CIRCULATION.—COUNTRY BANKS.

Average amount of Promissory Notes in Circulation in ENGLAND *and* WALES, *for each Week ended on a Saturday during the Fourth Quarter (Sept.—Dec.) of* 1858; *and also the Average of Promissory Notes in Circulation in* SCOTLAND *and* IRELAND *during the Four Weeks ended on the* 23*rd Oct., the* 20*th Nov., and the* 18*th Dec.*, 1858.

ENGLAND AND WALES.				SCOTLAND.				IRELAND.		
DATES.	Private Banks. (Fixed Issues, 4·40.)	Joint Stock Banks. (Fixed Issues, 3·30.)	TOTAL. (Fixed Issues, 7·70.)	Four Weeks, ended	£5 and upwards.	Under £5.	TOTAL. (Fixed Issues, 3·09.)	£5 and upwards.	Under £5.	TOTAL. (Fixed Issues, 6·35.)
1858.	Mlns. £	Mlns. £	Mlns. £	1858.	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
Oct. 2	3,43	2,99	5,42							
,, 9	3,52	3,04	6,56							
,, 16	3,56	3,04	6,60							
,, 23	3,53	2,97	6,50	Oct. 23	1,49	2,57	4,06	3,33	3,36	6,69
,, 30	3,50	2,96	6,46							
Nov. 6	3,48	2,98	6,46							
,, 13	3,45	2,98	6,43							
,, 20	3,40	2,96	6,36	Nov. 20	1,64	2,74	4,38	3,36	3,47	6,83
,, 27	3,39	2,93	6,32							
Dec. 4	3,34	2,88	6,22							
,, 11	3,31	2,85	6,16							
,, 18	3,26	2,84	6,10	Dec. 18	1,61	2,74	4,35	3,25	3,50	6,75

FLUCTUATIONS *in the Stock and Share Markets during the* YEAR 1858.

Stocks and Railway Shares.	Amount per Share.	Amount Paid.	Price on the 1st Jan. '57.	Highest Price during the Year.	Lowest Price during the Year.	Price 31 Dec.'57.
Consols	....	....	93¾ to ⅞	98¾	93⅜	96¾
Exchequer Bills	....	....	2*s.* pm.	45*s.* pm.	par.	37*s.* pm.
RAILWAYS—						
Brighton	Stock	100	108	114	104	112
Caledonian	,,	,,	85½	97¾	70½	88¾
Eastern Counties	,,	,,	60	65¼	57	64
Great Northern	,,	,,	98	109	96½	107½
Great Western	,,	,,	56¼	63	48¼	56¾
London and North-Westn.	,,	,,	98¾	102¼	87½	97½
Midland	,,	,,	92	104½	89⅜	103¾
Lancashire and Yorkshire	,,	,,	94¾	99¾	87	99½
Sheffield	,,	,,	39¼	41¾	32¼	40
South-Eastern	,,	,,	72½	76¼	65	75¾
South-Western	,,	,,	97½	100	90	95¼
Berwick	,,	,,	98	100	88½	95
York and North Midland	,,	,,	86	87¾	68⅝	78
Northern of France	16	All	38¾	40¾	35½	40
East Indian	Stock	100	113	114½	100½	108¾

QUARTERLY JOURNAL

OF THE

STATISTICAL SOCIETY.

JUNE, 1859.

Twenty-Fifth Anniversary Meeting of the Statistical Society.

[Held at the Rooms of the Society, 12, St. James's Square, London, on Tuesday, 15th March, 1859.]

RIGHT HON. HOLT MACKENZIE, *Vice-President, in the Chair.*

MR. NEWMARCH, one of the Honorary Secretaries, read the following Report of the Council on the Progress of the Society during the past year:—

Report of the Council for the Financial Year ended 31*st December*, 1858, *and for the Sessional Year ended March*, 1859.

THE Council have the pleasure of reporting a satisfactory condition of the Society at the completion of the first quarter of a century of its career.

