married divorced women; these numbers are considerably less than in the previous year, when there were 48 cases of marriage after divorce.

*Buildings registered for marriage.*—There were 5576 buildings for the solemnization of marriages on the register at the end of the year 1866; of these 1666 belonged to Independents, 1163 to Baptists, 1317 to Wesleyan Methodists (including 673 of the original connection, and 233 Primitive Methodists), 626 belonged to Roman Catholics, 168 to Unitarians, 166 to Scottish Presbyterians, and 272 to Calvinistic Methodists.

15,979 places of meeting for public worship in England and Wales were on the register on 31st December 1866, and the following is a list of the various titles by which the religious denominations have been certified to me.

Apostolics.	Free Gospel Church.	Ranters.
Armenian New Society.	Free Church (Episcopal).	Reformers.
Baptists.	Free Church of England.	Reformed Presbyterians or
Baptized Believers.	Free Union Church.	Covenanters.
Believers in Christ.	General Baptist.	Recreative Religionists.
Bible Christians.	General Baptist New Con-	Refuge Methodists.
Bible Defence Association.	nexion.	Reform Free Church of
Brethren.	German Lutheran.	Wesleyan Methodists.
Calvinists.	German Roman Catholic.	Revivalists.
Calvinistic Baptists.	Glassites.	Revival Band.
Catholic and Apostolic	Greek Catholic.	Roman Catholics.
Church.	Hallelujah Band.	Salem Society.
Christians.	Independents.	Sandemanians.
Christians who object to be	Independent Religious Re-	Scotch Baptists.
otherwise designated.	formers.	Second Advent Brethren.
Christian Believers.	Independent Unionists.	Separatists (Protestant).
Christian Brethren.	Inghamite.	Seventh Day Baptists.
Christian Eliasites.	Jews.	Strict Baptists.
Christian Israelites.	Latter Day Saints.	Swedenborgians.
Christian Teetotallers.	Modern Methodists.	Testimony Congregational
Christian Temperance Men.	Mormons.	Church.
Christian Unionists.	New Connexion of Wes-	Trinitarians.
Church of Scotland.	leyans.	Union Baptists.
Church of Christ.	New Jerusalem Church.	Unionists.
Countess of Huntingdon's	New Church.	Unitarians.
Connexion.	Old Baptists.	Unitarian Christian.
Disciples in Christ.	Original Connexion of Wes-	United Christian Church.
Eastern Orthodox Greek	leyans.	United Free Methodist
Church.	Plymouth Brethren.	Church.
Eclectics.	Peculiar People.	United Brethren or Mora-
Episcopalian Dissenters.	Presbyterian Church in Eng-	vians.
Evangelical Unionists.	land.	United Presbyterians.
Followers of the Lord Jesus	Primitive Methodists.	Unitarian Baptists.
Christ.	Progressionists.	Welsh Calvinistic Methodists.
Free Catholic Christian	Protestants adhering to Arti-	Welsh Free Presbyterians.
Church.	cles of Church of England,	Wesleyan Methodist Asso-
Free Christians.	1. to 18. inclusive, but re-	ciation.
Free Church.	jecting Order and Ritual.	Wesleyan Reformers.
Free Grace Gospel Chris-	Providence.	Wesleyan Reform Glory
tians.	Quakers.	Band.

*Re-marriages.*—26,128 widowers and 17,651 widows re-entered the marriage state during the year; of the widowers 16,467 married spinsters and 9661 married widows; the remaining 7990 widows were allied to bachelors.

*Marriages of Minors.*—12,569 men and 37,610 women married under the age of 21 years; of men, the proportion who married under age, was 6.69; of women 20.03 in 100. The prevalence of early marriages differs considerably in the several counties, and is always greatest in those

centres of industry which afford employment for young persons; thus the early marriages of straw plait and lace makers raise the proportion of men to 11.5 and women to 24.2 per cent. in Buckinghamshire, and to 11.7 men and 25.7 women per cent. in Bedfordshire; in Leicestershire the proportions are 11.6 men and 23.5 women; Nottinghamshire, 10.4 men and 23.1 women; in Durham, 7.9 in every 100 men, and 30.2 in every 100 women marry under the age of 21. In London the proportion of early alliances is always small, owing, among other causes, to the cost of house accommodation, and the more exacting requirements of social position; 3.5 in 100 men and 14.3 in 100 women married under age in the metropolis.

*Signature of Marriage Registers.*—Of the 187,776 men and 187,776 women who married during the year 1866, 40,609, or 21.6 per cent. of men, and 56,395, or 30.0 per cent. of women signed the registers with marks. High as these proportions are it is nevertheless gratifying to observe that a progressive decrease is shown in the returns. Twenty years since one third of the men and half of the women were unable to attach their names to the record of their marriage. Examined by the test of the marriage registers the women in most of the agricultural districts appear to have had a better elementary education than the men, while the reverse is the case in the manufacturing and mining districts, and also in Wales, where little more than half the women write their names. In the following counties the women sign their names in a greater proportion than the men, viz., Surrey, Kent, Sussex, Berkshire, Middlesex, Hertfordshire, Oxfordshire, Huntingdonshire, Essex, Suffolk, Norfolk, Wiltshire, Dorsetshire, Somersetshire, Herefordshire, Rutlandshire, and Lincolnshire.

Scotland compares very favourably with England in elementary education, as represented by marriage signatures, although little or no progress is shown in this respect; for while 11.4 in every 100 men and 22.2 in every 100 women signed the registers with marks in Scotland in 1865, the respective proportions in 1855 were 11.4 and 22.8; in England the

TABLE 5.—Marriages in England. The Proportion per Cent. of Minors of each Sex, of Males and Females who signed the Register with Marks, and of Persons who were Widowers or Widows, in each Year from 1841 to 1866.

YEARS ended 31st December	TO 100 MARRIAGES.								
	THE PROPORTION UNDER 21 YEARS OF AGE.			THE PROPORTION WHO SIGNED THE MARRIAGE REGISTER WITH MARKS.			THE PROPORTION WHO WERE		
	Males.	Females.	Mean.	Males.	Females.	Mean.	Widowers.	Widows.	Mean.
1841	4.38	13.29	8.83	32.7	48.8	40.8	*12.90	*8.99	*10.95
1842	4.53	13.47	9.00	32.0	47.9	40.0	13.14	8.90	11.02
1843	4.45	13.25	8.85	32.7	49.0	40.9	13.17	8.73	10.95
1844	4.17	13.16	8.67	32.4	49.2	40.8	12.81	8.46	10.63
1845	4.37	13.48	8.93	33.2	49.6	41.4	12.64	8.60	10.62
1846	4.33	13.73	9.03	32.6	48.2	40.4	12.59	8.33	10.46
1847	4.09	13.34	8.72	31.2	45.5	38.4	12.93	8.54	10.74
1848	4.41	14.06	9.24	31.2	45.4	38.3	13.76	8.86	11.31
1849	4.69	14.88	9.79	31.0	45.9	38.5	13.85	8.88	11.37
1850	4.88	15.13	10.01	31.1	46.2	38.7	14.49	9.27	11.88
1851	5.02	15.75	10.39	30.8	45.3	38.1	13.98	9.00	11.49
1852	5.39	16.99	11.19	30.5	44.6	37.6	13.49	8.86	11.18
1853	5.55	17.76	11.66	30.4	43.9	37.2	13.59	8.97	11.28
1854	5.77	18.03	11.90	30.0	42.7	36.4	13.62	9.01	11.32
1855	5.51	17.89	11.70	29.5	41.2	35.4	14.42	9.49	11.96
1856	5.72	18.34	12.03	28.8	40.2	34.5	13.94	9.36	11.65
1857	5.58	18.10	11.84	27.7	38.8	33.3	13.75	9.11	11.43
1858	5.86	18.37	12.12	27.0	37.6	32.3	14.22	9.20	11.71
1859	6.20	19.10	12.65	26.7	37.6	32.2	14.10	9.07	11.59
1860	6.35	19.35	12.85	25.5	36.2	30.9	13.88	9.03	11.46
1861	6.36	19.50	12.93	24.6	34.7	29.7	14.03	9.12	11.58
1862	6.47	19.79	13.13	23.7	33.2	28.5	13.69	8.98	11.34
1863	6.61	19.90	13.26	23.8	33.1	28.5	13.54	8.82	11.18
1864	6.62	20.09	13.36	23.3	32.4	27.9	13.84	9.07	11.46
1865	6.69	20.08	13.39	22.5	31.2	26.9	13.93	9.24	11.59
1866	6.69	20.03	13.36	21.6	30.0	25.8	13.91	9.40	11.66

\* The proportion of Widowers and Widows in the Year 1841 is for the September and December quarters only.

proportions, which in 1855 were as high as 29.5 per cent. of men and 41.2 per cent. of women, diminished to 21.6 per cent. of men and 30.0 of women signing with marks in 1866. In Scotland the rate varied in

TABLE 6.—Proportional Number of Marriages in the several Counties of England during the Year 1866; of Persons who signed their Names; of Persons not of full Age; and of the Re-marriages of Widowers and Widows.

REGISTRATION COUNTIES.	MARRIAGES TO 100 PERSONS LIVING.	SIGNED THEIR NAMES IN WRITING.		PERSONS NOT OF FULL AGE.		RE-MARRIAGES.	
		Of 100 Men Married.	Of 100 Women Married.	In 100 Men Married.	In 100 Women Married.	WIDOWERS.	WIDOWS.
						In 100 Men Married.	In 100 Women Married.
ENGLAND	.885	78.4	70.0	6.69	20.03	13.91	9.40
I.—LONDON	1.106	90.2	84.9	3.49	14.25	13.69	9.46
II.—SOUTH EASTERN COUNTIES.							
1 Surrey (extra-metropolitan)	.706	81.5	85.7	2.88	15.31	11.76	8.03
2 Kent (extra-metropolitan)	.810	80.4	81.6	4.65	22.71	12.14	9.13
3 Sussex	.816	80.7	86.1	5.73	18.21	12.51	7.98
4 Hampshire	.819	84.1	83.6	4.39	18.58	12.08	10.02
5 Berkshire	.735	75.2	80.4	5.30	17.59	15.24	10.07
III.—SOUTH MIDLAND COUNTIES.							
6 Middlesex (extra-metropolitan)	.606	83.1	85.9	4.62	16.46	11.54	8.49
7 Hertfordshire	.660	66.6	72.7	9.55	19.61	11.58	8.28
8 Buckinghamshire	.693	69.1	66.1	11.48	24.22	13.81	8.37
9 Oxfordshire	.752	77.7	81.0	6.58	19.36	13.71	6.51
10 Northamptonshire	.731	77.5	75.1	9.25	22.64	13.56	8.34
11 Huntingdonshire	.680	67.8	69.8	8.54	22.86	16.08	7.29
12 Bedfordshire	.818	67.5	60.5	11.73	25.68	15.41	6.42
13 Cambridgeshire	.696	72.9	71.3	8.96	23.29	14.17	8.06
IV.—EASTERN COUNTIES.							
14 Essex	.625	71.0	75.6	8.01	24.12	12.18	9.28
15 Suffolk	.707	67.5	73.8	7.60	19.81	15.63	9.38
16 Norfolk	.753	67.9	73.2	8.67	20.66	15.12	9.67
V.—SOUTH WESTERN COUNTIES.							
17 Wiltshire	.713	75.1	77.8	8.15	16.18	14.86	8.64
18 Dorsetshire	.721	78.4	79.1	7.12	15.68	13.18	7.50
19 Devonshire	.835	82.4	78.0	5.31	15.99	12.46	8.64
20 Cornwall	.676	74.0	65.2	7.90	21.60	12.26	6.99
21 Somersetshire	.723	73.8	74.4	9.01	16.35	14.86	8.86
VI.—WEST MIDLAND COUNTIES.							
22 Gloucestershire	.930	79.5	78.0	7.71	18.11	14.15	8.56
23 Herefordshire	.630	71.0	78.8	4.08	14.35	14.49	10.83
24 Shropshire	.682	69.4	67.4	3.98	13.35	12.86	10.03
25 Staffordshire	.869	64.6	55.5	10.26	29.43	12.80	10.04
26 Worcestershire	.787	74.9	69.1	7.05	21.04	12.02	8.86
27 Warwickshire	.833	76.6	69.1	8.13	22.06	14.31	10.08
VII.—NORTH MIDLAND COUNTIES.							
28 Leicestershire	.923	78.1	71.5	11.64	23.51	12.84	7.70
29 Rutlandshire	.639	80.0	84.7	3.33	16.67	15.33	5.33
30 Lincolnshire	.764	78.5	79.4	4.80	18.99	13.19	7.12
31 Nottinghamshire	.824	76.4	68.0	10.38	23.10	14.89	8.74
32 Derbyshire	.831	77.1	72.3	8.97	24.36	15.55	10.19
VIII.—NORTH WESTERN COUNTIES.							
33 Cheshire	.829	76.3	62.2	5.99	17.59	15.87	9.37
34 Lancashire	1.015	76.5	64.7	8.03	20.97	15.31	10.43
IX.—YORKSHIRE.							
35 West Riding	.993	77.6	60.4	8.77	26.07	14.88	10.18
36 East Riding (with York)	1.008	84.7	74.1	6.10	23.66	14.14	8.99
37 North Riding	.777	83.0	77.5	4.30	20.53	13.25	7.34
X.—NORTHERN COUNTIES.							
38 Durham	.876	75.0	62.4	7.94	30.17	13.08	10.94
39 Northumberland	.994	84.9	73.6	4.73	17.94	12.19	9.40
40 Cumberland	.778	82.4	70.2	4.91	16.89	11.43	7.02
41 Westmorland	.652	85.5	82.8	3.92	14.71	12.75	4.90
XI.—MONMOUTHSHIRE AND WALES.							
42 Monmouthshire	.904	63.2	54.0	7.00	22.63	13.35	10.80
43 South Wales	.842	68.1	50.1	6.48	18.48	13.15	9.00
44 North Wales	.734	67.1	54.0	4.23	12.68	16.32	9.45

The Table may be read thus by omitting the decimal points:—In England, among every 100,000 persons living 885 marriages took place; of 1,000 men married 784, of 1,000 women 700, signed the marriage register by writing their names; of 10,000 men married 669 were not of full age, of 10,000 women married 2003 were not of full age; of 10,000 men married 1391 were Widowers, of the same number of women married 940 were Widows.





cent.; the average rate since the commencement of registration is 3.357 per cent. In each of the last eight years the birth-rate has been considerably above the average.

As in previous years, Durham exhibits the highest birth-rate (4.337 per cent.), while, as hertofore, Herefordshire has the minimum rate (2.878 per cent.); in London the rate (3.577 per cent.) is somewhat in excess of that of England generally.

Sex.—Males were born to females in the proportion of 104.3\* to 100; this proportion is remarkably uniform in each year in England, the average of 10 years being 104.5, and it is never less than 104 males to every 100 females. The proportion of the sexes varies somewhat in different counties, thus, on an average, it is highest, 106.2 males, in North Wales; Huntingdon next follows, with a proportion of 106.1 males; then follow Norfolk, 105.8; Cornwall, 105.8; Leicestershire, 105.8; Northumberland, 105.8; Monmouthshire, 105.8; and Suffolk, 105.7. The lowest average proportions are in Buckinghamshire, 102.8; Hertfordshire, 102.9; Berkshire, 103.2; North Riding of Yorkshire, 103.6; and London, 103.7.

Taken by groups, the average proportion of males born to females is highest in the northern counties, 105.3; then follow the eastern counties, 105.2; Monmouthshire and Wales, 105.1; north-western counties, 104.7; south-western and north-midland groups each show an average of 104.6; south-eastern counties, 104.5; south-midland counties, 104.5; Yorkshire 104.2; and the west-midland counties 104.1 males to every 100 females born. Examined year by year the proportion in each county varies, by a law well known to those versed in the doctrine of chances, in proportion to the extent of the facts; thus, in Rutlandshire, where the annual number of births is only about 700, the proportion of the sexes born varied from 114.6 males to every 100 females in 1864 to 97 males to 100 females in 1862. Of ten consecutive years the males born in this county exceeded

TABLE 9.—Births in the Years 1845-66 in England, distinguishing the Legitimate and Illegitimate, and the Proportion of Males born to every 100 Females born.

Table with 8 columns: YEARS, BIRTHS REGISTERED (TOTAL, LEGITIMATE, ILLEGITIMATE), Males born to every 100 Females born., Males born in Wedlock to every 100 Females so born., Males born out of Wedlock to every 100 Females so born., Children born out of Wedlock to every 100 Births. Rows for years 1845 to 1866.

\* The proportion of sexes born is a subject of interest, and authentic information on the law prevailing among different animals would furnish a valuable contribution to physiology.

the females in five years, and in the remaining five years the females born exceeded the males; the average of the period, however, exactly coincides with that for England, and shows a proportion of 104.5 males born to every 100 females. In Staffordshire, Warwickshire, Lancashire, and Yorkshire, where the number of births is large, the yearly variation in the proportion is less observable.

TABLE 10.—Number and Proportion of Male and Female Children born in and out of Wedlock in the several Counties of England during the Year 1866.

Large table with 13 columns: REGISTRATION COUNTIES, MALE CHILDREN BORN, FEMALE CHILDREN BORN, BORN IN WEDLOCK (Males, Females), BORN OUT OF WEDLOCK (Males, Females), MALES born to every 100 FEMALES born., MALES born in Wedlock to every 100 FEMALES so born., MALES born out of Wedlock to every 100 FEMALES so born., CHILDREN born out of Wedlock to every 100 Births. Rows for ENGLAND, LONDON, SOUTH EASTERN COUNTIES, SOUTH MIDLAND COUNTIES, EASTERN COUNTIES, SOUTH WESTERN COUNTIES, WEST MIDLAND COUNTIES, NORTH MIDLAND COUNTIES, NORTH WESTERN COUNTIES, YORKSHIRE, NORTHERN COUNTIES, MONMOUTHSHIRE AND WALES.

In Scotland and in Ireland the proportion of males born is higher than in England, thus, in the year 1866 there were 104.3 males to every 100 females born in England, 105.9 in Ireland, and 105.7 in Scotland. In France the returns during the 44 years, 1817-60, show that there were 106 males born to 100 females.

TABLE 11.—Number and Proportion of Male and Female Children born in the several Counties of England in each of the TEN YEARS 1857-66.

Table with columns: REGISTRATION COUNTIES, AVERAGE ANNUAL NUMBER of CHILDREN born in the 10 Years 1857-66 (Males, Females), and MALES BORN TO EVERY 100 FEMALES BORN (1857-1866, Mean of the 10 Years 1857-66). Rows include ENGLAND, I.—LONDON, II.—SOUTH EASTERN COUNTIES, III.—SOUTH MIDLAND COUNTIES, IV.—EASTERN COUNTIES, V.—SOUTH WESTERN COUNTIES, VI.—WEST MIDLAND COUNTIES, VII.—NORTH MIDLAND COUNTIES, VIII.—NORTH WESTERN COUNTIES, IX.—YORKSHIRE, X.—NORTHERN COUNTIES, XI.—MONMOUTHSHIRE AND WALES.

Seasons.—In the first quarter of the year 196,753 births were registered, in the second quarter 192,427, in the third quarter 179,096, and in the last quarter 185,594. If the average number of births in a quarter be represented by 1000, then there were in the first quarter 1058, in the second 1023, in the third 942, and in the last quarter 977: these proportions are higher than usual in the first and last quarters, and lower in the second and third quarters of the year.