At the present time (March, 1859), the Number of Fellows is 359 (including 72 Life Members) as against 367 (including 71 Life Members) at the corresponding date last year (1858). During the twelve months now ended, the losses by resignations and death have been 23, and the admissions have been 15.

The Income of the Year ended 31st December, 1858 (omitting the Banker's Balance from 1857), has been 824*l.*, and the Expenditure 682*l.*, leaving a surplus in the Year of 142*l.*, and providing an actual Balance at the Bankers to be carried to 1859, of no less than 311*l.*—a larger balance than the Society has possessed for a very long period. The amount of Liabilities at the close of 1858, included no more than the usual items.

Availing themselves of the funds at their disposal, the Council have just completed the publication of a CATALOGUE of the Library

of the Society. The publication of this Catalogue can scarcely fail to be an important aid to the pursuits of the Fellows.*

It has also been a leading object in the recent numbers of the *Journal*, to introduce, under the title of Quarterly Returns, carefully prepared and condensed summaries of the more important Monthly Official Tables relating to Imports, Exports, Shipping, Bullion, Poor Relief, &c.; so that the Fellows may possess, in a scientific form, a continuous register of some of the most essential of the data indicative of the progress of the country.

The Monthly Meetings have been well attended.

The following is a List of the Papers which have been read:—

Mr. Wilkinson.—On Railway Terminal Accommodation, and its Effects on Traffic Results.

Mr. Lumley.—On the Administration of Relief to the Poor in the Metropolis.

Mr. Hendriks.—On Indian Revenues and Taxation.

Mr. Welton.—On the Occupations of the People of England and Wales.

Mr. Willich.—On the Population of England and France.

Mr. Roberts.—On the *Congrès de Bienfaisance* at Frankfort, 1857.

Mr. Lamanski.—On Russian Statistics.

Rev. C. B. Robinson.—On the Statistics of Prices in the Peculiar of Snaith (Yorkshire), in the Sixteenth, Seventeenth, and Eighteenth Centuries.

Mr. Fox.—On the Vital Statistics of the Society of Friends.

Mr. Chadwick.—On the Statistical Evidence of the Results of Competition for Whole Fields of Service.

Mr. Newmarch.—On the Electoral Statistics of England and Wales. Part II. Results of Further Evidence.

The proceedings at Leeds of the Section (F) of Economic Science and Statistics, under the able Presidency of Mr. Edward Baines, a gentleman whose fame and eminence as a statist have been long recognized, fully maintained the interest which has gradually been established in connection with that Department of the labours of the British Association for the Advancement of Science.

The Council have great pleasure in placing on record that the Second Meeting in October last, at Liverpool, of the National Association for the Advancement of Social Science, under the Presidency of Lord John Russell, afforded probably the most signal proof hitherto disclosed, of the deep importance which is at length

* The price of the Catalogue is 2*s.* 6*d.* to Fellows and 3*s.* 6*d.* to non-Fellows. Copies may be obtained by Fellows at the Society's Rooms.

attached by the general public to the pursuits and inquiries which five and twenty years ago were first made the object of distinct recognition by the formation of this Society.

In connection with the name of Lord John Russell, the Council have the gratification to announce that his Lordship has acceded to their request to place him in nomination this day for the office of President, in succession to Lord Stanley, whose tenure of office ceases, in conformity with the rules.

Among the losses by death during the year, the Council have had the painful task of including the name of Mr. Hallam. Mr. Hallam was one of the Founders of this Society, and one of its most active supporters in its earlier years. For a long period our list of Officers has been graced and fortified by his name as a trustee; and the Council, in their own name, and in that of the Fellows, desire to share in the deep and general expressions of admiration for Mr. Hallam's attainments and of respect for his character, which have arisen in all parts of the country.

Dr. Camps moved, and Dr. Truman seconded, the Adoption of the Report, together with the Abstract of Receipts and Expenditure, and the Balance Sheet of Assets and Liabilities.

A Ballot was then taken for the President, Council, and Officers for the ensuing twelvemonths, and the following was declared to be the List:—

COUNCIL AND OFFICERS FOR 1859-60.

President.

Right Hon. Lord John Russell, M.P.

Council.

Charles Babbage, M.A., F.R.S.
James Bird, M.D.
Sir John Peter Boileau, Bart., F.R.S.
Samuel Brown
James Caird, M.P.
William Camps, M.D.
Edward Cheshire
Viscount Ebrington
William Farr, M.D., D.C.L., F.R.S.
Albany Fonblanque
Rt. Hon. Wm. Ewart Gladstone, M.P.
James William Gilbart, F.R.S.
Francis Henry Goldsmid, Q.C.
William Augustus Guy, M.B.
Peter Hardy, F.R.S.
Right Hon. the Earl of Harrowby.
Bernard Hebeler
Frederick Hendriks
James Heywood, F.R.S.
William Barwick Hodge
Thomas Hodgkin, M.D.
William Golden Lumley
The Right Hon. Holt Mackenzie
William Newmarch
The Right Hon. Sir John Somerset Pakington, Bart., M.P.
Right Hon. Lord John Russell, M.P.
Right Hon. Lord Stanley, M.P.
John Strang, LL.D.
Colonel W. H. Sykes, M.P., F.R.S.
Richard Valpy
James Wilson M.P.

The names of the New Members of the Council are placed in Italic.

Treasurer.

William Farr, M.D., F.R.S.

Honorary Secretaries.

William Newmarch | William Augustus Guy, M.B. | William G. Lumley.

Mr. Fox moved, and Mr. Galsworthy seconded, a vote of thanks to the retiring President, Council, and Officers.

Mr. Hodge moved, and Mr. Hendriks seconded, a vote of thanks to the Chairman.

Mr. Mackenzie, in returning thanks, advocated the claims of the Society for support upon public men, and especially on Members of either House of Parliament. It had been said that Members of Parliament had a plentiful supply of Statistics. This was true: but the object of the Society was to place the results deduced from the rude and undigested mass of Parliamentary Returns in an intelligible form. He hoped that every Fellow would do his utmost to keep up the numbers of the Society, by bringing its merits to the notice of his friends.

The following is the Report of the Auditors:—

"The Auditors, appointed to examine the Accounts of the Statistical Society for the year 1858, herewith report:—

"That they have carefully compared the Entries in the Books, with the several Vouchers for the same, from the 1st January to the 31st December, 1858, and find them perfectly correct; showing the Receipts (including a Balance of 168*l.* 16*s.* 7*d.* from 1857) to have been 993*l.* 4*s.* 9*d.*, and the Payments 681*l.* 19*s.* 2*d.*, leaving a Balance in favour of the Society of 311*l.* 5*s.* 7*d.* They have also had laid before them an Estimate made by the Council of the Assets and Liabilities of the Society; the former amounting to 1,899*l.* 5*s.* 7*d.*, and the latter to 170*l.* 7*s.* 3*d.*,—showing a balance in favour of the Society of 1,728*l.* 18*s.* 4*d.*

"G. Sowray,
"Frederick Purdy,
"Samuel Brown, } *Auditors.*"

London, 3rd February, 1859.

The statement of Receipts and Payments, and Assets and Liabilities, is as follows:—

RECEIPTS AND PAYMENTS FOR THE YEAR 1858, AND ASSETS AND LIABILITIES ON 31ST DECEMBER, 1858.

RECEIPTS.