Children born out of Wedlock.—The number of illegitimate births registered was 45,501, of which 23,285 were births of males and 22,216

TABLE 12.—Births to 100 Persons living in the several Counties of England during each of the Years 1856-66.

Table with columns: REGISTRATION COUNTIES, BIRTHS TO 100 PERSONS LIVING (1856-1866, Average Annual Rate, 1856-65), and 1866. Rows include ENGLAND, I.—LONDON, II.—SOUTH EASTERN COUNTIES, III.—SOUTH MIDLAND COUNTIES, IV.—EASTERN COUNTIES, V.—SOUTH WESTERN COUNTIES, VI.—WEST MIDLAND COUNTIES, VII.—NORTH MIDLAND COUNTIES, VIII.—NORTH WESTERN COUNTIES, IX.—YORKSHIRE, X.—NORTHERN COUNTIES, XI.—MONMOUTHSHIRE AND WALES.

those of females. Of every 100 births in England six were those of children born out of wedlock ; this proportion is somewhat less than in recent years, it was 6.2 in 1865, 6.4 in 1864, and 6.5 in 1863. Cumber-

TABLE 13.—Proportional Number of Births in each Quarter to 1000 Births in the Average Quarter of each Year, 1838-66.

Table with 7 columns: YEARS, NUMBER OF BIRTHS IN THE AVERAGE QUARTER, and PROPORTIONAL NUMBER OF BIRTHS (subdivided into In the AVERAGE QUARTER, FIRST QUARTER, SECOND QUARTER, THIRD QUARTER, FOURTH QUARTER).

TABLE 14.—Births and Deaths registered in England in each Quarter of the Years 1838 to 1866.

Table with 9 columns: YEARS, BIRTHS (March, June, September, December), and DEATHS (March, June, September, December).

land shows the high illegitimate birth-rate of 11.5 out of every 100 children born, in Norfolk it was 10.3, Westmorland 9.7, Herefordshire and Nottinghamshire 9.1, Shropshire and the North Riding of Yorkshire 8.9, and in Bedfordshire 8.2. The lowest rates were in London and counties immediately surrounding, thus it was in Middlesex 3.8, London 4.1, Surrey 4.2, Kent 4.5. In Durham there were 4.9 illegitimate births in every 100, in Warwickshire and Monmouthshire there were in each 5.0, in Huntingdonshire 5.1, Essex 5.2, and in Gloucestershire 5.3.

In Scotland in the year 1866 the illegitimate birth-rate was 10.1 in every 100 births; it was higher (10.5) in the rural than in town districts (9.9); the rate varied from 16.1 per cent. in Banff and Aberdeenshire to 4.5 in Sutherland and Shetland.

The proportion of males to females born is higher amongst illegitimate births than amongst the legitimate, although from being fewer in number they exhibit in different years greater variation in the proportion of the sexes than is shown in the case of legitimate children; there were thus 106.3 males to every 100 females in England born out of wedlock in 1863, while in 1860 the proportion was 102.9. On an average of the 10 years, 1857-66, there were of illegitimate children 104.8 males to 100 females born, while during the same period there was an annual average of 104.5 males to every 100 females born in wedlock. In the year 1866 there were 104.8 males to 100 females born out of wedlock, and 104.3 males to 100 female children born in wedlock.

TABLE 15.—Annual Rate of Mortality of Males and of Females in England, 1838-66.

Table with 5 columns: YEARS, DEATHS (OF MALES TO 100 MALES LIVING, OF FEMALES TO 100 FEMALES LIVING), DEATHS OF MALES TO 100 FEMALES, and OF EQUAL NUMBERS LIVING, THE NUMBER OF MALE DEATHS TO EVERY 100 DEATHS OF FEMALES.

The Table may be read thus:—In the year 1838 to every 100 males living there were 2.342 deaths of males; to every 100 females living there were 2.146 deaths of females; and to every 100 females who died there were 105 deaths of males. The last column shows the relative mortality of males and females; and that out of equal numbers living the deaths of males were 109 to every 100 deaths of females in 1838.

DEATHS.

In 1866 the population of England had grown to twenty-one millions; and with it had grown to proportionably great dimensions that conscription in the registers of mortality to which each individual life, by a supreme law, makes its inevitable contribution. The number of deaths

TABLE 16.—Annual Rate of Mortality per Cent. in the several Counties of England during each of the Years 1856-66.

Table with columns for Registration Counties, Years (1856-1866), and Average Annual Rate (1856-65). Rows include ENGLAND, LONDON, SOUTH EASTERN COUNTIES, SOUTH MIDLAND COUNTIES, EASTERN COUNTIES, SOUTH WESTERN COUNTIES, WEST MIDLAND COUNTIES, NORTH MIDLAND COUNTIES, NORTH WESTERN COUNTIES, YORKSHIRE, and NORTH WESTERN COUNTIES.

registered in 1866 was about half a million. It is sufficiently near the truth, as a general statement, to observe that in the series of years, 1838-66, population, marriages, births, and deaths have attained numerical values each greater by half than that which had been attained at the beginning of that period. The number of deaths of males in 1866 was 256,402, of females 244,287; the total 500,689.

The rate of mortality in 1866 was 2.361 per cent. of population against an average of 2.224. The year 1860 was healthy, and its death-rate was but little above 2.1. In the two subsequent years it was still below 2.2. In the four succeeding years the death-rate rose above 2.3. Although cholera prevailed in London, Liverpool, Swansea, Neath, and other places in 1866, the mortality from all causes exceeded in no remarkable degree the average in the third quarter, and was hardly above it in the fourth. If that epidemic had not been in England, the latter half of the year would have been comparatively healthy in succession to an unhealthy spring.

In the healthiest year of the series, 1838-66, which was 1856, there was one death to 49 persons living; in the two healthy years 1845 and 1850 there was one to 48; in the three years 1843, 1860, and 1862 there was one to 47; the last four years were unhealthy, and one death has occurred out of every 42 or 43 persons living. The deaths registered do not include those of still-born children.

Seasons.—In the winter quarter (ended 31st March) the deaths were 138,136. In the spring quarter (ended 30th June) 128,551. In the summer quarter (ended 30th September) 116,650. In the autumn quarter (ended 31st December) 117,352.

If the deaths in the year had been 1000, and the same proportions maintained as above, the numbers would have been in the successive quarters 276, 257, 233, and 234.

TABLE 17.—ENGLAND. Mortality per Cent. at different Ages.—Males.\*

Table showing mortality rates for males at various ages (0-95+) across different years (1838-66, 1841-50, 1851-60, 1838-40, 1841-45, 1846-50, 1851-55, 1856-60, 1861-65). Includes sub-sections for Mean of 29 Years, Means of 10 Years, and Means of 5 Years.

\* For mode of reading this Table, see Note to Table 18.

NOTE.—The Population used in the above calculations is now deduced from the ascertained rate of increase observed in the 20 Years 1841-61.



that of females, that 112 males would have died for 100 females; the average proportion under the assumed condition being 108.

Death-rates in counties, and in town and country.—In none of the counties was the mortality so high as in Lancashire, where, taking the better with the worse parts, it was 3.016 per cent. against an average of 2.597. In all other counties it was under 2.70 per cent., having ranged in these from 1.74 in Westmorland and Herefordshire, and 1.78 in Rutlandshire to 2.68 in the West Riding of Yorkshire. In Northumberland the death-rate was 2.577 against an average of 2.240; in Cheshire 2.538 against 2.236. In the following counties and extra-metropolitan portions of counties it was 1.82 per cent., and under 2.00, Surrey, Huntingdonshire, Hertfordshire, Dorsetshire, Suffolk, Wiltshire, Lincolnshire, Cornwall, Sussex, Kent, Oxfordshire, Northamptonshire, Buckinghamshire, Shropshire, Hampshire, and Worcestershire. The rate of mortality in the metropolis was 2.648 against an average of 2.359 per cent. London, within whose bounds are grimy districts covered with dense populations, and parks or suburban fields adorned with terraces and villas, produces an annual rate of mortality, which on the average corresponds very closely with that which is attained in the West Riding of Yorkshire, with its busy manufacturing towns, and its tracts of clear, open country.

TABLE 20.—ENGLAND. Annual Rates of Mortality per Cent. of Females at different Ages, 1838-66.

Table with columns: YEARS., DEATHS TO 100 LIVING., AGES.—FEMALES. (0-95 and upwds.). Rows list years from 1838 to 1866 with corresponding mortality rates for various age groups.

If ten English towns are selected for comparison, it will be seen that the borough of Liverpool was the most unhealthy in 1866; for by a malignant fever in winter, and cholera in summer, the mortality of the year was raised to 4.185, while that of Manchester was 3.195. In the summer quarter cholera raised the death-rate of that borough to 5 per cent.

Ages.—Of 256,402 deaths of males at all ages, 108,424 occurred under 5 years of age, of which 66,851 were those of children who had not completed their first year of existence. In the period of life 5-15 years the deaths of males were 15,117; at 15-25 they were 15,010; at 25-35 they were 16,328; at 35-45 they were 17,463; at 45-55 they were 18,940; at 55-65 they were 20,894; at 65-75 they were 22,711; at 75-85 they were 17,068; at 85-95 they were 4,249; while 198 men died at the age of 95 years and upwards. Starting from the age of five years, it appears that the absolute numbers in the first two decennia were almost equal; in the next and following decennia they constantly increased up to 75 years, at which age the males living had become so few, rari nantes in gurgite, that the deaths, notwithstanding an increased rate of mortality, became less numerous absolutely than in the three previous stages.

Of 244,287 deaths of females, 94,595 occurred under 5 years of age, of which 53,448 were those of infants less than one year old. In the decennium 5-15 years 14,200 girls died; in the next 15-25 years, 15,805 women died; at 25-35 years, 17,454; at 35-45 years, 16,940; at 45-55 years, 16,258; at 55-65 years, 19,176; at 65-75 years, 23,426; at 75-85 years, 19,958; at 85-95 years, 6,059; and at 95 years and upwards, 416 nonagenarians and centenarians died. Thus, after the age 5-15 there was an increase up to the period 35-45; then in two decennia a decrease; then in the two following decennia an increase; at 75-85 a decrease, which continued with increasing rapidity towards that extreme point of age where all human life, that is mortal, is extinguished.

TABLE 21.—Proportional Number of Deaths in each Quarter to 1000 Deaths in the Average Quarter of each Year, 1838-66.

Table with columns: YEARS., NUMBER OF DEATHS IN THE AVERAGE QUARTER., PROPORTIONAL NUMBER OF DEATHS (In the AVERAGE QUARTER, FIRST QUARTER, SECOND QUARTER, THIRD QUARTER, FOURTH QUARTER).







which is much higher than the English rate, 3.554, and conspicuously higher than the French, which is 2.612 per cent.

The birth-rates of Italy and Spain were respectively 3.862 and 3.703 per cent., both higher than the English rate, and show a superiority only too striking over that of France.

Austria which is low in its marriage-rate, and high in its birth-rate, showed a death-rate higher considerably than the rates of England and France; it was 3.232 per cent. against 2.326 the French death-rate in 1866, which latter was rather lower than the English. The death-rate of the Italian kingdom was 2.896; that of Spain 2.805, both contrasting unfavourably with those of England and France.

TABLE 28.—Italy. Population, Numbers, and Proportions per Cent. of Marriages, Births, and Deaths, exclusive of still-born, in each of the Years 1862 to 1866. (Supplied by DR. MAESTRI, Chief of the Statistical Department of Italy.)

Table with 10 columns: YEARS, ESTIMATED POPULATION on 31st Dec., MAR-RIAGES, PERSONS MARRIED, BIRTHS. Exclusive of Still-born., DEATHS., MAR-RIAGES., PERSONS MARRIED., BIRTHS., DEATHS.

NOTE.—The Returns of Births and Deaths in the year 1862 included the still-born, and as no separate return of them was made in that year the numbers returned as still-born in 1863 have been deducted from the Births and Deaths for the year 1862.

TABLE 29.—Spain. Population, Numbers and Proportions per Cent. of Births and Deaths in each of the Years 1861 to 1866.

(Supplied by SIGNOR DON JOSÉ EMILIO DE SANTOS, Director de Trabajos de Oficina y Secretario General, Madrid.)

Table with 6 columns: YEARS, ESTIMATED POPULATION., BIRTHS., DEATHS., BIRTHS., DEATHS.

NOTE.—The Population enumerated at the Census of 1860 was 15,673,536. The estimated Population for the Years 1861-6 has been deduced from the Excess of Births over Deaths in each Year.

THE BRITISH ARMY.

By returns with which I have been favoured by His Royal Highness the General Commanding-in-Chief, it is shown that the strength of the Army at home and abroad in 1866, was 201,641 officers and men.

TABLE 30.—Annual Rate of Mortality per Cent. in Great Britain, England, France, Austria, and in Italy, including the Deaths of Soldiers at Home and Abroad, 1857 to 1866.

Table with 6 columns: YEARS, GREAT BRITAIN., ENGLAND and WALES., FRANCE., AUSTRIA., ITALY.

TABLE 31.—Average Strength of the Army at Home, in the Year 1866. (Furnished to the Registrar General by direction of H.R.H. the General Commanding in Chief.)

Table with 9 columns: UNITED KINGDOM., ENGLAND, WALES, AND CHANNEL ISLANDS., SCOTLAND., IRELAND., Officers., Non-commissioned Officers and Men., Officers., Non-commissioned Officers and Men., Officers., Non-commissioned Officers and Men., Officers., Non-commissioned Officers and Men.

Officers and Men. British Army at Home in 1866 - 84,124 Abroad - 117,517 Total - 201,641

TABLE 32.—Average Strength, Deaths, and Annual Rate of Mortality per Cent. of the Army in the United Kingdom in 1866.

Table with 7 columns: AVERAGE STRENGTH., DEATHS., ANNUAL RATE OF MORTALITY PER CENT., Officers., Non-commissioned Officers and Men., Officers., Non-commissioned Officers and Men., Officers., Non-commissioned Officers and Men.

4470 officers, 79,654 men, of whom there were in England and the Channel Islands 3021 officers, 53,456 men. The remaining part of the home strength consisted of 27,647 officers and men in Scotland and

TABLE 33.—Return showing the Average Strength of the British Army Abroad in each of the Years 1863-1866. (Furnished to the Registrar General by the Adjutant-General by direction of H.R.H. the General Commanding in Chief.)

	1863		1864		1865		1866	
	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.
Cavalry - -	366	6,127	386	6,207	393	6,083	413	6,283
Infantry - -	4,383	97,597	4,572	98,865	4,409	92,672	4,192	85,882
Artillery - -	1,165	19,739	818	19,143	965	17,519	1,216	17,347
Engineers - -	329	2,010	391	1,825	388	1,775	431	1,753
Total - - -	6,243	125,473	6,167	126,040	6,155	118,049	6,252	111,265

TABLE 34.—Number of Deaths in the British Army during each of the Years 1863-1866. (Furnished to the Registrar General by the Adjutant-General by direction of H.R.H. the General Commanding in Chief.)

CORPS.	1863						1864						1865						1866					
	GREAT BRITAIN.		IRELAND.		ABROAD.		GREAT BRITAIN.		IRELAND.		ABROAD.		GREAT BRITAIN.		IRELAND.		ABROAD.		GREAT BRITAIN.		IRELAND.		ABROAD.	
	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.	Officers.	Non-commissioned Officers and Men.
Cavalry and Infantry -	17	556	4	199	83	1,688	17	613	3	192	92	1,920	21	529	2	191	75	1,990	17	576	13	218	67	1,381
Artillery -	4	147	1	9	14	402	9	157	-	11	12	416	12	162	1	18	17	468	13	181	2	20	9	316
Engineers -	6	11	-	1	2	20	1	13	-	1	3	50	1	22	-	-	5	23	4	11	-	1	3	26
Total -	27	714	5	209	99	2,110	27	783	3	204	107	2,386	34	713	3	209	97	2,481	34	768	15	239	79	1,723

TABLE 35.—Annual Rate of Mortality per Cent. amongst the OFFICERS and NON-COMMISSIONED OFFICERS and MEN in the Army Abroad, in each of the Years 1858-66. (Deduced from the Strength and Deaths as given in the two preceding Tables.)

YEARS.	OFFICERS.	NON-COMMISSIONED OFFICERS and MEN.
1858	3.513	6.701
1859	2.111	3.396
1860	1.639	2.603
1861	1.574	2.567
1862	1.346	1.981
1863	1.586	1.682
1864	1.735	1.893
1865	1.576	2.102
1866	1.264	1.549

Ireland, of whom the large proportion of 24,238 was stationed in the latter country. Within the term "men" are also classed non-commissioned officers.

The proportions of military force in the three Kingdoms, to civil population were: England and the Channel Islands 26; Scotland 11; Ireland 43 to 10,000.

In the United Kingdom 49 officers and 1007 men died in 1866. The mortality of officers was 1.096 per cent.; that of men 1.264. The mortality of officers was less in Great Britain than in Ireland; but amongst the men it was higher in Great Britain than in the sister island.

Abroad there were 6252 officers and 111,265 men. The number of soldiers was less by about 15,000 than the number abroad in 1864, and less by about 7000 than the number in 1865.

TABLE 36.—Army serving at Home and Abroad.

	1861
Officers and Men born in ENGLAND - - -	130,469
" " " SCOTLAND - - -	20,901
" " " IRELAND - - -	71,556
" " " FOREIGN PARTS - - -	6,635
TOTAL - - - - -	229,561

TABLE 37.—Deaths of Officers and Men in the Army Abroad, and Estimated Numbers belonging to Great Britain and to England and Wales, in each of the Years 1858-1866.

YEARS.	DEATHS of OFFICERS AND MEN in the ARMY ABROAD.	Estimated Numbers in Col. 2. belonging to	
		GREAT BRITAIN.	ENGLAND AND WALES.
1	2	3	4
1858	7,363	4,275	3,486
1859	4,150	2,409	1,965
1860	3,293	1,912	1,559
1861	3,097	2,042	1,700
1862	2,544	1,677	1,445
1863	2,209	1,457	1,255
1864	2,493	1,644	1,417
1865	2,578	1,700	1,465
1866	1,802	1,188	1,024

The number of Deaths in the cols. 3 and 4 were estimated on the assumption that the soldiers abroad belonged to the different parts of the British Empire in the proportions indicated in the Table 36.

TABLE 38.—Austria. Annual Rate of Mortality per Cent. in the Army in each of the Years 1857-66.

YEARS.	ESTIMATED STRENGTH.	DEATHS.	ANNUAL RATE of MORTALITY per Cent.
1857	379,374	8,646	2.279
1858	347,696	8,577	2.467
1859	527,772	16,638	3.162
1860	384,302	11,903	3.097
1861	459,300	8,763	1.908
1862	400,895	6,800	1.696
1863	467,154	5,811	1.244
1864	559,599	6,928	1.238
1865	552,148	5,261	.953
1866	646,636	11,042	1.846

Seventy-nine officers and 1723 men died abroad in 1866. The mortality was remarkably low; that of officers was 1.264 per cent. against 1.576 in the previous year; of men 1.549 against 2.102 in 1865. This satisfactory improvement in the health of the army abroad is apparent, also, when the comparison is made with earlier years; and it furnishes interesting matter of inquiry in regard to the circumstances from which it sprung. The mortality of the Austrian army was 1.846 per cent. in 1866, the year when disaster befell the arms of that powerful empire.