	£	s.	d.
Balance from 31st December, 1857, viz.:—			
Cash at Bankers £168 19 8			
Less Petty Cash overdrawn 3 1			
	168	16	7
Dividends	26	6	9
Subscriptions—282 for 1858 at £2 2*s.* . . . . . £592 4 –			
2 for 1859 at £2 2*s.* . . . . . 4 4 –			
Arrears—8 at £2 2*s.* . . . . . 16 16 –			
	613	4	–
Compositions—3 at £21	63	–	–
Journal Sales	66	3	5
Advertisements in Journal	65	15	–
	£993	4	9

PAYMENTS.

	£	s.	d.
Rent	75	–	–
Salaries	180	–	–
Printing Journal	295	5	1
Advertising	21	2	6
Library	15	15	3
Index and Catalogue	7	6	6
Stationery and Sundry Printing	43	13	5
Incidental Expenses	16	11	9
Ordinary Meetings	20	12	7
Fire and Light	7	16	–
Special Outlays (Committee on Beneficent Institutions)	20	13	6
Postage and Receipt Stamps	8	2	8
	681	19	2
Balance carried to 1859, viz.:—			
Cash at Bankers . . . . . £304 – 2			
Petty Cash in hand 7 5 5			
	311	5	7
	£993	4	9

ASSETS.

	£	s.	d.
Cash Balance	311	5	7
Investments—			
3 per Cent. Consols, £328 15*s.* 4*d.*, ... cost £300			
New 3 per Cents., £567 17*s.* –*d.*, ... " 507	807	–	–
Property—Books in Library £400			
Journals in Stock 200			
Furniture 100			
	700	–	–
Arrears recoverable	21	–	–
	£1,899	5	7

LIABILITIES.

	£	s.	d.
Printing Journal, December, 1858	70	9	–
Stationery and Sundry Printing	14	6	3
Index and Catalogue	66	5	6
Advertising Journal, December, 1858	5	12	9
Office Expenses, viz.:—Carpenter £7 8 6			
Lighting . . . . . 7 – 3			
Glazier . . . . . 4 8 –			
	18	16	9
Sundries	4	17	–
	170	7	3
Balance in favour of Society	1,728	18	4
	£1,899	5	7

On the Vital Statistics *of the* Society *of* Friends.

By Joseph John Fox, *Surgeon, Stoke Newington.*

[Read before the Statistical Society, 21st December, 1858.]

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I.—*Introduction.*

In presenting the following summary of such numerical facts as I have been able to collect, relative to the Society of Friends, I have to regret that they are so incomplete. Although the records of the Society have been kept with great care, but little pains have been bestowed on abstracting them in an available form. Some years ago, the records of births, marriages, and deaths for the whole of England and Wales, from the commencement of the Society to the middle of 1837, were collected in the metropolis. It is from those records that much of what I have to offer is derived; since that epoch, the data I have been able to obtain are very scanty, and derived from sundry sources.

The following are the authorities on which I have drawn for the facts of this paper:—

1. A valuable paper on the Statistics of the Society of Friends, by Dr. Thurnam, formerly Resident Medical Officer of the "Retreat," near York, now of the Wiltshire County Lunatic Asylum. It is an appendix to his volume on the "Statistics of Insanity:" though without a date, it bears internal evidence of being written about 1845.

2. The "Annual Monitor," a small periodical volume, giving a short account of Members of the Society in Great Britain and Ireland dying within the previous year. Of late years this has been very carefully executed, and contains a summary of the deaths

according to age. The volume for 1849 presents a valuable enumeration of the Society, made in the middle of 1847, distinguished according to sex and age.

3. The marriages in the Society, since 1837, are returned in the annual reports of the Registrar-General.

4. Some few matters are derived from miscellaneous sources, and abstracts of the records, made by private individuals.

The Society of Friends has existed for rather more than two centuries. They have been accustomed from their origin, to keep a careful record of all births and deaths happening among them, and of all marriages solemnized according to their rules. Until about the middle of the last century, there was no such thing as distinct membership in the Society; the general term "professing with "Friends," including all that were in the practice of attending their meetings. About that era, membership was defined, and members became a distinct body; yet they continued to register the births and deaths of those who were not members of the Society, and only gradually distinguished them on the registers. Those born of parents who are members of the Society, being members by birthright, the Society forms a population including all ages. It is subject to slight increase by the accession of new members from what is termed "convincement;" it is subject to decrease by emigration, by resignation of membership, by disownment for moral delinquency, and disownment for marrying one not a member. There is little doubt that of late years these causes of decrease have outweighed the slight increase from the accession of new members.

II.—*Numbers of the Society.*

I am acquainted with only two enumerations of the Society. The first, made in the summer of 1840, gives the number of members as follows: unfortunately the sexes were not distinguished in the returns from Ireland.

(A.)—*Society of Friends.—Numbers in* 1840.

Country.	Males.	*Females.*	Total.
England and Wales	7,388	8,389	16,277
Scotland	79	69	148
Ireland	?	?	3,280
Great Britain and Ireland	?	?	19,705

The other return, made on 30th of June, 1847, was procured by the editors of the "Annual Monitor." It gives the following numbers:—

(B.)—*Society of Friends.—Numbers in June*, 1847.

Country.	Males.	*Females.*	Total.
England and Wales	7,050	8,295	15,345
Scotland	72	75	147
Ireland	1,470	1,771	3,241
Great Britain and Ireland	8,592	10,141	18,733

During the interval of seven years there had been a decrease amounting in the case of England and Wales, to 5·72 per cent.; of Ireland to 1·19 per cent. The decrease in England and Wales was among the males 4·57 per cent., while among the females it was considerably greater, amounting to 6·68 per cent. This larger decrease in the female sex is a point of some interest, to which I shall advert in the sequel.

Although no other complete census of the Society has come to my knowledge, we have some partial ones made in 1820 and 1830, with which I need not trouble the Society, merely observing, that if we assumed them approximately to represent the whole body, they lead to the inference that the rate of decrease had gone on increasing between 1820 and 1847.

The valuable "Census of Religious Worship" gives no information of the number of members, and is, therefore, of no use for the purposes of this paper. Yet it may be worth while to compare its return of "Attendants" with what we may estimate to have been the number of members on the Census-Sunday. If the rate of decrease continued the same after 1847, as it had been in the previous seven years, the Society would consist of 15,000 members on 30th of March, 1851; whereas the number of persons present in the 362 meetings of the Society on the morning of that day, was 14,016. This deficiency of 1,000 must be due to the absentee members exceeding the non-members present to that amount; but as Mr. Mann's estimate of 58 per cent. of the population being able to attend Divine Worship, cannot be at all applicable to a religious body like the Society, we are unable to estimate how large a proportion of the attendance consisted of that rather numerous class who frequent the meetings of the Society, but are not members.

III.—*Marriages in the Society.*

The following are the number of marriages performed "after "the manner of Friends," in England and Wales, in each decade from the commencement of the Society to 1856.*

(C.)—*Society of Friends.—Marriages* 1650-1856.

Prior to 1650	9	1760-69	1,272
1650-59	194	70-79	1,059
60-69	1,800	80-89	1,051
70-79	2,820	90-99	1,026
80-89	2,598	1800-09	955
90-99	2,193	10-19	834
1700-09	2,221	20-29	864
10-19	1,930	30-39	852
20-29	1,700	40-49	659
30-39	1,255	50-56	[440]
40-49	1,103	Raised in proportion of 10 years	628
50-59	1,079		

A glance at this table shows the enormous decrease that has taken place and is still continuing. It will be observed that the decline was rapid in the decade 1730-39, when the change to which I have alluded,—the separation of a distinct class of members,—took place.