BIRTHS AND DEATHS OF BRITISH SUBJECTS AT SEA.

The number of seamen at sea in merchant ships in 1866 was 196,371; and of that number 4866 died in the same year. These figures represent a mortality of 2.58 per cent., which is higher than that of any previous year within the limits of the returns.

The mercantile marine strength had an evident increase in 1863; there was a further great increase in the following year; and in 1866 the accession, that had been acquired, was fully maintained.

TABLE 39.—Number of Births and Deaths of British\* Subjects at Sea, exclusive of Soldiers, Marines, invalided Seamen from the Royal Navy, and Seamen on Ships' Articles, in the Years 1856-1866, reported by the Captains or Commanding Officers of Vessels to the Registrar General of Seamen at the Termination of their respective Voyages in Ports of the United Kingdom.—(Furnished to the Registrar General by the Registrar General of Seamen.)

		MALES.	FEMALES.	TOTAL.
BIRTHS at Sea	1856 (imperfect)	71	66	137
	1857	168	142	310
	1858	132	117	249
	1859	135	132	267
	1860	136	114	250
	1861	110	108	218
	1862	146	148	294
	1863	159	185	344
	1864	203	177	380
	1865	210	202	412
	1866	213	202	415
Total		1,683	1,593	3,276
†DEATHS at Sea	1856 (imperfect)	121	78	199
	1857	238	140	378
	1858	253	182	435
	1859	524	303	827
	1860	241	156	397
	1861	213	121	334
	1862	221	148	369
	1863	347	231	578
	1864	379	210	589
	1865	483	315	798
	1866	690	363	1,053
Total		3,710	2,247	5,957

\* British subjects are not particularly described in these returns, but foreign names have been excluded. A column headed *Place of Birth* was formerly contained in these returns, for the purpose of distinguishing passengers as British subjects or Foreigners, but in many cases it was not filled up by masters, in consequence of their inability to obtain the information after the death had taken place. British and Foreign seamen are distinguished.

† The deaths of soldiers, marines, and seamen from the Royal Navy, who were passengers in British Merchant Ships, were 33 in 1856, 59 in 1857, 156 in 1858, 196 in 1859, 196 in 1860, 69 in 1861, 122 in 1862, 116 in 1863, 96 in 1864, 140 in 1865, and 184 in 1866. The number is 1367 in eleven years, which, if added to the 5,957 above, makes 7,324, the total number of deaths of British subjects at sea in 1856-65, exclusive of those of merchant seamen.

The number of births at sea was 415 of which 213 were of boys, 202 of girls. The deaths at sea of British subjects, exclusive of soldiers and sailors, were 1053, of which 690 were those of males, 363 those of females.

ABSTRACT of a RETURN, which was ordered by the HOUSE OF COMMONS, 2d April 1867, of the Number, Ages, Ratings, and Causes of Death of SEAMEN, reported to the REGISTRAR GENERAL of Seamen as having died in the BRITISH MERCHANT SERVICE in the year 1866.

CAUSES.		Deaths.	Deaths.	Deaths.	
Smallpox	-	17	Apoplexy	-	57
Typhus	-	352	Heart disease	-	70
Dysentery	-	255	Bronchitis	-	10
Diarrhoea	-	43	Pneumonia	-	15
Cholera	-	433	Asthma	-	9
Ague	-	5	Lung disease	-	10
Yellow fever	-	146	Enteritis	-	12
Rheumatism	-	10	Liver disease	-	21
Syphilis	-	18	Debility	-	54
Scurvy	-	25	Exposure	-	6
Delirium Tremens	-	9	Frost	-	5
Intemperance	-	7	Cold	-	7
Dropsy	-	21	Vaguely returned as "cold"	-	7
Phthisis	-	163			
			Fracture and Concussion of brain	-	8
			Fall into hold	-	17
			Fall from aloft	-	131
			Tetanus	-	7
			Drowning by accident	-	1219
			Drowning by wreck	-	1171
			Sunstroke	-	15
			Murder	-	8
			Suicide	-	7
			Other specified causes	-	94
			Sudden	-	5
			Causes not specified	-	399
RATING.					
Mates	-	249	Surgeons	-	12
Midshipmen	-	4	Stewards	-	92
Quartermasters	-	3	Cooks	-	108
Boatswains	-	103	Carpenters	-	134
Able seamen	-	1652	Sailmakers	-	30
Ordinary seamen	-	427	Minor capacities	-	118
Apprentices and boys	-	311	Engineers	-	31
			Firemen	-	88
			Lascars	-	2
			Stowaways	-	9
			Unknown	-	1493
			TOTAL	-	4866
AGES.					
Under 20 years	-	741	Over 60 years	-	11
20-30 years	-	1955	Unknown	-	1205
31-40 years	-	640			
41-50 years	-	255	TOTAL	-	4866
51-60 years	-	59			

TABLE 40.—Mortality of Merchant Seamen at Sea, in the 15 Years 1852-66.\*

YEARS.	STRENGTH.	DEATHS.	ANNUAL RATE OF MORTALITY. To 100 living.
1852	159,563	2,205	1.38
1853	172,525	3,276	1.90
1854	162,416	2,772	1.71
1855	168,537	3,318	1.97
1856	173,918	3,549	2.04
1857	176,387	3,444	1.95
1858	177,832	3,486	1.96
1859	172,506	3,430	1.99
1860	171,592	3,760	2.19
1861	171,937	3,580	2.08
1862	173,863	3,620	2.08
1863	184,727	3,380	1.83
1864	195,756	3,893	1.99
1865	197,443	4,600	2.33
1866	196,371	4,866	2.58
In the 15 years 1852-66	2,655,593	53,179	2.00

\* Deduced from a return of the number of accounts of wages and effects of seamen (exclusive of masters) dying before the termination of the voyage, received by the Registrar General of Seamen. This return does not include seamen dying ashore in foreign parts, whose wages and effects are delivered to the consuls or officers of the hospitals to which such men are sent; accounts of their effects are sent direct to the Board of Trade.

† If a seaman dies on the passage from Sunderland to Calcutta, his death is reported at Calcutta, and his wages and effects are accounted for and transmitted home, if the vessel is not to return direct to the United Kingdom. But if a passenger dies on board a ship which does not return to a British port immediately, but trades for a time in foreign parts, considerable delay may occur before his death is reported. In all cases, however, the date is given, and in the accompanying tables the births and deaths are classed according to the years in which they occurred. In some passenger-ships women are employed as stewardesses, and are counted as part of the crew. They therefore form part of the strength in this Table, and if the death of a stewardess occurs in the course of a voyage, it is included in the column of Deaths.

When a ship is lost with all persons on board, the owners return the number and names of the crew, and the names of the passengers, when known, to the Registrar-General of Seamen.

## MARINE REGISTER BOOK.

It is required by the Registration Act that captains or commanding officers of British vessels should transmit to me the particulars of all births and deaths of English subjects that occur at sea. In 1866 only 74 births and 184 deaths were reported for entry in the Marine Register Book, which is kept at this office.

## NAMES ON THE REGISTERS, AND SEARCHES.

At the end of 1866 the number of names inscribed in the registers kept under the Registration Act, 6 & 7 Will. 4. c. 86. had reached 38,833,752, the addition for the year having been 1,630,111 names. An alphabetical Index referring to the names entered in the registers is prepared for each of the four quarters of the year as soon as practicable after the certified copies are received at this central office and subjected to a strict examination, with a view of detecting errors and informalities admitting of correction or explanation. By means of the general Indexes the entry of any birth, death, or marriage which has been registered since 1st July 1837, can generally, on a mere mention of the name, without a precise statement of the date or locality, be very soon discovered, and a certificate given.

The rapidly increasing bulk of the Indexes, to which more than 1,600,000 names are annually added, the limited space in the present Public Search Room of this office, and other considerations connected with the convenience of the public in making searches, have led to the adoption of an important change in the manner in which part of this great national work is carried out. It appeared to me highly desirable that the Indexes, instead of being prepared and exhibited to the public in manuscript, should be printed. Printing is more accurate than copying by hand; printed Indexes too occupy much less space; while additional copies can be

TABLE 41.—Aggregate Number of Names on the Registers at the End of each Year 1837–66; also the Number of Searches for Registers at the Central Office (exclusive of Searches in Non-parochial Registers).

YEARS.	AGGREGATE NUMBER				NUMBER OF SEARCHES FOR REGISTERS at the CENTRAL OFFICE.
	OF PERSONS MARRIED.	OF BIRTHS.	OF DEATHS.	OF NAMES REGISTERED.	
1837	116,958	164,116	148,701	429,775	Not known.
1838	353,092	627,903	491,461	1,472,456	
1839	599,424	1,120,477	830,445	2,550,346	
1840	844,754	1,622,780	1,190,132	3,657,666	620 705
1841	1,089,743	2,134,338	1,533,979	4,758,663	
1842	1,327,336	2,652,677	1,833,498	5,863,571	
1843	1,575,032	3,180,002	2,229,943	6,984,977	
1844	1,839,530	3,720,765	2,586,876	8,147,171	
1845	2,127,016	4,264,286	2,936,242	9,327,544	
1846	2,418,344	4,836,911	3,326,557	10,581,812	881
1847	2,690,034	5,376,876	3,749,861	11,816,771	941
1848	2,966,494	5,939,935	4,149,694	13,056,123	1,030
1849	3,250,230	6,518,094	4,590,533	14,358,887	1,162
1850	3,555,748	7,111,516	4,959,528	15,626,792	1,228
1851	3,864,160	7,727,381	5,354,924	16,946,465	1,442
1852	4,181,724	8,351,333	5,762,059	18,295,176	1,658
1853	4,510,764	8,963,784	6,183,156	19,657,704	1,676
1854	4,830,218	9,598,189	6,621,061	21,049,468	2,340
1855	5,134,444	10,233,232	7,046,764	22,414,440	2,492
1856	5,453,113	10,890,685	7,437,270	23,781,073	2,353
1857	5,771,312	11,553,756	7,837,085	25,182,153	2,965
1858	6,083,452	12,209,237	8,306,741	26,599,430	4,063
1859	6,418,838	12,899,118	8,747,522	28,065,538	5,052
1860	6,759,210	13,583,166	9,170,243	29,512,619	5,636
1861	7,086,622	14,279,572	9,605,357	30,971,551	6,133
1862	7,414,682	14,992,256	10,041,923	32,448,861	7,297
1863	7,761,702	15,719,673	10,515,760	33,997,135	7,715
1864	8,122,476	16,459,948	11,011,291	35,593,715	8,346
1865	8,493,424	17,208,017	11,502,200	37,203,641	9,016
1866	8,868,976	17,961,887	12,002,889	38,833,752	10,970

NOTE.—The numbers registered in 1837 are for the Half Year ending December 31st.

obtained at a trifling cost; moreover, printed columns of names can be referred to with greater ease than manuscript. With the assistance of the Comptroller of Her Majesty's Stationery Office, I have been enabled to carry out the arrangements for effecting this change; and the quarterly Indexes from the commencement of 1866 have been printed, with the utmost regard to accuracy and punctuality, by Messrs. Eyre and Spottiswoode, six copies being now produced at little more than the former cost of one. I may add, that the persons who make use of the volumes for searches, constantly express their satisfaction with the new printed Indexes.

The number of searches for registers at the CENTRAL OFFICE continued to increase during 1866. In the indexes prepared under the Registration Act 10,970 searches were made, and 9145 certificates were given; the searches for non-parochial registers were 1153, and the certificates granted 862. The total amount received in fees for searches and certificates, and paid into the Exchequer was 1,860*l.* 15*s.* 6*d.* The numerous searches for registers of births for purposes connected with the Factory Acts being made without charge are not included in the above.

The following are the registers and records deposited in my custody at this office, now exhibited to the public on payment of the statutory fees, viz., 1*s.* for search, and 2*s.* 6*d.* for certificate or certified extract:—

1. REGISTERS OF BIRTHS AND DEATHS registered in England and Wales on and after 1st July 1837.
2. REGISTERS OF MARRIAGES registered in England and Wales on and after 1st July 1837, after solemnization in Churches of the Established Church, in registered Roman Catholic and Dissenting Places of Worship, and in District Register Offices; also of Quakers and of Jews.
3. REGISTERS OF BIRTHS AND DEATHS AT SEA registered since 1st July 1837.
4. NON-PAROCIAL REGISTERS OF BAPTISMS or Births, BURIALS or Deaths, and (in a few instances) of MARRIAGES, being the Registers or Records kept by various bodies and congregations of Nonconformists prior to the general system of registration commenced in 1837;—comprising amongst others the Registers kept at *Dr. Williams' Library* from 1742; *Bunhill Fields Burial Ground* from 1713; the registers of *French Protestant and other Foreign Churches* in England; the registers of the *Society of Friends*, &c.
5. REGISTERS OF MARRIAGES of British Subjects in FOREIGN COUNTRIES, pursuant to the Act 12 & 13 Vict. c. 68. [The Marriages under this Act are those solemnized since July 1849, at British Consulates abroad.]
6. REGISTERS OF MARRIAGES IN INDIA, pursuant to 14 & 15 Vict. c. 40. [The Marriages under this Act are those solemnized since 1st January 1852, in the presence of Registrars in India; the Marriages by Clergymen of the Church of England are not included.]
7. REGISTER OF BUILDINGS CERTIFIED to the Registrar General AS PLACES OF RELIGIOUS WORSHIP (18 & 19 Vict. c. 81.)
8. RETURNS OF PLACES OF WORSHIP certified to Diocesan Registrars, Clerks of the Peace, &c. prior to 1st July 1852 (19 & 20 Vict. c. 119. s. 24.)
9. FLEET and MAY FAIR REGISTERS OF MARRIAGES.
10. REGISTERS OF BIRTHS AND DEATHS of British Subjects received from Her Majesty's Consuls and from other authorities in Foreign Countries.

For Certificates required for purposes connected with Government Insurances and Annuities, or for production to the Civil Service Commissioners, personal application is dispensed with.

The Report on the Causes of Death in England, addressed to me by Dr. Farr, will be found in the Appendix.

I have the honour to be,  
Sir,  
Your faithful servant,  
GEORGE GRAHAM,  
*Registrar-General.*

## Summary of the Quarterly Reports, 1866.

## First Quarter.—January, February, March.

*The United Kingdom.*—The Registers of the United Kingdom show that 110,440 persons married in the quarter that ended 31st March; and that the births of 265,717 children, and the deaths of 185,035 persons of both sexes, were registered in the same three months.

The death-rate of the United Kingdom differs little from that prevailing in England and Wales to be here discussed. The several facts concerning the other divisions of the Kingdom are fully set forth in the reports of the Registrar General of Scotland and the Registrar General of Ireland.

The estimated population in 1866 of England, Scotland, and Ireland is about 29,946,058. The corrected death-rate of the quarter is 2·600 per cent.

*England.*—The marriage-rate, which was low in 1861–62, but revived subsequently, and was remarkably high in 1865, continued to be well maintained in the first quarter of the present year. The natural growth of the population, as shown by the birth-registers, has been active for a considerable time; and it was well maintained in the first three months of the present year. Against this latter fact must be set the high mortality which prevailed during the same period, partly in consequence of meteorological conditions and changes, unfavourable to health.

*Marriages.*—In the March quarter 75,158 persons were married in England. The marriages were 37,579 against 33,427 in the same quarter of 1866. The number of marriages advances with the increase of population, but not without fluctuations that are attendant on the changing condition of the people, of which condition industrial success or adversity is perhaps the most appreciable, but not the only, element. At the beginning of the last decade the annual number of marriages was about 160,000; at the end of it the number returned in a year was more than 185,000.

The annual marriage-rate in the first quarter of the present year was 1·442 (viz. of persons married) to a hundred persons living. The average rate of ten March quarters was 1·40.

*Births.*—Of children born in the March quarter of the present year the number was 196,753, against the high number 194,130 in the corresponding period of 1865. The annual birth-rate for the same period was 3·776 per cent.; the average being 3·644. The birth-rate is always higher in the first six months of the year than in the last; but the tables for the last ten years furnish no instance of a rate so high as that which prevailed last quarter. London yielded its fair contribution to the increase; the births were under 30,000 in the metropolis, and about that number in Cheshire and Lancashire. In some counties, as Oxfordshire, Buckinghamshire, and Norfolk, there was a decrease, for which others, chiefly in the northern parts of the Kingdom and in Wales, more than compensated by their increase. The births were very numerous in Surrey, Devonshire, Lancashire, Durham, Northumberland, Cumberland, and Wales.

*Increase of Population.*—Whilst the births were 196,753, the deaths were in the same time 138,136, and the excess of the former over the latter was 58,617. The natural increase was 651 daily; but this was disturbed by migratory tendencies, always in active operation.

The total number of emigrants from ports in England, Scotland, and Ireland was 39,672, of whom about 11,000 were of English origin. Irish

emigration from the same ports was nearly double that amount. Of the total number 33,000 emigrants had chosen the United States for their destination, 6000 the Australian Colonies. Of the 21,000 Irish emigrants, 19,000 went to the United States.

Emigration declined greatly in the first quarter of 1865; but it has again increased, and was as active as in the two previous years 1863–64.

*Prices, Pauperism, and the Weather.*—The price of wheat continues to rise, and in the first three months of this year it was 45s. 6d. per quarter, which is five shillings more than it was in the same period of 1864, and seven shillings more than in that of 1865. During the four quarterly periods that have elapsed since the 31st March 1865, it has been slowly but constantly rising; it was 40s. 6d., 43s. 3d., 44s. 10d., and 45s. 6d. Beef at Leadenhall and Newgate Markets, sold by the carcase, averaged 58d. per lb., a price which differed but little from those of the March quarter in 1864 and 1865, which were 5½d. and 5¾d. The price for inferior quality of beef was in all these three periods the same, viz. 4½d.; for superior it was 6½d. in 1864, 7d. in 1865, 6¾d. last quarter. The highest price of beef scarcely varied during the last eighteen months. The mean price of mutton was 68d., and was rather higher than in the two previous corresponding quarters. Best potatoes at the Waterside Market, Southwark, ranged from 55s. to 90s. per ton.

The average number of paupers relieved on the last day of each week in the quarter was 139,541 in-door, 759,400 out-door. The amount of in-door relief was the same as in the March quarter of 1864, but rather less than that of 1865. The number of out-door paupers was less than it had been in either of those periods.

According to the Greenwich Observations the month of January was warmer than that month has been in any year since 1851. In ordinary course, January is almost 3° colder than December; but last January was as warm as the remarkably warm month that closed the year 1865. At the beginning of the month the weather was stormy, and the wind blew in gales; and on the 11th there was in London a fall of unusually heavy snow, which seriously impeded traffic and broke down the telegraphic poles and wires. Soon the snow disappeared under a rapid thaw, which was followed by the inundation of all the low-lying lands in the valley of the Thames. Heavy rains and high winds, with frequent changes, attended the month to its close; but its most striking feature was the high temperature, which continued till near the middle of February, and showed an average excess of 6° daily. From this date till the middle of March the air was almost continuously cold, and the average daily defect of temperature was about 3°. Four days of heat followed; then four days of cold; and finally a warm period of eight days, in which the mean temperature rose 6° above the average. The extreme mildness of the first six weeks quickened vegetation; hedges and fruit-trees budded, and in some places almost burst into blossom. The change in the atmosphere from mild and damp to cold and dry was favourable to agricultural operations, which had been in a backward state owing to the soddened state of the ground; and was besides a salutary check on the too rapid advance of vegetation; and at the end of the quarter the growing crops were sufficiently forward not to be injured by sudden frosts. The mean temperature of the air in the quarter was 41·2°, which is 1·7° above the average of the same period in the previous twenty-five years. The fall of rain was 9·3 in., which amount is 4·5 in. above the average. Less than two inches of that quantity fell in March; the rest in nearly equal portions in the two previous months. The atmospheric pressure was low throughout the quarter. The reporter at Guernsey states that in January the island was visited by a succession of storms, evidently recurrent cyclones; the most violent of which occurred on the 11th, raged with extraordinary fury, and inflicted extensive injury on trees and houses. The barometer fell to 28·444 in.,

the greatest depression known there for 23 years. At Aldershot on the 11th, snow covered the ground to a depth of 9 in. ; and about the middle of the month snowdrops, crocuses, and primroses were in flower. On the 4th February a hurricane of unprecedented violence blew at Belfast and for many miles around it, accompanied with thunder and lightning, and with hail and rain which swept along in masses. "Large trees were torn up; chimneys thrown down, and slates whirled through the air like feathers." This storm visited Manchester and some other places in the north of England.

*Deaths; and the State of the Public Health.*—The weather in the quarter, as it was observed in the metropolis, has been described in its main points; and the description of it is for the most part applicable to that which was experienced over the country. It was unfavourable to health; and by exciting or aggravating pulmonary diseases carried off many persons of advanced age. The total number of deaths in England and Wales was 138,136, which implies a rate of mortality above the average of ten previous winters, though not so high as it had been in the winters of 1864 and 1865. In these two periods 142,977 and 140,646 deaths were registered.

It deserves to be noticed, that while the mortality in London and eight other divisions was lower last quarter than in the corresponding period of 1865, it was higher in the two remaining divisions, viz., the North-western Counties (Cheshire and Lancashire) and Yorkshire. It would appear that in the large and always unhealthy manufacturing towns in these parts, the people suffered more than they did in others from conditions and sudden changes of the atmosphere which were not confined to them; and also, as shown in the Registrars' reports, that scarlatina, measles, whooping-cough, and other zymotic diseases prevailed there, and co-operated with the weather in producing a high mortality.

The population of London is not very different in amount from that of Cheshire and Lancashire; the births were as 28 in the former to 30 in the latter; but the deaths were as 20 to 26.

The annual rate of mortality last quarter in England was 2.652 per cent.; the average of ten previous winters being 2.50. But it is a remarkable circumstance that this excess above the average was contributed entirely by the large towns; for in the country districts the death-rate, 2.252, was actually lower than the average, 2.295. The annual rate of mortality in the 142 town districts was 2.967 against the average, 2.68. These results confirm the conclusion that there were other destructive causes at work besides unfavourable states of the weather—that the diseases above mentioned, which commit so much havoc in towns, were still more extensively fatal, and only acquired additional vigour from influences peculiar to the season.

The death-rate was higher in Cheshire and Lancashire than in any other of the eleven divisions; it was 3.384 per cent. In Yorkshire it was 2.960; in London 2.666; in the West Midland Counties 2.654; in the Northern Counties (Durham, Northumberland, &c.) 2.443. It was lowest in the South-eastern Counties, where it was 2.185.

If the map of England were shaded to represent the rates of mortality of last quarter in the registration districts, the eye, travelling from the lighter south to the darker north would be instantly drawn to a spot of portentous darkness on the Mersey; and the question would be asked whether cholera, the black death, or other plague, imported with bales of merchandise, had been lately introduced into its busy and populous seaport. Happily this has not been the case; but fever, probably developed or aided by the mild and damp atmosphere of the season, and by overcrowding in an increasing population, has been busy and fatal in Liverpool, and in other towns of the same county, and of Yorkshire. The annual mortality of the borough of Liverpool in the three months was

excessive, and demands immediate and earnest consideration; it rose to 4.593 per cent. This implies that if this death-rate were maintained for a year, forty-six persons out of a thousand in the population would die in that time, or fifteen more than died in Glasgow, its northern rival, nineteen more than in London. The mortality of the city of Manchester, though far less than that of Liverpool, was higher than in any other of the thirteen selected towns of the United Kingdom; it was 3.742 per cent., and that of Leeds was hardly less. The following numbers of deaths registered in a few DISTRICTS in three corresponding quarters, make the recent increase sufficiently apparent:—

	March quarter 1864.	March quarter 1865.	March quarter 1866.
Liverpool	3013	3053	3521
West Derby	2136	2047	2626
Chorlton	1393	1196	1504
Manchester	2255	2313	2498
Ashton	779	836	1006
Oldham	673	853	1108
Blackburn	802	941	1148
Leeds	1088	961	1234

The Registrar of the Howard-street sub-district of Liverpool reports 33 deaths from typhus out of 330 from all causes; and many occurred from bronchitis and whooping-cough. In the St. Thomas sub-district of the same town 28 were from typhus out of 311; and pulmonary diseases were fatal. In the Mount Pleasant sub-district, in which the workhouse is situated, out of a total number of 1046 deaths, 215 were caused by typhus; 112 by bronchitis, 143 by phthisis, 26 by whooping-cough, 23 by measles, 19 by scarlatina. The Registrar of the Islington sub-district of Liverpool believes that overcrowding is amongst the causes of a high mortality. At Warrington there were 287 deaths, and no less than 94 of these were from measles. Typhus has been for some time very fatal in Manchester: it is stated by the Registrar of Deansgate that in the quarter ending 31st December 1865, not less than 1530 persons were attacked by continued fever in Manchester and its suburbs, and of these 155 died; and the disease has continued to prevail during the last quarter. In the sub-district of North Leeds, in a total mortality of 570 deaths, 79 were returned as caused by fever. It prevailed also fatally in Newcastle-on-Tyne.

Some further observations by Mr. Leigh, the Registrar of Deansgate, Manchester, on the smoke of that city, and its effects on health, will be read with interest.

ON THE CAUSES OF THE VITIATION OF THE ATMOSPHERE OF MANCHESER, by JOHN LEIGH, Esq., M.R.C.S., Registrar of the Sub-district of Deansgate, Manchester. (Continued from *Twenty-eighth Annual Report*, page lvi.)

In some comments on the last Quarterly Return of Deaths in this district I endeavoured to show that the deterioration of health and the excessive mortality in Manchester were mainly due to the vitiation of its atmosphere. I showed that Manchester was amply supplied with good and pure water; that its artisans were in receipt of higher wages than agricultural labourers, and were better clothed and fed; that its streets were admirably paved, sewered, drained, and swept, so in this respect it may challenge comparison with any town in the kingdom. Other improvements on an extensive scale have been carried out, and its thoroughfares are now tolerably wide and spacious. Its hospitals, some of which are magnificent in structure and arrangements, as well as munificently supported, are dotted over the town; and the amount of its charities must be deemed honourable to its citizens. When to all this it is added, that the working men associate themselves in various benefit societies, under the names of Odd Fellows, Druids, Foresters, Gardeners, besides Packers and other trade societies, and that not less than 20,000 to 30,000 of the adult males of the town are so associated, and receive assistance, pecuniary and medical, during sickness or when out of work, Manchester must be regarded in many respects as a model town; and yet it is one of the least healthy in the kingdom.

Children under five years of age contribute half of the total mortality, whilst in the agricultural districts one third of the deaths is their proportion. The artisan's wife dies in middle age; and his own career is cut short long before he has reached the seventy years' term allotted to man. In the Reports of the Registrar General through a succession of years, these facts have been fully established. Whilst the annual death-rate of England is 22 for a thousand of the population on an average of ten years, and that of favourably situated localities is very much less, falling in some to 15, it has been on an average of the same period for Manchester not less than 31, and for the year 1865 it amounted to 35.6.

The impurities of a town atmosphere may be distinguished into solid, vaporous perhaps vesicular, and gaseous; and the distinction is necessary, for whilst the solid impurities tend by their gravity to occupy the lower stratum of the atmosphere, and the vaporous or vesicular are subject only to the wafting of aerial currents, the gaseous tend by their own repulsive powers to general atmospheric diffusion. Their action on the human system is distinct. The solid impurities act as irritants to the respiratory organs; the vaporous or vesicular are the direct excitants of many types of disease; whilst the purely gaseous so depress and enervate the system as to render it an easier prey of disease.

Of solid impurities the principal one is coal smoke, which forms a continual dark and dense canopy over the town, and causes a murkiness in the streets from which they are never free. On the finest day the air is darkened by haze, through whose wide extent the prospect seems as it were bounded by an impenetrable wall. From a distance of four or five miles in the country, particularly on the approach of evening, the slanting rays of the sun give remarkable definition to the cloudy pall, and indicate very distinctly the site and limits of Manchester.

A rough analysis divides coal smoke into three parts. If the smoke is passed through a column of water in a suitable apparatus, a quantity of black fuliginous matter is separated from it, and some salts of ammonia are dissolved out of it by the water. If it be passed through a similar apparatus containing alcohol, a portion of bituminous matter is dissolved out, though this is still better accomplished by the substitution of highly rectified coal naphtha. There remains a quantity of purely gaseous matters, the composition of which is well known. The black matter separated by the water is found constantly floating in a smoky atmosphere in distinct particles, sometimes of considerable size, known popularly as "blacks." They settle in time on the streets and footpaths, find their way into the houses, cover all articles of furniture, soil and damage drapery, curtains, carpets, table covers, similarly affect wearing apparel and other surfaces, till it is generally recognized that light coloured clothes cannot be worn in Manchester, nor the hands remain clean if ungloved.

But these black particles always in the atmosphere are of necessity constantly inhaled by the inhabitants, constantly received into the lungs, whether those lungs are healthy or not. The best analysis of them with which I am acquainted is that of Braconnot (*Annal de Chim. et de Phys.* tom. 33), who found as the constituents:—

Carbon	-	-	-	79.1
Water	-	-	-	8.0
Resin	-	-	-	5.3
Bitumen	-	-	-	1.7
Sulphate of ammonia	-	-	-	3.3
Sulphate of lime	-	-	-	.8
Quartz sand	-	-	-	.6
Ulmin	-	-	-	.5
Sulphate of potash	-	-	-	.4
				<hr/>
				99.7

That a considerable portion of this soot is arrested in the upper air-passages there can be no doubt; but that a quantity also finds its way into the lungs, that is into the smaller ramifications of the bronchial tubes, and perhaps into the air cells, is proved by the black expectoration common among the residents of smoky towns, and by the carbonaceous matter found not only in the bronchial glands but occasionally also in the substance of the lungs when previous lesion has existed. It is possible indeed that in many cases the foreign body introduced into the lungs has caused the lesion. "It is necessary to be aware," says Dr. C. J. B. Williams (on Diseases of the Chest), "of confounding with melanosis the accumulations of black pulmonary matter which take place to a great extent in the lungs of old people, especially amongst the inhabitants of large towns. These are probably, as Dr. Pearson observes, derived from the soot inhaled with the air, which may find access to the texture of the lungs from such lesions of the bronchial membrane as often result from a common cold or cough. Some curious cases are on record in which carbonaceous accumulations have taken place so rapidly and extensively as to cause chronic inflammation and consolidation of a perfectly black colour, which tends to ulceration and the formation of cavities, as in other cases of chronic consolidation." Drs. Gregory, Thompson, and others describe such cases as occurring in persons labouring under bronchial disease, whilst continually employed by the light of smoky lamps.

There can be no doubt that the constant inhalation of particles constituted as Braconnot has shown these to be, compounds mainly of carbon, bitumen, and sulphate of ammonia, must be highly irritating to the lungs, and productive in many instances of an amount of inflammation sufficient to induce incipient phthisis or bronchitis, or to determine the recurrence of these where a predisposition exists.

It is no answer to say that many people living in large smoky towns continue healthy, and attain to a considerable age. There are strong healthy people, with great powers of resistance, who form exceptions in all circumstances; but the general condition of old people, and of those approaching old age, in the working classes of Manchester, is bronchitic in a greater or less degree; and at all ages men, women, and children of delicate organization or scrofulous diathesis, or whose state of health has been reduced by other causes, are very much disposed to take on phthisical or bronchitic disease, under the irritating effects of a Manchester atmosphere. "Among the local causes of consumption," again to quote Dr. Williams, "is to be reckoned the habitual inhalation of fine solid particles which is contingent on certain occupations. The dependence of the lesions in these cases on the mechanical irritation of the inhaled particles is sufficiently proved by the presence of these particles in the indurated lung, which in the case of colliers is completely blackened with them." From a long and somewhat extensive experience I can fully confirm these observations. In estimating the effects of coal smoke in the production or excitement of phthisis, it is a question whether this disease should be regarded as the result of a low type or degree of inflammation. The essential condition of incipient phthisis is the formation of tubercle, miliary or diffused. Andral supposes the miliary and diffused indurations to be the result of chronic inflammation affecting the vesicles of the lungs or the general texture; and in this he is supported by Chomel and Louis. Dr. Williams, after showing that tubercular induration contains a greatly increased quantity of matter, and that it is not the result of diminished absorption, asserts it to be the result of increased secretion, implying an increased determination of blood to the part, and he inquires if this may not amount to inflammation. In acute pleurisy we have a secretion of coagulable lymph, soon becoming organised into a soft cellular membrane; but in a more chronic form of inflammation, a texture of lower vitality is produced, a kind of fibrous or cartilaginous structure. In acute pneumonia we have an effusion of lymph causing red granular hepatization; but in lower prolonged inflammation of pulmonary tissue we have a dark consolidation differing little from phthisical induration; whilst in long continued irritation, unattended by the more sthenic degree of vascular action, the texture is grey, dense, and semi-transparent, indeed exactly like miliary tubercle.

It may be shown that the mean annual mortality from diseases of the respiratory organs is greater in Lancashire and Cheshire than in other divisions of England, with the exception of London.

## DEATHS of MALES to a hundred Males living (1851-60).

	From DISEASES of Lungs (exclusive of Phthisis).	From Phthisis.
Lancashire and Cheshire	0.417	0.299
Metropolis	0.448	0.329
Yorkshire	0.321	0.247
Durham, Northumberland, Cumberland, and Westmorland	0.263	0.221
Leicestershire, Rutlandshire, Lincolnshire, Nottinghamshire, and Derbyshire	0.264	0.214
Gloucestershire, Herefordshire, Shropshire, Staffordshire, Worcestershire, and Warwickshire	0.373	0.223
Middlesex (part of), Hertfordshire, Bucks, Oxfordshire, Northamptonshire, Huntingdonshire, Bedfordshire, and Cambridgeshire	0.273	0.220
Monmouthshire and Wales	0.253	0.298
Essex, Suffolk, and Norfolk	0.269	0.236
Surrey (part of), Kent (part of), Sussex, Hampshire, and Berkshire	0.269	0.247
Wiltshire, Dorsetshire, Devonshire, Cornwall, and Somersetshire	0.297	0.232

The above Table shows a higher mortality in London from this class of diseases than in other divisions; but even in London the mortality of females from phthisis is considerably less than it is in Lancashire and Cheshire, the rates being 0.249 and 0.334 respectively. But the contrast is more striking if the district of Manchester is compared with another, say Scarborough, where the total mortality is near that of England.



Scarborough.—Deaths of males from diseases of lungs (ex. phth.), 0·287 per cent.; from phthisis, 0·145 per cent.  
 Manchester.—Deaths of males from diseases of lungs (ex. phth.), 0·578 per cent.; from phthisis, 0·384 per cent.

Also the results for Manchester are less favourable than those for London.

Besides the palpable and offensive black particles of which the clouds that issue from our factory chimneys are composed, there is a more finely precipitated matter which in the country curls among the trees from the roof of a cottage, and in Manchester forms the constant haze of our streets. I do not think any scientific investigation has yet been made of it. It is not gaseous, for it does not diffuse; it is not simply vaporous. When it saturates or charges a November fog it is sticky, and excessively irritating to the eyes and throat. It proceeds from the imperfect combustion of bituminous matter, and partially from the distillation of the least volatile products of coal. Since it is so irritating to the eyes and lungs when made more dense by a fog, it must in a less degree be a constant source of irritation under the ordinary conditions of a smoky atmosphere. From experiments I have made on it, I am satisfied that it is in some degree bituminous.

From the way in which coal is ordinarily burned in the furnaces of manufactories, there are given off, in addition to the visible smoke, a number of invisible true gases, some of them resulting from the imperfect combustion of the coal; these are carbonic oxide, light carburetted hydrogen, sulphuretted hydrogen, and possibly a little cyanogen, and heavier carburets of hydrogen. The gases necessarily evolved are carbonic acid and sulphurous acid, with aqueous vapour. The natural tendency of all these gases is to diffuse themselves into the general body of the atmosphere; but the diffusion is, as regards some of them, to a considerable degree impeded by their extreme solubility, and by the quantity of moisture generally present in the atmosphere of Manchester. The carbonic oxide and light carburetted hydrogen have so little solubility that their diffusion would scarcely be diminished, and probably they may, with any small quantity of cyanogen or heavy hydrocarbons, be put out of consideration. Sulphuretted hydrogen, however, is at the least soluble in its own volume of water at ordinary temperatures. According to Thomson, one volume of water absorbs three volumes of the gas at 52° Fahrenheit, whilst of sulphurous acid gas thirty-three volumes are absorbed by one volume of water at ordinary temperature, according to the same authority. Carbonic acid is absorbed at the ordinary temperature by about its own volume of water. It is certain then that the presence of much moisture in the atmosphere, and even the vapour carried up the chimneys from the combustion of the coal, must materially interfere with the diffusion of these gases, and that a smoky town atmosphere must contain an abnormal amount of carbonic acid, and a distinct amount of sulphuretted hydrogen and of sulphurous acid. By a series of very careful experiments, Dr. Angus Smith has proved the existence of an excess of carbonic acid in the air of crowded rooms, and in the atmosphere of dense cities, and is disposed to attribute a considerable amount of injurious influence to this excess. That the air of Manchester contains sulphuretted hydrogen in considerable abundance is made evident by the rapid tarnishing of silver plate, and by the darkening of white paint. Now this gas is the most deleterious of them all. It is a direct and powerful poison, destroying life in a few minutes when in a concentrated state, and gradually lowering the vital powers, and reducing the tone of the system, when inhaled in a diluted form; and I know of no circumstance more likely to predispose a population for the reception of fever or cholera than the constant inhalation of an atmosphere vitiated by the presence of sulphuretted hydrogen. I do not believe there is sufficient ammonia in the atmosphere to take up all the sulphurous acid evolved from our chimneys, and the excess must act slightly as an irritant to the lungs. Sulphurous acid, however, except when very concentrated, seems to be breathed with impunity. It has no directly poisonous properties. It is assumed that sulphurous acid and sulphuretted hydrogen could not co-exist in the atmosphere, as they decompose each other; but whether this would be the case in the very dilute state in which they exist in the atmosphere has not been very accurately determined. At all events sulphuretted hydrogen does exist in the atmosphere of Manchester; and to it I should be disposed to attribute much more serious injury to health than to any of the other gases.

From the chimney of a perfect furnace nothing ought to be evolved but invisible carbonic acid, sulphurous acid, and watery vapour. All else, besides the ordinary atmospheric gases, oxygen and nitrogen, are the results of imperfect combustion. All smoke is the result of *distillation* with partial combustion of the product; and distillation of coal in an ordinary furnace means waste of the coal, and injury to the health of the people from poisonous sulphuretted hydrogen and irritant smoke, the consequences of that waste.