To ascertain the proportion of these marriages to the population in which they occurred, we may make each of the two enumerations of the Society the basis of calculation. The first of them gives the marriage rate 0·46 per cent., or about 1 marriage to 216 persons for the 20 years 1830 to 1849. The second for the 13 years, 1841 to 1853, gives 0·42 per cent. or 1 to 236 persons. The average of these two estimates, viz., 1 in 226, is very different from the number for the general population of England and Wales, which for the 18 years 1838 to 1855, was about 1 in 122.†

But this proportion does not fairly represent the whole of the

* For the numbers prior to 1780, I am indebted to the courtesy of Joseph Rowntree, of York. The number in the decade 1830-39, is made up by adding 663, the number registered by the Society from 1830 to middle of 1837, to the Returns of the Registrar-General for 1837-8, 38-9, and half of 39-40.

† 18th Report of the Registrar-General, page ij.

If we examine the ratio of marriages to the number of females living at marriageable ages, the discrepancy between the marriage rate of the Society and that of the general population, becomes greater. 98½ per cent. of the marriages in England and Wales are contracted by females aged 15 and under 50. In the 5 years, 1849 to '53, the annual marriages in England and Wales were 3·33 per cent. of the females living between 15 and 50 at the census of 1851; in the Society of Friends, from 1811 to '53, the annual marriages *according to rule*, were 1·62 per cent. of the females living at the same ages at the middle of the period. The one proportion is more than double the other.

marriages that belong to the Society as a population. When a member contracts a marriage with one not in membership, it can only be done "in a manner contrary to the rules;" such a marriage is not registered by the Society, and the member contracting it, with scarcely any exception, is disowned from membership. These marriages have become very frequent. We have but little means of ascertaining their number, but I place in a note the only data I am acquainted with for forming an approximate idea of it.* It so happens that the two independent data given below, present very similar results. One makes the proportion of persons "marrying "out" 55½, the other 54, to every 100 *persons married* within the Society. In other words, the marriages in which only one party is a member, and for which he or she loses membership, are to the marriages in which both parties are members, as 55 to 50. Assuming this as tolerably correct, let us see what effect the addition of these marriages will make on the marriage-rate of the Society. The marriages "according to rule" being about 1 in 226 of the population, the *persons married* are 1 in 113. But the members marrying "*out*" are to the members marrying "in" as 55 to 100. The fraction $\frac{1}{113}$ must therefore be increased in the proportion of 100 to 155; it then becomes 1 in 73. The corresponding number for the general population of England and Wales is 1 in 61, so that even with this large correction, the rate of marriage amongst Friends is considerably below that of the general public, as might be expected.

* A pamphlet by Joseph Rowntree, of York, circulated, but not published, in the spring of this year, furnishes the following information:—

Out of 851 boys educated at Ackworth during the present century, whose marriages have been ascertained, 547 have married in accordance with our rules, and 304 in opposition to them.

The "monthly meeting" of Brighouse, embraces Leeds, Bradford, Huddersfield, and a large rural district. During the 17½ years from June, 1837, to the end of 1854, the average number of members was 819. In this period 53 marriages occurred between Friends, and were entered in its registry; 53 women and 26 of the 53 men being at the time members of this "monthly meeting." The remaining 27 men were members of other meetings. 34 men, members of this "monthly meeting," married members of other meetings, and were registered elsewhere. Thus the entire number of members of Brighouse "monthly meeting" who married in accordance with our rules, was 113, viz., 60 men and 53 women. In the same period 61 members of Brighouse "monthly meeting," viz., 32 men, 29 women, married in a manner contrary to the rules, and were all disunited. In the first 12½ years, the marriages contrary to rule averaged 3 per annum; in the last 5 years, the yearly average exceeded 4½.

Since this paper was read before the Society, I have been informed by my friend, W. Beck, that in the "monthly meeting" of Devonshire House (one of the large metropolitan districts), the marriages *according to rule* in 50 years, from 1803 to '53, were 166; and that the marriages occasioning disownment were 120. This gives the proportion, 36 marriages *out* of the Society to each 50 within it—a smaller proportion than that given above. But it must be recollected that these data extend to an earlier period of this century, and there is no doubt that marriages out of the Society have very much increased of late years.