Even the sulphurous acid from coal might be considerably diminished by the careful washing out of the iron pyrites, as is already done to a large extent for some purposes; and when it is considered that these pyrites generally or always contain arsenic, which must pass into the atmosphere on combustion of the coal, the advantage of removing the pyrites as much as possible is most important.

In treating the smoke question it has been too much overlooked that in ordinary furnaces coal is subjected to a process partly of combustion and partly of distillation. Were sufficient heat applied, and a sufficient quantity of air of high temperature supplied

at the proper parts of the furnace, combustion would be complete, and no other products than carbonic acid, sulphurous acid, aqueous vapour, and a few salts of ammonia would be possible. There would be no visible smoke. But when coal is burned with air of limited amount or low temperature, then it is partly in the condition of that substance when in a gas retort. It is subjected to partial distillation. In an ordinary furnace this must ever be so. The coal instantly it is placed on the incandescent coke or cinders previously in the furnace begins to distil, and to give off gases and tarry matters. These meeting a certain quantity of hot air are partly decomposed; the hydrogen of the carburetted compounds is first burned and liberates free carbon, which is carried mechanically with other matters and undecomposed gases by the draught into the chimney. When the supply of air of high temperature is not sufficient to do more than this, the matters carried into the chimney will necessarily be such as would be given off by coal in a gas retort mixed with the unburnt carbon, &c., from such portions of the gases and tar as have been acted upon and decomposed by the air supplied. Now one of the most constant products of the distillation of coal in retorts is sulphuretted hydrogen. It is also a very abundant product; and it is quite clear that with a limited supply of air this gas must be formed in common furnaces, and that a portion must escape combustion, and be found in the atmosphere of smoky towns.

Mr. Wye Williams had a very clear conception of the cause of smoke, and proposed to meet the undecomposed gases and the liberated carbon at the back of the furnace by a fresh supply of air, believing that the gases could be sufficiently heated to enable the cold air to effect the combustion; and that the heat of combustion, or in other words the latent heat liberated by the gases on combustion, would be sufficient to maintain a proper heat under the boiler or other apparatus to be heated. This opinion was not justified in practice. It was found that cold air so applied was not sufficient to effect the entire combustion of the distilled matters, and that the latent heat did not compensate for the reduction of temperature caused by the cold air admitted. The experiment was a step in the right direction, but it was seen that for the economical consumption of the distilled gases air must be supplied which had already acquired considerable elevation of temperature before it came in contact with the gases. Many plans have been tried, but none so successfully as that of the Messrs. Siemens, in whose furnace air at a very exalted temperature meets and mixes with the gases at a like heat, in a special chamber. It differs from most others in being a process almost entirely of distillation; and it is a question whether, seeing the impossibility of combustion of large quantities of coal without partial distillation, some such process must not ultimately be adopted. But, while the principle is maintained, it may be necessary to modify the application of it, to meet special requirements. (*For continuation see page xlv.*)

#### Second Quarter.—April, May, June.

*The United Kingdom.*—The Registers of the United Kingdom show that 121,282 persons married in the quarter that ended 30th June; and that the births of 261,044 children, and the deaths of 171,869 persons of both sexes, were registered in the three months.

The corrected death-rate of the United Kingdom—2·385 per cent.—is slightly below that which prevailed in England and Wales. The several facts concerning the other divisions of the Kingdom are fully set forth in the quarterly reports of the Registrars General of Scotland and Ireland.

*England.*—The marriage-rate of the spring quarter was higher than it ever was before in that season since registration began. The birth-rate was also very high, and though it declined afterwards, it was still a little above the average in the three months that ended on June 30th. But a decidedly unfavourable feature of the present Return is the high death-rate that prevailed. The mortality was much higher than it had been in any June quarter of the ten years 1856-65. The coldness of the season, and epidemics of measles and whooping-cough, appear to have exercised a very wide and fatal influence on the public health.

*Marriages.*—In the quarter that ended 30th June 97,154 persons were married in England. The marriages were 48,577 against 45,827 in the same quarter of the previous year. They were more numerous by 10,000 than in the corresponding period of 1856. A marked increase in the marriages of last spring over the numbers of 1864-5 occurs in London, the South-Eastern Counties, Lancashire, the West Riding of Yorkshire, Durham, and Northumberland, and generally in the Midland Counties. The

marriages in London were 8764, in Liverpool and West Derby 1795, in Manchester 1250.

The annual marriage-rate in the quarter was 1·840 per cent. against an average of 1·70, or out of 1000 persons living rather more than 18 would have entered wedlock (while previously, taking one spring quarter with another, the number had been 17,) if the same rate that prevailed in the quarter had been maintained for a year.

*Births.*—The number of children born in the spring quarter (ended 30th June) was 192,427 against 173,263 in the same period of 1856. The annual birth-rate of the quarter was 3·644 per cent. of the population, the average of ten previous springs being 3·620.

The births returned in thirteen weeks ending 30th June numbered 26,776 in London, 1429 in the city of Bristol, 3236 in the borough of Birmingham, 4802 in that of Liverpool, 2591 in that of Leeds, 3353 in the city of Manchester. There were 4893 in Glasgow, a number which slightly exceeds that of Liverpool, though the population of the latter town is greater.

Taking twelve large towns in Great Britain it appears that the birth-rate was highest in Leeds, in which town it was 4·557 per cent.; the next highest was 4·543 in Glasgow; in Newcastle-on-Tyne it was 4·205; in Sheffield 4·009; in Liverpool 3·979. In London and Bristol it was as low as 3·50. But the population of Leeds, there is reason to believe, has been under estimated.

*Increase of Population.*—Whilst the births were 192,427, the deaths were 128,550. The natural increase of population was, therefore, 63,877. The movements of the population modify this result.

The total number of emigrants from ports in the United Kingdom, in the three months ended 30th June, was 80,303, of whom about 19,000 were of English origin; while the Scotch were nearly 5000, and the Irish 45,000. About 65,000 were destined to the United States, a number which exceeds the emigration to the same part in any June quarter in the last twelve years, with the exception of 1864.

*Prices, Pauperism, and the Weather.*—The price of wheat continues to rise; it was 46s. 6d. per quarter in the three months ending 30th June. Omitting the odd pence, the average prices of the six quarters subsequent to 1st January 1865 have been successively 38s., 40s., 43s., 44s., 45s., and 46s. The mean of the highest and lowest prices of beef at Leadenhall and Newgate Markets was 5½d. per lb. last spring quarter. In the same period of 1864 it was 5¼d.; and in that of 1865, 5¾d. The mean price of mutton was 7d. against 6½d. and 7¾d. in the spring quarter of the two previous years. Best potatoes at the Waterside Market, Southwark, were 77s. 6d. per ton. The average number of paupers in the quarter were: relieved in-door 125,044; relieved out-door 734,748. In-door paupers were nearly equal as regards number to those of corresponding periods in the last two years. Out-door relief exhibits a decrease.

Mr. Glaisher writes:—"At the beginning of the quarter the weather was cold, the temperature being below the average to the mean amount of 2°·4 during the first nine days. The nights were also very cold, the thermometer frequently registering below freezing point, and rain fell copiously throughout the first two weeks. On the 10th of April a sudden change to heat set in, continuing till the 28th day, during which time the weather was unusually fine, and very hot for the season, and but little rain descended. This sudden drying weather caused large tracts of land in all parts of the country to be in such a heavy state that spring operations, particularly sowing, were much impeded, and in fact agricultural operations generally were in a backward state. The budding of trees was in general late, but at places where they had not already shot forth their leaves, the effect of this weather was extraordinary, the leaves appearing

and fruit trees blossoming so suddenly, that the whole aspect was changed in a few hours. On the 29th of April a cold ungenial period set in, continuing through May to the 1st of June, with only an occasional day of somewhat warmer character. The mean daily deficiency of temperature during this time amounted to 3°·1, and at night the thermometer frequently fell to below 32°.

"On June 2d, the weather again changed, and became much warmer, and a mean daily excess over the average temperature occurred to the amount of 4°·2, till the 11th day. A cold period followed, but on the 21st day the temperature again increased considerably, and fine weather followed till the end of the quarter, the mean daily excess of temperature amounting to nearly 5°."

The mean temperature of the air in the quarter was 53°, which is near the average. The rainfall was 7·9 inches, which is also near the average at Greenwich; at Carlisle it was 3·6, Truro 9·7 inches.

*Deaths; and the State of the Public Health.*—The deaths in the quarter that ended on June 30th exceed the average of the season. Their number is 128,550, and the mortality, after taking increase of population into account, exceeds the customary rate; for instead of 22 the mortality was at the rate of more than 24 in 1000. The spring quarter is usually not only healthier than the quarter of winter or autumn, but healthier than the whole round of the year; but 24 is 2 in excess of the average of the last ten years.

The country districts, containing about 9,279,270 people, died at the rate of 22 in 1000 in the last spring quarter; a rate exceeding the average (20) of those districts by 2. The town districts, of about 11,903,049 inhabitants, suffered still more, for in them the rate was over 26 in 1000, whereas their average is 23. The increase of the town rate is not only greater absolutely, but greater relatively than the increase of the mortality of the country rate.

Taking the thirteen great cities, as they may be called with regard to their magnitude and standing in the United Kingdom, the mortality, we find, was at the rate of 28 in 1000; in Birmingham, Hull, London, and Bristol 25, in Dublin 26, in Edinburgh 27, Newcastle-on-Tyne 29, Manchester and Salford 30, Sheffield 31, Glasgow 33, Leeds 34, Liverpool 38. In Liverpool the deaths nearly equal the births in number.

When we find that, exposed to nearly the same temperature and not very dissimilar atmospheric conditions, the mortality of the healthy districts, which have been so often cited in the reports, was 20, it is difficult to come to any other conclusion than that there is still something radically wrong in the sanitary administration of the towns of the kingdom. The root of the evil has not been reached. Vast numbers of the population, increasing every year, are blighted by causes which science has discovered, and which hygienic regulations might control. Condensation has an extraordinary tendency to impair the health of the people, and should be met by extraordinary measures.

LONDON is one of the eleven great divisions of the kingdom, and has suffered to about the average extent. The mortality, which was 23 in the previous spring quarter, rose to 25. Not only small-pox, measles, and whooping-cough, but bronchitis and pneumonia grew more fatal. It is to be regretted that the Vaccination Act, which was originally ill-conceived, works badly. The measure requires amendment; and the useless, impracticable registration clauses should be struck out. The deaths in London from diarrhoea were 289, from cholera 24; and a few of the cases of cholera were of an epidemic type; but the deaths both from cholera and diarrhoea were much below the average. In the corresponding quarter of the previous year 706 deaths from diarrhoea, 32 from cholera, were registered.

The SOUTH EASTERN DIVISION comprising Kent, Surrey, Sussex, Hants, and Berks, experienced only a slight increase of mortality. The rate of

the spring quarter was 20; in the previous spring it was 19. Measles and whooping-cough were fatal at Kingston in Surrey; Worthing in Sussex. The deaths in the latter district were 118 against 65 in the corresponding quarter of the previous year. At Alverstoke one case, Southampton 3 cases, of choleraic diarrhoea or infantile cholera are recorded. Measles has been very fatal in Southampton, where the deaths from all causes were 262.

The mortality in the SOUTH MIDLAND COUNTIES was at the rate of 21; that is one above the spring rate of 1865. Measles and whooping-cough were epidemic in some districts.

The EASTERN COUNTIES suffered from the same epidemics; and the mortality was at the rate of 22. One death from summer cholera was noticed at Cromer, and one from typhus.

The SOUTH WESTERN COUNTIES, usually among the healthiest, were also visited by measles and whooping-cough; the mortality was at the rate of 22, one higher than the previous spring rate. Small-pox prevailed fatally, and showed how much vaccination had been neglected by the people of Plymouth.

In proceeding to the WEST MIDLAND COUNTIES we enter a region where the mortality rose to 24, no less than 4 above the previous spring rate. Measles and whooping-cough prevailed extensively; the registrars notice one death from cholera in Madeley, 2 in Wolverhampton, one in Sedgley (Dudley).

In the NORTH MIDLAND COUNTIES the mortality at the rate of 23 was also above the average, owing apparently to the same causes. At Mansfield (Nottinghamshire) the deaths have been much above the average. The whole sewage of the town is poured into a rivulet, from which the water is diverted to work a water-wheel. Scarletina was fatal in Bakewell, and 2 deaths from cholera are noted at Long Sutton (Holbeach).

The NORTH WESTERN DIVISION, comprising Cheshire and Lancashire, sustains its unhappy pre-eminence; the mortality was at the rate of 29, against 25 in the previous spring quarter. Typhus, scarlatina, measles, whooping-cough, and diarrhoea were fatal in several towns, at the head of which Liverpool stands. Ten deaths of Germans from epidemic cholera occurred in the emigrant depôt at Birkenhead. The Registrar of Preston conceives that the resumption of work in the cotton mills, and greater "indulgence in the use of intoxicating liquors," have contributed to the increase of deaths.

Yorkshire has grown more prosperous but less healthy than it was; the mortality was as high as 28. Leeds has suffered severely from fever. One death from cholera is noted at Pudsey (Bradford); 2 deaths of a mother and child were registered at Goole. They were attacked on the voyage from Antwerp. The steamers from Holland and Belgium should be under strict hygienic control; they have no doubt often been the channel for conveying epidemic disease to England. Passengers and cattle were at one time strangely huddled on these vessels.

The mortality in the northern counties was at the rate of 24; or one over the previous spring rate. Measles and whooping-cough killed 40 children in Berwick; they have thus reigned epidemically from south to north.

Wales has not escaped; the mortality was 24; somewhat less than it was last year. Newport and Swansea demand especial care. 49 fatal cases of fever are noted in Newport: 26 of whooping-cough in Lower Merthyr Tydfil. 11 deaths from cholera are recorded at Llangafelach in the Swansea Union. In Gower, near Swansea, 4 cases of "English cholera" occurred in one family; 3 were fatal. The Registrar did not attend them professionally, and he makes the following singular remark: "in fact being poor people they received no medical attention!" Is there no Board of Guardians, no medical officer, in this deplorable district, where in one family three people "being poor" received no medical attention?

On the CAUSES of the VITIATION of the ATMOSPHERE of MANCHESTER, and other LARGE TOWNS, by JOHN LEIGH, Esq., M.R.C.S., Registrar of the Sub-district of Deansgate, Manchester. (Continued from page xli.)

In some comments which the Registrar General had the kindness to insert in his last two quarterly reports I showed that the unhealthiness of Manchester and many other large towns was due mainly to the vitiation of the atmosphere by matters which might be classed under three heads, solid, vaporous (perhaps vesicular or even cellular), and gaseous. I showed that in Manchester and similar manufacturing towns the chief solid impurity of the air is coal smoke, and that its mode of action on the human body is of two kinds, (1) as an irritant to the lungs producing bronchitis or assisting in the production and maintenance of this disease, as well as of some diseases of the substance of the lungs where any previous lesion existed, and (2) by its sulphuretted hydrogen reducing the tone of the system and rendering it easily susceptible of zymotic diseases.

Besides coal smoke there are in such an atmosphere as that of Manchester various solid impurities to which persons who live in the country are less exposed. The houses stand close to the roads or streets, form in fact their boundaries, and from these streets, especially when macadamized, a fine impalpable dust is continually thrown up by the great and incessant traffic of drays and carriages of all kinds, grinding down the material of the road, and loading the air with fine particles, which, when collected on a glass and viewed through a microscope, are seen to consist of sharp and angular fragments. The houses, from their position, are scarcely less free from these particles than the streets; and to the residents they must be a constant source of bronchial irritation. The dust of manufactories must be chiefly confined within their walls, though a certain quantity will also find its way into the streets. It is well known that persons who work in flour mills for any length of time acquire a condition of lungs, from inhalation of flour dust, which gives rise to what is called "miller's asthma," a disease distressing, permanent, and ultimately fatal. Still more rapidly productive of a similar condition, and far more speedily fatal, is the inhalation of metallic particles, as in the case of fork-grinders and others engaged in occupations where metallic dust pervades the atmosphere. In the cleaning of cotton or of woollen rags, a vast amount of dust is given off, and unless carried off by suitable contrivances, as much injury must be produced by it on the lungs of workpeople as by employment in a flour-mill. In fustian-cutting rooms there is a constant fine filamentous dust, which must more or less be present in most departments of the cotton manufacture. Dust, of whatever kind, if long continued is injurious to the lungs, and though it is inevitable in many manufactures, and the ordinary condition of streets and houses in large towns must be more or less dusty, yet all practicable means should be adopted to remedy the nuisance in rooms or workshops, and to keep the streets as free as possible from it. In this respect both the asphalted and the ordinary stone or boulder paved streets are far superior to the macadamized.

The vaporous impurities of the atmosphere arise either from decomposing dead organic matters, or from the processes of putrefaction or fermentation, or they proceed from changes taking place in living animal bodies. They exist either more or less dissolved in the ordinary atmospheric moisture, or in the moisture evaporated with them, or in a distinctly corpuscular form, perhaps vesicular or cellular. They are not simply gaseous, for they do not obey the laws of gaseous diffusion, and they do not condense into a solid form under circumstances in which condensation would be obvious. They are, I believe, vaporous or vesicular, and subject only to atmospheric currents. They will saturate or remain suspended in the stagnant atmosphere of a chamber or court. Some of these, proceeding from living animal bodies, will attach themselves to clothing, and will be carried from place to place. They will pass with the breath from a living animal, or escape with the perspiration from the skin; they are capable of solution by different menstrua, or perhaps of suspension only, and may be made evident by concentrated sulphuric acid and by permanganate of potass. They are able, under favourable circumstances, to reproduce themselves from other organisms, and to excite diseased actions, the same as those from which they themselves originated. They are of many kinds; distinct from each other; unlike in composition, organization, and action. The poisonous emanations of small-pox will not excite scarlatina, nor those of the latter whooping-cough, nor those of whooping cough measles. The emanations of measles will not produce typhus, nor those of the latter cholera. Each kind has its peculiar properties and functions, and produces its particular effect, as distinctly as does nitric, sulphuric, or carbonic acid. The physiologist in this department of physics is in advance of the chemist. The chemist, by passing air charged with any of these matters through strong sulphuric acid, or through a solution of permanganate of potass, obtains a colouring of his test, and announces the presence of organic matter; but the physiologist says: "True, there is organic matter; but there is one poison of cholera, another of typhus, and a third of small-pox; and each of its own kind;" and organic chemistry should make a step forward, and definitively pronounce what they are. They are matters prone to change, able to set up actions in some organic or organized bodies that will produce others similar to themselves. An infinitesimal globule of small-pox matter received into the living body will cover it with pustules, filled with the like matter, and having the



developed where human beings are crowded in cellars or other places in which ventilation and cleanliness are neglected. The poison of cholera, so far as we know, is of comparatively modern origin. It had its birth in the warmer regions of Asia, amongst the miserable devotees who arrived travel-worn at the banks of the Ganges and Jumna.

These various emanations from the human body, the poisonous emanations of small-pox, typhus, scarlatina, &c., and certain natural secretions from the skin and lungs,

TABLE 44.—Mean Annual Value of Meteorological Elements

Table with columns: NAMES OF STATIONS, Elevation in feet above the Sea Level, Latitude, Barometer (Mean, Monthly Range), Thermometer (Mean of highest, lowest, Range, Daily Readings), Mean Temperature (Of the Air, Of the Dew-point).

mainly affect the atmosphere of confined spaces which the sick occupy, or in which many persons are assembled. Wafted into the external atmosphere they probably become so diluted, or suffer such chemical changes, as render them incapable of reproducing their original types. The more general vitiation of the atmosphere, by impurities which I have classed as vaporous, is due to matters given off during the decomposition of dead organic substances.

in the Year 1866. By JAMES GLAISHER, Esq., F.R.S.

Table with columns: Mean Elastic Force of Vapour, Mean Weight of Vapour in a Cubic Foot of Air, Mean additional Weight of Vapour required for Saturation, Mean degree of Humidity of the Air (Saturation=100), Mean Weight of a Cubic Foot of Air, Mean estimated Strength, Wind (Relative Proportion of N, E, S, W), Mean Amount of Cloud (0-10), Number of Days it fell, Amount collected, NAMES OF STATIONS.

scientific knowledge relating to it, that even its physical condition is open to discussion. I have endeavoured, on what I believe to be good grounds, to show that it is not a true gas; but whether it be minutely cellular, or simply vaporous, I do not know. The study of the chemistry of the atmosphere beyond its oxygen, nitrogen, carbonic acid, and ammonia, is yet to be begun. We do not even know whether it contains ozone, as the phenomena attributed to the latter are otherwise explicable. The physiological effects of the east wind are often quite independent of its coldness. A north wind will often cause common colds or catarrhs; but the east wind, which is less cold, frequently produces distinct influenza. I was much struck with this last spring, which was very dry, and during which east winds were prevalent. On one occasion I was several miles from Manchester; quite in the country, and far away from the smoke; the atmosphere was unusually dry, the wind blew from the east, and there was a peculiar haziness in the air, like a fog, so that objects at a moderate distance could not be distinctly seen. In a few hours many people were complaining of influenza. Now this was no common fog; the air was very dry, and the wind not very cold, much less so than a north wind which succeeded it.

It is probable that every heap of decomposing organic matter, every foul ditch or collection of stagnant water, and every polluted stream, that crowded graveyards and manufactories of animal substances, transmit to the atmosphere matters injurious to the human system. The close and festering jungles and estuaries of rivers in tropical regions produce their characteristic fevers; undrained fens, ague and enlarged spleen; and the filth of close, thickly-peopled, and ill-ventilated localities breeds typhus; and even when such grave results are not experienced the general health suffers deterioration.

In country places in England the chief sources of these injurious emanations are the heaps of manure constantly found in close proximity to farmhouses, and to their owners the objects of fond contemplation and delight. So powerful a disinfectant is porous soil, in which, probably, oxygen exists considerably condensed, as it is known to be in charcoal and most porous bodies, that once mixed with it, or well covered by it, the fetid matters of the dungheap become rapidly oxidized, and converted into carbonic acid, water, ammonia, and probably alkaline nitrates. They are decomposed, and rendered harmless. This powerful action of the soil as an oxidizer and decomposer of effete matters should not be overlooked in any arrangements for the removal or utilization of sewage. Oxygen is also much more soluble in water than in nitrogen, so that rain and spring water contain a considerable quantity of the former in solution, ready to act with energy and rapidity on partially decomposed matters. By such benign arrangements a well-drained soil is always sweet and grateful. The perfect chemistry of nature finds a use for all effete matters; and in return for these she gives the tender herb, sweet scented flowers, and fruits.

In large towns we find the sources of atmospheric vitiation of the class under review in undrained and unsewered streets, courts, and houses, in cesspools, foul drains, and streams, graveyards, unsluiced sewers, and wherever animal and vegetable matters are undergoing spontaneous decomposition.

It is probable that no town in England has a sufficient supply of water for all sanitary purposes. The frequent sluicing of sewers is most important to the healthy condition of a town, and the street openings or grids should be closed during the operation. The occasional partial sluicing of sewers by rain, at long intervals, is of doubtful benefit to a town. The foul matters in the sewers become stirred up without being fully carried away; much sulphuretted hydrogen and other gases become liberated, besides decomposing

TABLE 45.—Mean Annual Value of Meteorological Elements

PARALLELS of LATITUDE.	Mean Elevation in Feet above the Sea Level.	Barometer.		Thermometer.						Mean Temperature	
		Mean.	Mean of Monthly Range.	Mean of the highest Monthly Readings.	Mean of the lowest Monthly Readings.	Mean Monthly Range of Readings.	Mean of all the highest Daily Readings.	Mean of all the lowest Daily Readings.	Mean Daily Range.	Of the Air.	Of the Dew- point.
Between the latitudes,—	feet.	in.	in.	°	°	°	°	°	°	°	°
49° and 50°	204	29.580	1.067	64.3	40.3	24.0	56.4	48.0	8.4	50.9	47.3
50° and 51°	68	29.576	1.082	66.8	35.3	31.5	58.6	45.3	13.3	50.9	46.3
51° and 52°	147	29.580	1.105	68.5	32.6	35.9	57.9	43.4	14.5	50.0	45.6
52° and 53°	147	29.571	1.124	68.6	31.6	37.0	57.4	42.7	14.7	49.2	43.9
53° and 54°	235	29.530	1.189	66.5	31.2	35.3	55.1	42.2	12.9	48.2	42.9
54° and 55°	97	29.506	1.281	66.1	29.5	36.6	55.7	42.1	13.6	48.2	42.9
Allenheads	1360	29.478	1.175	60.9	26.3	34.6	50.6	37.9	12.7	42.7	38.7
North Shields	124	29.582	1.215	61.5	32.8	28.7	51.8	41.9	9.9	45.8	41.3
Milton, Banbridge (Ireland).	200	29.481	1.256	64.2	29.3	34.9	54.2	41.0	13.2	47.1	41.6
Between the latitudes,—	287	29.543	1.166	65.3	32.1	33.2	55.3	42.7	12.6	48.1	43.4

substances or vapours; a current of air opposed to that of the stream in the sewers is originated, and escapes at the grids or street-outlets; for the gas in the sewers is lighter than atmospheric air, and ascends to the street openings, instead of following the stream of liquid to the outlet of the sewer.

It may seem to be of little consequence whether we regard these emanations as purely gaseous, vaporous, or existing in some other subtle form. But the more accurate the conception we form of their physical conditions the more likely are we to arrive at their distinctive characters and properties. Some attempts have been made in this direction already. Dr. Calvert has made a chemical examination of the odorous matter infecting the atmosphere from an unhealthy ulcer, and has shown it to possess basic properties; and other investigators have endeavoured to establish a relation between certain cryptogamic sporules and marsh fever.

The question has also a practical bearing in relation to general sanitary arrangements; for whilst the true gases are obedient to a law of rapid diffusion, from mutually repulsive property of their particles, and pass into the general body of the surrounding air, the law being that the diffusive power varies inversely as the square root of the density of the gas itself, the gases retaining under all atmospheric temperatures and pressures their gaseous condition; yet vapours of highly complex constitution are generally of low tension, and speedily attain their condition of maximum density. It is probable that the vaporous matters exist in the condition of cloud, if clouds may be defined as "masses of air which contain innumerable minute particles of suspended matter condensed from a state of vapour." Whether this condition is intermediate between fully formed vapour and liquid, and is constituted of minute vesicles, as maintained by Saussure and other observers, is at the present time undetermined. There is a good deal to be said both for and against the theory; but in any case, whether vesicular or in a finely divided liquid form, or even approaching the solid form, it is evident that they are not, like true gases, capable of diffusion, but can be acted upon only by atmospheric currents;—they can be wafted and blown away, but *not diffused*. The practical bearing of this then is, that wherever a confined district is in a bad sanitary condition, where zymotic or infectious diseases prevail, where bad smells are evident, and there are indications that matters not properly belonging to a pure atmosphere are floating or suspended in it, after removal, as far as practicable, of the causes producing the emanations, effectual currents of air should be drawn through the courts, alleys, houses, &c. that are the seats of contamination.

Very difficult is the task in a large town where abominations have grown to a magnitude commensurate with the town itself. Private munificence, of which a splendid example has lately been given to the world, should be directed into this channel in every English town. Unfortunately, in many districts, the very habits of the people are fatal to all efforts at improvement. With water at their doors, their houses and persons are inconceivably dirty. With the windows constantly closed, particularly of their sleeping rooms, the atmosphere of their apartments is reeking and noisome to an extent incompatible with health; and it is in such districts that when an epidemic breaks out it finds its greatest number of victims. In cholera maps, shaded in the ratio of mortality, the blackest tints cover these localities. But pestilence, once established, is not confined to these places, it spreads to better districts, and involves rich and poor in like disaster. All ranks of persons are vitally interested in the sanitary condition of their towns or villages; and upon all it rests as a sacred duty to assist in promoting so great and noble an enterprise.

in the Year 1866 for different Parallels of Latitude.

Mean Elastic Force of Vapour.	Mean Weight of Vapour in a Cubic Foot of Air.	Mean additional Weight of Vapour required for Saturation.	Mean Degree of Humidity of the Air. Saturation = 100.	Mean Weight of a Cubic Foot of Air.	Wind.				Mean Amount of Cloud (0-10).	Rain.		PARALLELS of LATITUDE.
					Mean estimated Strength.	Relative Proportion of				Number of Days it fell.	Amount collected.	
in.	grs.	gr.	°	grs.	N.	E.	S.	W.	days.	in.	Between the latitudes,—	
.333	3.8	0.5	89	538	2.2	7	6	7	10	4.9	44.5	49° and 50°
.320	3.6	0.7	85	540	1.5	7	5	7	11	5.2	187	50° and 51°
.300	3.4	0.9	82	539	1.1	6	5	8	11	7.0	201	51° and 52°
.294	3.3	0.7	83	541	1.0	6	5	8	11	6.5	188	52° and 53°
.283	3.2	0.7	84	539	1.1	6	6	7	11	6.9	216	53° and 54°
.281	3.2	0.7	82	540	0.7	4	7	8	11	6.7	191	54° and 55°
.239	2.7	0.5	85	522	2.2	5	4	8	13	6.3	287	Allenheads.
.265	2.9	0.6	85	545	1.6	7	5	7	11	5.6	208	North Shields.
.266	3.0	0.7	81	540	2.5	5	4	12	9	5.0	213	Milton, Banbridge (Ireland).
.237	3.2	0.7	84	538	1.5	6	5	8	11	6.0	209	Between the latitudes,— 49° and 53°

Third Quarter.—July, August, September.

*The United Kingdom.*—The Registers of the United Kingdom show that the births of 239,873 children, and the deaths of 150,855 persons of both sexes, were registered in the three months ending on September 30th.

The marriages of the United Kingdom in the quarter ending September 30th were 56,924.

The corrected death-rate of the United Kingdom—2·061 per cent.—is less than that prevailing in England and Wales. The several facts concerning the other divisions of the Kingdom are set forth in the reports of the Registrar General of Scotland and the Registrar General of Ireland.

*England.*—The marriage-rate of the summer quarter was above the average. The birth-rate of the quarter was near the average. The country was visited by cholera, and the mortality was raised much above the summer average by the epidemic in some districts, while the rest of the kingdom was unusually healthy.

*Marriages.*—There were married in the summer quarter (ended 30th September) 92,514 persons; against 89,350 and 91,704 in the two corresponding periods of 1864–65. Of marriages in London the number was 9038. Lancashire exhibited a marked increase, the marriages in the last three summer quarters in the seat of cotton manufacture having been successively 6534, 6628, and 7075. But while the marriage-rate prospered in the Manchester district, where the numbers in the three periods were 1105, 1200, and 1277, it declined in Liverpool as the returns show; in the two previous summers 1210 and 1112 couples married, and last summer only 1082.

If the marriage-rate in England that prevailed last summer were maintained for a year, the proportion, to the population, of persons who entered wedlock would be 1·726 per cent. against an average of 1·621. Seventeen marrying persons in a thousand of the population is a high annual rate for the first nine months; but it would be low if it occurred in the autumnal quarter, namely, the last three months of the year.

*Births.*—In the quarter ending 30th September 179,095 children were born. The number was about 2000 less than in either of the two previous summer quarters. The annual birth-rate for the quarter was 3·344 per cent., the average of 10 corresponding quarters (1856–65) being almost identical, namely, 3·343 per cent.

TABLE 46.—Meteorology of Greenwich

YEARS.	Mean Weekly Movement of the Air in Miles.*	Departure from Average.	Fall of Rain in Inches.	Departure from Average.	Mean Dryness of Atmosphere.	Departure from Average.	Mean TEMPERATURE of the AIR.	Departure from Average.
	Miles.	Miles.	Inches.	Inches.	°	°	°	°
1849	1868	+110	23·9	0·0	6·6	+ 0·8	50·0	+ 0·7
1850	1841	+143	19·7	- 4·2	6·1	+ 0·3	49·3	- 0·0
1851	1780	+ 32	21·6	- 2·3	6·5	+ 0·7	49·2	- 0·1
1852	1781	+ 33	34·2	+10·3	7·4	+ 1·6	50·6	+ 1·3
1853	1597	-101	29·0	+ 5·1	6·2	+ 0·4	47·7	- 1·6
1854	1731	+ 33	18·7	- 5·2	4·7	- 1·1	48·9	- 0·4
1855	1659	- 39	21·1	- 2·8	4·5	- 1·3	47·1	- 2·2
1856	1775	+ 77	22·2	- 1·7	5·6	- 0·2	49·0	- 0·3
1857	1562	-136	21·4	- 2·5	5·2	- 0·6	51·0	+ 1·7
1858	1626	- 72	17·8	- 6·1	6·5	+ 0·7	49·2	- 0·1
1859	1398	-100	25·9	+ 2·0	6·0	+ 0·2	50·7	+ 1·4
1860	1676	- 22	32·0	+ 8·1	4·6	- 1·2	47·0	- 2·3
1861	1666	- 32	20·8	- 3·1	5·0	- 0·8	49·4	+ 0·1
1862	1690	- 18	26·2	+ 2·3	4·7	- 1·1	49·5	+ 0·2
1863	1775	+ 77	20·0	- 3·9	6·0	+ 0·2	50·3	+ 1·0
1864	1597	-101	16·7	- 7·2	7·0	+ 1·2	48·5	- 0·8
1865	1553	-145	29·0	+ 5·1	6·2	+ 0·4	50·3	+ 1·0
1866	1917	+219	30·7	+ 6·8	5·6	- 2·2	49·8	+ 0·5
Average	1698	—	23·9	—	5·8	—	49·3	—

\* Approximated to the results of Robinson's Anemometer by reductions from Whewell's up to 1859.

*Increase of Population.*—The deaths last quarter were 116,653, and if compared with the births there is a difference in favour of the latter of 62,443, which number represents the natural increase of population.

The total number of emigrants in the September quarter from ports in the United Kingdom where Emigration Officers are stationed was 47,153; they were as many as in the same period of 1864, but not so many as in that of 1863, and few as compared with emigrants who left in the summer of 1865. Taking round numbers, 36,000 (of whom half were natives of Ireland) out of the 47,000 went to the United States, nearly 7000 to the Australasian and nearly 4000 to the North American colonies.

*Prices, Pauperism, and the Weather.*—The price of wheat, which had been gradually rising from 38s. per quarter in the March quarter of 1865 to 46s. in the spring of the present year, suddenly rose last quarter to 51s. Beef was also dear last quarter, the mean price having been 6½d. per lb., as sold by the carcass at Leadenhall and Newgate Markets, against 5½d. and 5¾d. in the corresponding period of 1864 and 1865. Mutton did not rise, the price having been 5¾d. for inferior and 8¼d. for superior quality; the mean price 6¾d. Best potatoes at Southwark rose to 97s. 6d. per ton. Thus the tendency of provision markets was decidedly upward.

The quarterly average number of paupers relieved on the last day of each week was, in-door 120,985, out-door 717,555. The former number is rather high for the season, but the latter number shows a decrease, probably owing to the lateness of the harvest, by which labourers would be engaged longer than usual in field work.

The mean temperature of the air in the quarter at Greenwich was 58°·9, which is 1°·1 below the average of the season in twenty-five years. Each of the three months, but particularly August, was cold. The rain-fall measured 7·9 in., half of which was in September, when the amount was an inch and a half in excess of the average. Mr. Glaisher writes that the weather, which had been warm and fine at the close of the previous quarter, changed to cold at the beginning of July, and in every part of the country rain fell almost daily. From the 9th to the 17th was a period of heat, but from the 18th July to the 27th September the temperature was almost constantly low. Rain fell frequently all over the country in July; and in August seriously interrupted harvest work. In September the atmospheric pressure was always low, and in Guernsey and the west of England eight or nine inches of rain fell; near the east coast three inches; about London four inches. In the midland counties there were floods;

in the Eighteen Years 1849–1866.

MEAN TEMPERATURES of the AIR in the Quarters ending the last day of								YEARS.
March.	Departure from Average.	June.	Departure from Average.	Sept.	Departure from Average.	Dec.	Departure from Average.	
°	°	°	°	°	°	°	°	
41·9	+ 2·1	51·7	- 0·9	61·0	+ 0·8	44·8	+ 0·1	1849
39·4	- 0·4	53·5	+ 0·9	59·6	- 0·6	44·7	- 0·0	1850
41·9	+ 2·1	51·5	- 1·1	59·8	- 0·4	43·7	- 1·0	1851
41·4	+ 1·6	51·2	- 1·4	61·8	+ 1·6	48·1	+ 3·4	1852
38·1	- 1·7	51·8	- 0·8	58·5	- 1·7	42·3	- 2·4	1853
40·8	+ 1·0	51·7	- 0·9	59·8	- 0·4	43·7	- 1·0	1854
34·1	- 5·7	50·5	- 2·1	60·4	+ 0·2	42·7	- 2·0	1855
40·0	+ 0·2	52·3	- 0·3	59·9	- 0·3	44·2	- 0·5	1856
39·2	- 0·6	53·8	+ 1·2	63·3	+ 3·1	47·9	+ 3·2	1857
37·8	- 2·0	54·3	+ 1·7	61·0	+ 0·8	43·8	- 0·9	1858
43·3	+ 3·5	55·7	+ 1·1	62·8	+ 2·6	43·3	- 1·4	1859
38·8	- 1·0	50·5	- 2·1	56·2	- 4·0	42·6	- 2·1	1860
39·9	+ 0·1	51·8	- 0·8	60·4	+ 0·2	45·5	+ 0·8	1861
41·0	+ 1·2	53·3	+ 0·7	58·8	- 1·4	45·0	+ 0·3	1862
42·6	+ 2·8	53·1	+ 0·5	56·8	- 1·4	46·8	+ 2·1	1863
37·9	- 1·9	53·1	+ 0·5	59·4	- 0·8	43·7	- 1·0	1864
36·5	- 3·3	56·2	+ 3·6	62·5	+ 2·5	46·0	+ 1·3	1865
41·2	+ 1·4	53·0	+ 0·4	58·9	- 1·3	46·2	+ 1·5	1866
39·8	—	52·6	—	60·2	—	44·7	—	Average.

thousands of acres were under water, and much damage was done. In the three visitations of cholera in past years there was great atmospheric pressure, high temperature, narrow diurnal range owing chiefly to high night temperature, defect of rain, wind, and electricity; and in the last of those (1854) a remarkable blue mist was observed which prevailed night and day. In nearly all these particulars the meteorological character of the present epidemic season is different from that of previous periods when cholera prevailed; but the blue mist has been again visible; it was first seen by Mr. Glaisher on 30th July, and by other observers in the preceding week. Since that time it has been generally present; on some days no trace of it visible, and on other days seen for parts of a day only. It has extended from Aberdeen to the Isle of Wight, and was of the same tint of blue everywhere. This mist increased in intensity when viewed through a telescope; usually no mist can be seen when thus viewed; it increased in density during the fall of rain, though usually mist rises from rain. Its density did not decrease when the wind was blowing moderately strong; it decreased when a gale was blowing, but increased again on its subsidence. Whatever may be its nature, he adds, the fact is very remarkable, that since the cholera period of 1854 this phenomenon has not been observed till the present time.