IV.—*Births in the Society.*

The following are the Births registered by the Society in England and Wales from its origin to the middle of 1837. It is much to be regretted that we have no return of the births since that date, and consequently are unable to make a trustworthy estimate of the proportion of births to population.

(D.)—*Society of Friends.—Births, from its commencement to* 1837.

Prior to 1660	3,104	1760–69	6,010
1660–69	7,262	70–79	6,586
70–79	9,753	80–89	6,817
80–89	9,211	90–99	6,713
90–99	9,130		
1700–09	9,074		
10–19	8,358		
20–29	7,354		
30–39	6,492		
40–49	5,544		
50–59	5,578		

	Members.	Not Members.
1800–09	4,863	2,047
10–19	4,331	2,294
20–29	3,850	2,540
30–37½	2,922	1,655

V.—*Proportion of the Sexes at Birth.*

Between 1800 and the middle of 1837, 105·7 males were born and registered as members of the Society to 100 females. The excess of males is greater than in the general population of England and Wales, in which for the 18 years 1839-56, it was 104·7 to 100, and in no year exceeded 105·4. It is remarkable that the births, amounting to more than 8,000, of those whose parents were *not members*, were in the proportion of 110·8 males to 100 females. Here the registration was a voluntary act of the parents, and the high proportion, as Dr. Thurnam suggests, is probably due to the greater importance attached to the registration of boys.

VI.—*Proportion of Births to Marriages in the Society.*

The ratio of births to marriages during the four periods from the commencement of the century to 1837, is as follows:—

(E.)—*Ratio of Births to Marriages.*

1800–09	5·09	births to 1 marriage.
1810–19	5·19	ditto.
1820–29	4·45	ditto.
1830–37½	4·40	ditto.

and in the whole 37½ years the proportion is 4·81 to 1. How far do these numbers measure the real "fecundity" or average number of living births resulting from each marriage? They do so very imperfectly, and that for two reasons. In the first place, the births

in any given period are the result of marriages which average from eight to ten years earlier; and if the population be decreasing, those marriages were more numerous than they are in the period during which the births occurred. Consequently the mere comparison of births with the marriages in the same period, gives a quotient which is larger than the actual fecundity. To illustrate this, compare the proportion of births in wedlock to marriages in three separate populations.

(F.)—*Ratio of Births to Marriages as follows:—*

Lancashire, ...	1851–55	3·51	births to 1 marriage.
England and Wales,	,, ...	3·69	ditto.
Wiltshire, ...	,, ...	4·17	ditto.
Society of Friends		4·81	ditto.

Now between 1841 and '51, Lancashire increased very much faster than England and Wales, while Wiltshire did not increase at all; it is evident then, that irrespective of real "fecundity," the greater or less increase of a population will cause this number to be smaller or greater.

But we must not conclude that 4·81 is necessarily an over-estimate of the fecundity in the Society of Friends. It would be so if the decrease took place solely by excess of deaths over births. This is not the case; the decrease of the Society is also the result of secessions during adult life. The separation of members subsequent to marriage, but during the child-bearing ages, while it leaves the number of marriages the same, will diminish the number of births registered in the Society. Perhaps this is the explanation of the ratio being so much less subsequently to 1820, than it was in the first two decades of this century.

VII.—*Deaths in the Society.*

The following are the Deaths of Members of the Society in England and Wales from 1800 to middle of 1837:—

(G.)—*Society of Friends.—Deaths in England and Wales,* 1800-37.

		Annual Average.
1800–09	4,855	485·5
10–19	4,525	452·5
20–29	4,363	436·3
30–37½	3,446	459·4

Unfortunately I possess no returns of the deaths in England and Wales since the middle of 1837 to compare with these. The several numbers of the "Annual Monitor" furnish the following returns of Deaths in the Society in Great Britain and Ireland from the end of September, 1842, to the same time in 1857. They are very

valuable, since they are distributed not only according to sex, but according to age, and thus form correct materials for a life table.