*Deaths; and the State of the Public Health.*—116,653 deaths were registered in the 92 days ending September 30th; and the annual rate of mortality was 2·179 per cent. This exceeds the average mortality of the last ten summer quarters by ·177, or one twelfth part; and the excess on the population is equivalent to 9475 deaths. The deaths returned from cholera amounted to 10,365; the deaths from diarrhoea, also due in great part to the same cause, to 9570.

The mortality was at the rate of 25 per 1000 in the large town districts, and 18 in the village and small town districts; the excess in the large town districts was 7. The mortality in the town districts was considerably above its usual summer average; while in the rest of the country the increase was slight.

The three months of July, August, and September are now usually the healthiest of the year in England; and their average annual rate of mortality per 1000 is 20, but their mortality during these months in the present year was at the rate of 22.

The mortality of London was at the rate of 29 in 1000; of the North Western Division 27; in the two Northern Divisions and in Wales, the mortality was at the rate of 22. In the other divisions the mortality was low, and indeed lower than their average: in the South Eastern Division

TABLE 47.—Average Annual Rate of Mortality to 1000 of the Population in the 11 Divisions of England in the 10 Years 1851-60, and in the Year 1866.

DIVISIONS.	AVERAGE ANNUAL RATE OF MORTALITY to 1000 LIVING in the					
	10 Years 1851-60.	Year.	Winter Quarter 1866.	Spring Quarter 1866.	Summer Quarter 1866.	Autumn Quarter 1866.
I. LONDON - - - - -	23·63	26·30	26·66	25·29	28·86	24·38
II. SOUTH EASTERN COUNTIES -	19·55	19·42	21·85	19·81	18·11	17·90
III. SOUTH MIDLAND COUNTIES -	20·44	20·14	22·85	21·03	17·62	19·07
IV. EASTERN COUNTIES - - -	20·58	20·13	23·19	21·61	18·10	17·62
V. SOUTH WESTERN COUNTIES -	20·01	20·38	23·85	21·86	17·30	18·52
VI. WEST MIDLAND COUNTIES -	22·35	22·01	26·54	24·16	17·48	19·84
VII. NORTH MIDLAND COUNTIES -	21·16	20·77	24·01	22·58	17·58	18·89
VIII. NORTH WESTERN COUNTIES -	25·51	29·21	33·84	28·74	27·31	26·96
IX. YORKSHIRE - - - - -	23·09	25·63	29·60	27·59	22·03	23·28
X. NORTHERN COUNTIES - - -	21·99	23·90	24·43	23·95	21·95	25·27
XI. MONMOUTHSHIRE AND WALES	21·23	22·79	23·92	23·45	22·31	21·49

Note.—The above mortality for the year 1866 is the mean of the quarterly rates.

it was 18, in the South Midland it was 18, in the Eastern 18, the South Western 17, the West Midland 17, and in the North Midland Division 18.

Upon turning to the large cities of the United Kingdom, still greater divergences are observed; the mortality was at the rate of 19 in Birmingham, 21 in Bristol, 22 in Hull, 24 in Sheffield, 26 in Salford, 31 in Manchester, 32 in Newcastle-upon-Tyne, 50 in Liverpool. In Edinburgh the rate of mortality was 23, in Glasgow 25, in Dublin 24. The excessively high rates of mortality are generally due to the invasion of cholera.

It is well known that this epidemic raged around us in France, Belgium, and Holland earlier in the year, and during July it established itself in England, where it put the sanitary defences of nearly every district on the coasts to the test. Indeed the cholera matter (*Cholrine*) has evidently been diffused all over the kingdom; for in every county, except Herefordshire and Rutlandshire, deaths from cholera have been registered, and diarrhoea has prevailed to such an unusual extent as to imply the existence of some specific zymotic element. It was only, however, when that element was diffused by water, and by the wilful neglect of hygienic precautions, that the mortality became appalling.

Thus, although the waters are yet by no means free from impurities, the people of London are no longer supplied as they were in 1849 with unfiltered waters contaminated by their own sewers; and the deaths in the districts of the West, North, Centre, and South of London were 1023 by cholera and 1558 by diarrhoea, among 2,430,046 people. Whereas 3691 deaths by cholera and 740 by diarrhoea, that is, 4,431 together, occurred in the East London districts, among 607,945 people supplied with water chiefly from the Old Ford reservoir of one company. Deduct these deaths, and the deaths by cholera in London are reduced to 1023, while the deaths by cholera in England are reduced from 10,365 to 6674. Again, of the 2022 deaths from cholera in Lancashire and Cheshire no less than 1603 were registered in the Liverpool and West Derby Districts alone. Deduct these deaths, with 2447 more in West Ham (adjoining East London, and supplied with the same water), in Portsea Island, in the Isle of Wight, Southampton, Exeter, with three adjacent districts of South Devon and Swansea, as well as in certain districts of South Wales, and the deaths from cholera in the rest of England are brought down to 2624.

This proves that although the freest intercourse has been kept up between the various parts of the country the epidemic has only assumed an aggravated form where the defences have been weak and circumstances have been in its favour.

By some fatality, Dr. Trench, the able medical officer of health for Liverpool, "ceased to have any direct voice in the cholera arrangements so soon as the Orders in Council were issued." Energetic measures were, however, adopted by the vestry with his approval.

On the other side of the Mersey is Birkenhead, exposed to the same epidemic influences as Liverpool; and in that district the deaths from cholera only amounted to 30 out of a population of more than 61,420.

Dr. Baylis, the Medical Health Officer, thus describes the successful precautions taken at Birkenhead:—

In addition to ordinary measures, we commenced a system, before its appearance, of deodorizing all the worst middens in the town, on the principle that, if we could destroy the gases of decomposition in the worst parts of the town, we should remove one of the greatest depressants of the vital force; this system was carried out more effectually after the disease appeared.

I saw the first patient that died, and my friendly connexion with all the medical men of the place enabled me to reach nearly every succeeding fatal case. To the friends of each I gave the most urgent instructions, furnished the poor with disinfectants, sprinkled their floors with carbolic acid, had chloride of lime regularly thrown in their and neighbouring ashpits, used carbolic acid in their waterclosets and drains; took, in the first instance, and until the guardians moved, the responsibility of burning the soiled bedding; had all the soiled clothes steeped in chlorine water, and saw that the houses were perfectly cleansed down. Finally the body was partially covered with charcoal, and buried in a few hours.



By these means the disease, I think, was in most instances stamped out; and I feel sanguine, if there was a proper staff for the purpose, with the necessary power, together with the means of getting at every case attacked, a medical officer, accustomed to his duties, and otherwise competent, would have a good chance of keeping down the malady, where the conditions were not so very bad as to preclude all chance of success.

I confess, however, with every wish to do our duty, for want of more power, the careless, the drunken, and the stolid poor defeat one occasionally, and then we had, in some instances, a second and a third case in the same house. These, however, were the exceptions.

The mortality of Birkenhead on the south side of the Mersey, was at the rate of 24 in 1000, while the mortality in the borough of Liverpool on the north bank of the river was 50. The deaths in Liverpool at the Birkenhead rate would have been about 2906; the actual deaths were 6091.

The cholera has prevailed, as on former occasions, in particular fields. The London cholera field, by extension down the Thames, reached Ramsgate. The second considerable field lies round the Solent along the coast from Portsmouth and Southampton to Newport in the Isle of Wight. The Exeter field extended beyond Torbay to Totnes and Brixham. The Liverpool field extended to Chester, Wigan, and Bolton, but scarcely touched Manchester. The Swansea field was visited with extreme severity; and although the mortality was concentrated mainly on Swansea, Neath, and Llanelly, it was felt all over Glamorgan, Carmarthen, and Pembroke, as far as Haverfordwest.

The epidemic has been most fatal on the sea coast, in the chief ports of the kingdom. It is by no means capricious, but obeys definite laws. It never destroys the people to any extent where the water supply is pure, or where the hygienic conditions are good, when the authorities adopt judicious and well organized measures of early treatment and systematic disinfection.

Those districts which are supplied with bad water, have no effective system of sewage, have no Health Officer, and have no precautions in force, should immediately set their houses in order, as they are still in imminent danger.

#### Fourth Quarter.—October, November, December.

*The United Kingdom.*—The Registers of the United Kingdom show that the births of 247,112 children, and the deaths of 157,803 persons of both sexes, were registered in the three months ending on December 31st.

The marriages of the United Kingdom in the quarter ending December 31st were 68,771.

The corrected death-rate of the United Kingdom—2·164 per cent.—is less than that prevailing in England and Wales. The several facts concerning the other divisions of the Kingdom are set forth in the Reports of the Registrar General of Scotland and the Registrar General of Ireland.

*England.*—The birth-rate was unusually high, the death-rate below the average, the marriage-rate above the average. The aspect of these returns is favourable in every respect. Marriages have abounded, births have followed in unusual numbers, and deaths, in spite of an imminent epidemic, have been less frequent than in the corresponding seasons of former years. Hygienic measures have been prosecuted with unusual activity, and apparently with good results.

*Marriages.*—In the last three months of 1866 the number of persons married was 110,726. The marriages were 55,363, and were less by 1625 than in the corresponding period of the previous year. In London the number of marriages was 9103 against 9738 in the December quarter of 1865; in the West Midland counties 6386 against 6981; in Yorkshire 6129 against 6285; in the Northern counties 3013 against 3284. In the counties of the cotton manufacture the marriages maintained their activity better, the number there having been 8653 against 8583.

During the last three years the marriage-rate has been unusually and persistently high; and this statement holds equally good in respect to the last quarter of 1866, though in it the marriage rate (2·064) was not so high as in the same period of 1865, when it was 2·146, which proportion represents *persons married* to a hundred of the whole population. The average rate of the December quarter in the ten years 1857–66 is 1·99.

*Births.*—The number of children born last quarter (ended 31st December) was 185,594; it exceeded by 6000 the number of births in the autumn of 1865. To this increase nearly the whole kingdom appears to have made more or less contribution; but in Cornwall there was a very striking decrease of births, for the number fell in that county from 3051 to 2652, a fact hardly to be accounted for except by active emigration.

The annual birth-rate in the quarter was high; it was 3·458 per cent. against an average of 3·32.

In thirteen large towns in the United Kingdom the births in the last quarter were relatively to population most numerous in Leeds, where the birth-rate per annum was as high as 4·318 per cent. In Sheffield the rate was not much lower, having been 4·198; in Glasgow it was 4·024; it did not touch 4 per cent. in Hull, but was 3·963; in Liverpool it was 3·873; in Salford 3·854; in Birmingham 3·739; in Newcastle-on-Tyne 3·624; in London 3·571; in Manchester and Edinburgh it slightly exceeded 3·5, and in Bristol did not attain that point.

*Increase of Population.*—The deaths last quarter were 117,352; and as the births were 185,594, the balance was in favour of population, and the natural increase 71,242.

The emigration of the December quarter from ports in the United Kingdom, where emigration officers are stationed, comprised 32,909 persons; these being nearly as many as in the same period of 1864, but much fewer than in that of 1863 or 1865. Of that number about 11,351 were of English, 2676 of Scotch, 14,666 of Irish origin. Giving round numbers, 26,000 out of the 33,000 were destined to the United States, of whom 7000 were English, and 13,000 Irish. The main current of emigration being westward, Liverpool was the chosen port of embarkation to 21,000. Only 2954 persons left the Thames. From London and Liverpool, emigrants for Australia went in nearly equal numbers.

*Prices, Pauperism, and the Weather.*—The price of wheat has been constantly rising for two years; and in the last three months of 1866, when it was on an average 56s. 8d. per quarter, it was much higher than it had been since the September quarter of 1862. The average prices of beef by the carcase at Leadenhall and Newgate Markets were 4½d. per lb. for inferior, and 7d. for superior qualities. They showed a slight tendency to decline from the high prices that had ruled in the summer. The prices of mutton fell; the lowest and highest averages were respectively 5¼d. and 7½d.; they were lower than they had been previously since the early part of 1865. Potatoes were dear. The mean price of the best at the Waterside Market, Southwark, was 107s. 6d. per ton. Prices ranged from 85s. to 130s., and were higher than they had been for three years.

The average number of in-door paupers relieved on the last day of each week was 134,086, a number which is more by five or six thousand than it had been in the corresponding period of either of the two previous years. Out-door paupers were 735,654 against 724,792 in the autumn of 1865.

The close of the September quarter was distinguished by much rain and the want of sunshine, and by south-west winds which had long prevailed. In the first week of October the barometer rose, the wind changed to north-east, and the mean temperature for eleven days was 3° above the average. This was followed by a week of cold weather. From 19th October to the end of the quarter the temperature was in excess without any considerable interruption, except from 28th November to 2d December, in which period the weather was cold.

October closed with variable weather, sometimes with fog, at others with rain, and occasionally white frosts at night. In the beginning of November barometric pressure exhibited great fluctuations; snow fell in Scotland; and throughout the month the weather was changeable. In December there was frequent rain, and there were very heavy gales from the south-west; but the month was unusually mild for the season. The last two months were favourable for agricultural operations. In November ploughing and sowing made great progress, except in Yorkshire and Lancashire, where about the middle of the month were extensive floods; and at the end of the year the pastures were of a fresh green, and food for cattle was abundant.

At Greenwich in each month the mean temperature was above the average. It was  $51\cdot3^{\circ}$  in October,  $44\cdot3^{\circ}$  in November,  $42\cdot9^{\circ}$  in December; the mean of the quarter was  $46\cdot2^{\circ}$ . Rain fell to the amount of 5·4 in. in the quarter, which is 1·7 in. below the average.

*Deaths; and the State of the Public Health.*—117,352 deaths were registered in the 92 days ending on the last day of the old year, and the mortality was at the annual rate of 2·187. The mortality is thus lower than the average by ·018, and not higher than the mortality of the last summer quarter, when it was raised by cholera in East London, in Liverpool, and in some other towns.

The chief characteristic of the season is the diffusion of cholera over the remotest parts of the kingdom, and its restricted ravages everywhere except where the people are living in the open violation of the laws of health. In London 834 deaths by cholera were returned, and in the districts around a small number: in Godstone 5, Dartford 1, Rochester 2, Lewes 6, Brighton 3, Southampton 2. In the Eastern and South-Midland counties the disease is scarcely noticed; in Devonshire, Exeter and its environs suffered to some extent; thus, 8 persons died of the disease in St. Leonard; 30 in Kenton, including 26 in the county lunatic asylum. The 8 deaths in St. Leonard occurred close to the river Exe, which receives all the sewage of Exeter, and is dammed up by a weir at the fatal point. The deaths in the lunatic asylum demand explanation. Teignmouth on the coast had 7 deaths from cholera; Brixham, the fishing town at the entrance of Torbay, supplied with bad water, 30; a small parish in the Crediton district called Zeal-Monachorum, on a tributary of the Tay, 15; St. George in Bedminster 12. These isolated outbreaks were rendered fatal by local causes. In the midland counties of the north and west a few deaths are noticed. In Chester (Great Boughton) 83 deaths from cholera, 42 from diarrhoea occurred; the water with singular irrationality having been for some time taken at a point in the river immediately below the inflow of several of the town sewers. Cholera, which had been so fatal in Liverpool, subsided after having caused many deaths, and the epidemic caused 30 deaths in the township of Ince, where the water was bad, but scarcely touched Manchester or Salford. In Doncaster, with sewage in the waters, it raised the mortality above the average. Three fatal cases of cholera occurred at Beverley; the first case, that of a man, was imported; the others were respectively the wife who had attended the man, and the wife's sister by whom the wife had been attended. Due precautions should be inculcated in such cases. Hull and Sculcoates, which in former epidemics suffered so severely, now escaped with comparative impunity. In many towns and colliery villages of Durham and Northumberland cases of cholera occurred in considerable numbers; 107 persons died of cholera in Tyne-mouth and 27 of diarrhoea. The hygienic conditions are of the worst description, and the authorities often appear to slumber in the presence of danger. While the industry of Wales is making rapid strides, its sanitary condition is rapidly deteriorating, as due arrangements are not made for the accommodation or instruction of an increasing population; and thus in a country every way by nature favourable to health, both as regards air and water, epidemics find footing and prove destructive. In Tredgar sub-

district 82 persons died of cholera; in Ystradyfodwg 24; in Aberdare 29; in Ystradgunlais 50; in Llangafelach 31; in Swansea 55; in Holywell, where a well was polluted with sewage, 39; in Carnarvon, 70; in Holyhead, 25. Following fevers and other zymotic diseases there can be no question of the evil, which may well attract the attention of Welsh patriotism.

The returns contain many examples of the efficacy of hygienic measures, and afford strong proofs of the doctrine that if England has suffered less from cholera in the present year than the Continent, or less than England herself in former years, it is mainly due to changes which all Europe can appreciate and adopt.

Among other instances the Black country, as it is called, about Wolverhampton, may be cited. The epidemics of 1849 and 1854 destroyed in five districts more than three thousand lives, while in the year 1866 the mortality has been inconsiderable. The water was formerly impure, and could only be obtained with difficulty in a country covered with pits and works. But the people with commendable energy have brought good waters from a distance, and are reaping the advantages of the change in Wolverhampton, Bilston, and the other towns.

The mortality in all the country districts of England was at the rate of 19; in the town districts at the rate of 24, in 1000; but in both town and country below the average in nearly an equal degree. In the divisions the mortality of the quarter was lowest (18) in the eastern and south-eastern counties; highest in the northern counties (25), and in Lancashire and Cheshire (27), where the rate exceeded that of London (24).

The thirteen great towns of the United Kingdom stand thus arranged in the order of mortality for the quarter: Bristol 21, Birmingham 22, Hull 23, London 24, Sheffield 24, Salford 26, Leeds 28, Glasgow 29, Manchester 30, Edinburgh 30, Liverpool 33, Dublin 34, Newcastle-on-Tyne 37.

#### THE UNITED KINGDOM IN THE YEAR 1866.

In the United Kingdom 1,013,746 births and 665,562 deaths were registered in the twelve months, thus making the natural increase 348,184, or at the rate of 953 daily. The recorded number of emigrants was 204,882, or 561 daily. The difference between the emigrants and the registered natural increase was 392 daily.

The birth-rate per 1000 of the year was 35·48, the death-rate 23·01, for the United Kingdom, after a correction for the defective registration of Ireland.\*

The birth-rate per 1000 of England proper was 35·54, the death-rate 23·61; the numbers for the previous year, 1865, are 35·63 and 23·41; the shade of excess in the death-rate of 1866 being due to cholera, for the mortality is lower in all the divisions except those in which cholera prevailed.

The eleven divisions may thus be arranged in the order of annual mortality: the deaths per 1000 were in the South-Eastern Counties 19, Eastern counties 20, South-Midland counties 20, South-Western counties 20, North-Midland counties 21, West-Midland counties 22, Monmouthshire and Wales 23, Northern counties 24, Yorkshire 26, London 26, North-Western counties (Lancashire and Cheshire) 29.

\* In calculating the birth-rate and death-rate, 1-third has been added to the births, 1-fourth to the deaths registered in Ireland; so that, while the registered births and deaths are 1,013,746 and 665,562, the estimated numbers corrected for defective registration in Ireland become 1,062,402 and 688,960. The natural increase on the corrected numbers was 1,023 daily, and the difference between the emigrants and the natural increase on the corrected numbers was 462 daily.

Health of London in 1866.

LONDON is growing greater every day, and within its present bounds, extending over 122 square miles of territory, the population amounted by computation to 3,037,991 souls. In its midst is the ancient city of London within and without the walls, inhabited at night by about 100,000 people, while around it, as far as a radius of 15 miles stretches from Charing Cross, an ever thickening ring of people extends within the area which the Metropolitan Police watches over, making the whole number on an area of 687 square miles around St. Paul's and Westminster Abbey 3,521,267 souls.

This population has many interests in common as regards water, air, sewage, lighting, streets, railways, poor, government, as well as police; and many of its members, residing in the outer zones at night, transact business by day in offices, shops, markets, courts, clustered in the centre of the metropolis. Thus there are daily currents inwards and outwards, and the people are blended together in a thousand ways, so as to form a natural community.

The national census is taken in England to show in each place the numbers found during the census night, as they represent the population with which the deaths and other important statistical elements can be compared. The corporation of the city of London, however, very naturally struck by the significance of the fact that the population returned at the census within the ancient limits under the jurisdiction of the Lord Mayor was only 113,387, and was constantly declining, so that in a few years he might appear to be left, by night, the lord of an empty realm (*inania regna*)\*, determined to take a census to catch the throng of people in the city during the day. This has been done with considerable labour, and the results are published in an interesting report by Mr. Lawley and by Mr. Scott, the Chamberlain.† They show by their day census in April 1866 that 283,520 persons reside during the active hours of the day in the city of London where only 113,387 persons were found by the national census on 8th April 1861, and where, at the rate of decrease observed between 1851 and 1861, there could have been no more than about 102,887 in the middle of 1866. The classes that come and go, they say, "comprise some of the most influential, wealthy, and enterprising of our fellow countrymen; bankers, merchant-princes, brokers, and wholesale traders, carrying on business which has no parallel in the world, and contributing in the aggregate a larger share of the public revenues than any, and even

\* *Ibant obscuro sola sub nocte per umbram,  
Perque domos Ditis vacuas, et inania regna.*—*Virgil, Æneid, Book vi.*

† Report on Day Census of City of London, 1866.

TABLE 48.—LONDON.—Births and Deaths in the Fourteen Years 1853 to 1866.

YEARS.	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866
BIRTHS	82254	84885	85532	87430	89577	89012	92909	93414	97064	97850	102119	102625	106803	108665
DEATHS	60669	73697	61942	57274	59103	64003	61860	62309	65251	67371	71060	78238	73531	80453
Excess of BIRTHS over DEATHS	21585	11188	23590	30156	30474	24919	31049	31105	31813	30479	31059	24387	33272	28212
BIRTHS { Males	42132	42988	43501	44410	45885	45347	47330	47645	49835	49882	52277	52383	54051	55249
{ Females	40122	41897	42031	43020	43692	43665	45579	45769	47729	48468	49842	50242	52752	53416
DEATHS { Males	30852	37151	31354	29076	29769	32579	31577	31657	33105	34288	38354	39551	37578	41092
{ Females	29217	36546	30588	28198	29334	31514	30283	30652	32146	33083	34706	38687	35953	39361
ANNUAL MORTALITY per 1000	24.41	29.43	24.31	22.09	22.41	23.90	22.69	22.49	23.18	23.56	24.47	26.53	24.56	26.48

"than all similar classes in other parts of the empire."\* This is true enough, but the reporters probably underrate the residents when they go on to say that "the night population of the city consists to a great extent of the caretakers of city premises and their families, and of tradesmen and others too inconsiderable to possess a suburban or other residence," for the census shows among the night population a number of clergymen, lawyers, physicians, surgeons, merchants, and respectable tradesmen, who, it is to be presumed, form a chief part of the constituency of the wards by which the 232 common councilmen and aldermen are elected. The reporters enumerate 679,744 passengers into the city in the 16 hours between 5 a.m. and 9 p.m., a number necessarily greater than the number of persons entering, as the same person often enters and is counted more than once. A similar but a less extensive movement of the people to and from Westminster and the other central districts of the metropolis is going on: in Manchester, Liverpool, and all the large cities of the kingdom, the same thing is met with. The great boroughs overflow on all sides.

While the other towns of the kingdom are mainly governed under the Municipal Act by councils elected by open voting (5 & 6 Wm. IV. c. 76.), the city of London is left in the enjoyment of its ancient privileges, and the rest of the metropolis is governed by 38 parish vestries or boards under the provisions of the Metropolitan Management Act (18 & 19 Vict. c. 120.) The government in the 38 bodies consists of 2279 vestrymen elected by ballot. The city of London has a common council of 232 members, including the Lord Mayor and 25 aldermen. The metropolis has thus, in the aggregate, 2511 members in its 39 Parliaments. Each district, as well as the City, sends one or two members to the Metropolitan Board of Works, consisting of a chairman and 45 representatives. Every district is bound under the Act of Parliament to appoint one or more health officers; and St. George, Hanover-square, has appointed 2, Poplar 2, Wandsworth 5, Plumstead 4, and each of 34 districts 1, making in the aggregate 47 medical officers, who have rendered the people of London excellent service during the year. Woolwich has some pretence for not appointing a medical health officer, and has availed itself of the privilege.

The jurisdiction of the Metropolitan Board of Works extends over the whole area of the London registration division, except Mottingham; it also takes in the hamlet of *Penge*, which is in the Croydon registration

\* Mr. Haywood, Engineer to the City Commission of Sewers, says, in an extract quoted by the reporters,—“There are 68 members of Parliament who have offices within the city, and are to be found there daily throughout a large portion of the year.”—Report, p. 14.

TABLE 49.—LONDON.—Deaths in Public Institutions, 1855-66.†

	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866
TOTAL DEATHS IN PUBLIC INSTITUTIONS	11310	10381	(53 weeks) 10079	10004	9638	9550	10276	11313	(53 weeks) 11112	12731	12116	13054
IN WORKHOUSES	6552	5797	5714	5535	5228	5161	5757	6401	6187	7055	6715	7088
PRISONS	71	81	71	57	40	41	46	53	64	125	99	95
MILITARY AND NAVAL ASYLUMS	299	304	235	317	307	272	251	307	289	315	278	195
GENERAL HOSPITALS	2956	2859	3008	3094	2927	3039	3234	3167	3169	3558	3854	3813
HOSPITALS FOR SPECIAL DISEASES	441	612	332	272	431	413	335	690	827	982	1002	1167
LYING-IN HOSPITALS { Women	27	14	11	11	35	34	38	35	11	24	26	22
{ Children	40	31	23	32	51	57	58	40	37	48	42	50
MILITARY AND NAVAL HOSPITALS	404	282	180	211	187	173	223	236	203	215	176	146
HOSPITALS AND ASYLUMS FOR FOREIGNERS	64	61	63	53	46	47	53	74	61	82	71	96
LUNATIC ASYLUMS	456	340	392	422	381	313	276	310	264	327	353	382

† This Table is compiled from the Weekly Returns made by the Registrars of London, and relates to the 52 or 53 weeks of each year.

district, and contained around the Crystal Palace 5015 people in 1861, on an area of 840 acres. The rateable annual value of property by the county rate assessment for 1867 is 15,261,999*l.*; the amount required by the Metropolitan Board for that year from the several parishes is 222,167*l.*, including 26,380*l.* from the city of London, which enjoys an annual income from all sources of about 200,000*l.*\*

The main drainage sewers, with the exception of the northern low level, are now in active operation. They were commenced in January 1859, and formally opened on April 4th, 1865. The length of these main sewers is 82 miles; and with the pumping stations and other works cost about 4,200,000*l.* They carry off the drainage of about 117 square miles, having a population estimated by the Board at 2,800,000. The sewage intercepted daily amounts to 14,000,000 cubic feet, equivalent to 396,406 cubic metres, or to about as many tons by weight; † the quantity discharged at Barking from the sewers north of the Thames being to the quantity discharged from the southern sewers at Crossness in the proportion of 10 to 4. The report of the Board justly refers to the necessity of a constant and abundant water supply for London, both for domestic use and for the purification of the sewers; but it does not refer to the defect in that part of the present drainage system which is under the control of the vestry-boards, and still deprives the people of the full advantages that the main drainage is destined to bestow.

The mortality of London was above the average in nearly all, except the west and the south districts; but the excess in the east districts was exceptionally great, for it was 34 instead of 26 per 1000, owing to a violent explosion of cholera in the field of the East London Water Company.

\* Municipal Corporation Directory, 1866, p. 465.

† Report of Metropolitan Board of Works, 1865-6, pp. 16-17.

TABLE 50.—LONDON.—Deaths and Meteorology, 1849-66.

YEARS.	Total Number of Deaths.	Mean Temperature of Air.	Dryness of Atmosphere.	Fall of Rain in Inches.	Mean Weekly Amount of Horizontal Movement of the Air, approximated to the results of Robinson's Anemometer by reductions from Whewell's to 1859. †	WEEKLY AVERAGE OF 1866.						
						Number of Deaths weekly.	Mean Temperature of Air.	Average daily Range of Temperature.	Dryness of Atmosphere.	Fall of Rain in Inches.	Amount of Horizontal Movement of the Air in each Week. §	
1849	68756	50.0	6.6	23.9	Miles. 1808							
1850	48950	49.3	6.1	19.7	1841							
1851	55488	49.2	6.5	21.6	1730							
1852	54633	50.6	7.4	34.2	1781							
1853	60069	47.7	6.2	29.0	1597							
1854	73697	48.9	4.7	18.7	1731							
1855	61942	47.1	4.5	21.1	1659							
1856	57274	49.0	5.6	22.2	1775							
1857	59103	51.0	5.2	21.4	1562							
1858	64093	49.2	6.5	17.8	1626							
1859	61860	50.7	6.0	25.9	1598							
1860	62309	47.0	4.6	32.0	1676							
1861	65251	49.4	5.0	20.8	1666							
1862	67371	49.5	4.7	26.2	1680							
1863	71060	50.3	6.0	20.0	1775							
1864	78238	48.5	7.0	16.7	1597							
1865	73531	50.3	6.2	29.0	1553							
1866	80453	49.8	5.6	30.7	1917							
						1866						
						First Quarter	1557	41.2	12.5	4.8	9.3	2140
						Second Quarter	1494	53.0	19.7	7.7	8.0	1804
						Third Quarter	1702	58.9	17.2	6.3	8.0	1725
						Fourth Quarter	1429	46.2	11.7	3.8	5.4	2001

† For the years 1849-59 the results are only approximative, having been reduced to Robinson's Anemometer from observations made with Whewell's.

§ By Robinson's Anemometer.

13,054 of the 80,453 deaths in London took place in public institutions; 7,088 of them in the 46 workhouses under the control of the vestries and boards of guardians; 4980 in the London general and special hospitals; 95 in prisons.

The meteorology of the year presented some peculiarities. The mean temperature was half a degree above the average of 25 years; but it was not so cold in the winter and autumn, nor so warm in the spring and summer months as usual. The mean temperature of June was above the average of that month; the mean day temperature at Greenwich having been 73.2°, the mean night temperature 52.0°. The wind blew 142 days from the West; 60 from the East; 101 from the South, and 62 from the North. The daily amount of horizontal movement was 274 miles; while in the previous year it was 222 miles. The rainfall was 30.5 in., which is 6.8 in. above the average.

TABLE 51.—Population; Births and Deaths; Annual Birth and Death Rates; Mean Temperature and Rainfall, in the Year 1866, in LONDON and TWELVE other LARGE TOWNS.

CITIES, &c.	ESTIMATED POPULATION in the Middle of the Year 1866.	BIRTHS in 52 Weeks ending 29th Dec. 1866.	DEATHS in 52 Weeks ending 29th Dec. 1866.	ANNUAL RATE to 1000 living during the 52 Weeks ending 29th Dec. 1866.		MEAN TEMPERATURE in 52 Weeks ending 29th Dec. 1866.	RAINFALL in inches in 52 Weeks ending 29th Dec. 1866.
				Births.	Deaths.		
TOTAL - - - -	6,093,349	223,752	173,687	36.85	28.60	49.6	33.7
LONDON - (Metropolis) -	3,037,991	107,992	80,129	35.67	26.47	49.9	30.5
BRISTOL - (City) -	163,680	5,656	4,064	34.67	24.91	49.9	40.2
BIRMINGHAM - (Borough) -	335,798	12,877	8,042	38.48	24.03	49.3	31.1
LIVERPOOL - (Borough) -	484,337	19,080	20,202	39.53	41.85	50.7	26.1
MANCHESTER - (City) -	358,855	12,966	11,426	36.25	31.95	48.6	42.9
SALFORD - (Borough) -	112,904	4,307	3,268	38.28	29.04	48.4	42.9
SHEFFIELD - (Borough) -	218,257	8,806	6,121	40.48	28.14	47.6	34.3
LEEDS - (Borough) -	228,187	9,962	7,401	43.81	32.54	48.5	30.6
HULL - (Borough) -	105,233	4,150	2,564	39.57	24.45	..	..
NEWCASTLE-ON-TYNE (Borough)	122,277	4,868	3,914	39.95	32.12	47.2	22.2
EDINBURGH - (City) -	175,128	6,221	4,777	35.64	27.37	47.1	28.3
GLASGOW - (City) -	432,265	18,170	12,745	42.18	29.58	47.1	47.6
DUBLIN (City and some suburbs)	318,437	8,697	9,034	27.40	28.47	49.1	26.8





TABLE showing the OCCUPATIONS, SEX, and general DESTINATION of the EMIGRANTS in 1866—continued.

OCCUPATION.	UNITED STATES.	BRITISH NORTH AMERICA.	AUSTRAL-ASIA.	ALL OTHER PLACES.	TOTAL.
<b>ADULT MALES—continued.</b>					
Locksmiths, Gunsmiths, &c. - -	5	—	4	—	9
Millers, Maltsters, &c. - - -	51	8	13	1	73
Millwrights - - - - -	7	1	5	—	13
Miners and Quarrymen - - -	4,387	1,336	224	83	6,030
Painters, Paperhangers, Plumbers, and Glaziers - - - - -	225	9	53	1	288
Pensioners - - - - -	3	2	1	5	11
Printers - - - - -	79	5	20	—	104
Rope Makers - - - - -	5	6	—	—	11
Saddlers and Harness Makers -	26	2	15	—	43
Sail Makers - - - - -	1	2	—	—	3
Sawyers - - - - -	12	3	34	—	49
Seamen - - - - -	261	69	29	4	363
Shipwrights - - - - -	8	2	12	—	22
Shopkeepers, Shopmen, Warehousemen, &c. - - - - -	341	46	81	19	487
Smiths, General - - - - -	1,068	31	72	3	1,174
Spinners and Weavers - - -	570	52	5	—	627
Sugar Bakers, Boilers, &c. - -	29	—	1	—	30
Surveyors - - - - -	3	2	7	—	12
Tailors - - - - -	1,080	192	24	1	1,297
Tallow Chandlers and Soap Makers	1	—	1	—	2
Tanners and Curriers - - -	21	1	5	1	28
Turners - - - - -	28	—	4	—	32
Wheelwrights - - - - -	16	—	18	3	37
Wool Combers and Sorters - -	2	—	2	—	4
Trades and Professions not before specified - - - - -	2,004	596	285	95	2,980
Not distinguished - - - - -	13,219	338	1,542	1,819	16,918
<b>ADULT FEMALES.</b>					
Domestic and Farm Servants, Nurses, &c. - - - - -	4,218	150	3,692	183	8,243
Gentlewomen and Governesses -	220	129	145	75	569
Milliners, Dressmakers, and Needlewomen - - - - -	472	5	78	1	556
Married Women - - - - -	17,420	1,524	3,014	843	22,801
Shopwomen - - - - -	—	1	1	—	2
Trades and Professions not before specified - - - - -	100	6	18	1	125
Not distinguished - - - - -	24,169	1,233	1,830	434	27,666
<b>CHILDREN.</b>					
Male Children, 1 to 12 years - -	11,351	1,071	1,877	311	14,610
Female do. do. - - - - -	10,227	808	1,692	296	13,023
Infants, Males - - - - -	3,005	295	298	86	3,684
Do. Females - - - - -	2,907	264	334	64	3,569
Not distinguished as to age, Males -	4,169	323	—	585	5,077
Do. Do. Females - - - - -	2,422	118	—	192	2,732
<b>TOTAL - - - - -</b>	<b>161,000</b>	<b>13,255</b>	<b>24,097</b>	<b>6,530</b>	<b>204,882</b>

TABLE 57. POPULATION OF THE UNITED KINGDOM,

with Army, Navy, and Merchant Seamen abroad belonging thereto.\*

Middle of Years.	PERSONS.	MALES.	FEMALES.
1801 -	16,302,410	8,096,082	8,206,328
1811 -	18,532,522	9,194,348	9,338,174
1821 -	21,300,573	10,519,256	10,781,317
1831 -	24,423,588	12,004,025	12,419,563
1841 -	27,077,095	13,325,889	13,751,206
1851 -	27,764,034	13,656,998	14,107,036
1861 -	29,358,927	14,397,427	14,961,500
(Estimated.) 1866 -	30,339,861	14,784,947	15,554,914
1867 -	30,551,276	14,864,733	15,686,543
1868 -	30,763,648	14,944,968	15,818,680

\* In estimating the number of men in the Army, Navy, and Merchant Service abroad, a certain proportion belonging to foreign countries and the colonies has been excluded. In 1811 the troops and seamen were 640,500, but as this number included natives of colonies and foreign parts, only 502,536 were taken.

[The above numbers (1801-61) have been deduced by raising the enumerated population of the United Kingdom, including the islands in the British Seas, (see Table 9. p. 84. of Vol. III. Census of England and Wales, 1861,) up to the middle of the respective Census years. In 1866, 1867, and 1868 the numbers have been estimated by adding the population enumerated in the islands in the British Seas in 1861, and the number of men in the Army, Navy, and Merchant Service abroad, (see Tables 3. and 16. pp. 81. and 87. Vol. III. Census 1861,) to the population for 1866, 1867, and 1868, returned in Table 59. pp. lxx-lxxi.]

TABLE 58.—Logarithms of the above Population of the UNITED KINGDOM.

Middle of Years.	PERSONS.	MALES.	FEMALES.
1801 - -	7.2122518	6.9082749	6.9141489
1811 - -	7.2679345	6.9635210	6.9702620
1821 - -	7.3283913	7.0219850	7.0326718
1831 - -	7.3878095	7.0793269	7.0941063
1841 - -	7.4326020	7.1246962	7.1383408
1851 - -	7.4434825	7.1353552	7.1494358
1861 - -	7.4677402	7.1582849	7.1749751
1866 - -	7.4820136	7.1698198	7.1918676
1867 - -	7.4850293	7.1721571	7.1955273
1868 - -	7.4880379	7.1744950	7.1991702