(H.)—*Society of Friends.—Deaths in Great Britain and Ireland, Male and Female,* 1842-1857.

Years.	Males.	Females.	Total.
1842– 3	160	196	356
3– 4	139	203	342
4– 5	165	189	354
5– 6	155	202	357
6– 7	166	232	398
7– 8	164	223	387
8– 9	152	237	389
9–50	131	179	310
50– 1	160	167	327
1– 2	137	225	362
2– 3	131	180	311
3– 4	157	217	374
4– 5	170	187	357
5– 6	123	164	287
6– 7	119	181	300
Sum	2,229	2,982	5,211
Average	148·6	198·8	347·4

Dividing the whole 15 years into three sections, we find the Average of each quinquennial period as follows:*

Years.	Males.	Females.	Total.
1842–47	157	204·4	361·4
47–52	148·8	206·2	355
52–57	140	185·8	325·8

* If we did not know the great care with which these returns have been collected by the editors of the "Annual Monitor" from their numerous correspondents in the several divisions of the country, we might apprehend that they are defective, so much lower are they (although including Ireland and the few Friends in Scotland) than the former returns terminating in 1837. I believe there is a small deficiency from the whole of the deaths of infants not being collected; but am inclined to apprehend more error of excess in the earlier returns, from the following cause. The Society having been accustomed to register other births and deaths than those of members, before the change of the law; the words "not a member" (abbreviated in practice into "n. m.") might easily be omitted from the record. In the Table of Deaths from 1780 to the middle of 1837, prepared for the use of the Friends' Provident Institution, and which gives for the 57½ years

Total Deaths of Members.	Males.	Females.
28,988	13,384	15,604.

I have great reason to think that this error has occurred, and that the numbers are swelled by it.

VIII.—*Ratio of the Sexes at Death, and Ratio of the Living.*

The returns of the Deaths in each decade from 1800 to 1837 do not distinguish the sexes, but the collective return of deaths from 1780 to 1837, made for the use of the Friends' Provident Institution, gives the proportion of 116·5 females to 100 males. Again, the returns given in the last paragraphs for Great Britain and Ireland in the 15 years 1842-57, give a proportion of 133·7 to 100. Although these data are not strictly comparable, yet there is no doubt that the excess of female deaths over male deaths must have increased greatly. Examining the proportions of the sexes in the living, we find—

(I.)—*Ratio of the Sexes in the Living, as follows:—*

		Females living to 100 Males.
Society of Friends, England and Wales	1840	120·3
Ditto ditto	1847	117·6
Ditto *Great Britain and Ireland*	1847	118·0
General Population, England and Wales	1851	104·1

It thus appears that the distribution of the sexes among the Society in Ireland is not very different from that in England and Wales. And in England and Wales we find that the *excess of females*, although much greater than in the general population, is diminishing. While the aggregate of the sexes decreases, the number of females is decreasing in largest ratio. We shall presently meet some considerations which explain this fact,—a fact at first sight contrary to what we might expect, seeing that of the several causes of secession, many, such as emigration, disownment for delinquency or failure in business, must operate much more largely on the male sex than on the female.

IX.—*Proportion of Births to Deaths.*

No satisfactory conclusions can be drawn on this point unless we consider the sexes separately. We have the births and deaths in England and Wales in each decade from 1800 to 1837, and though the distribution according to sex is not given, there will be no great error if we divide them according to the proportions found above. The Table may be constructed thus:—

(K.)—*Society of Friends.—Proportion of Births to Deaths.*

Periods.	Males.			Females.		
	Born.	Died.	Deaths to 100 Births.	Born.	Died.	Deaths to 100 Births.
1800–9	2,499	2,241	89	2,364	2,613	110
1810–9	2,225	2,089	94	2,105	2,436	116
1820–9	1,978	2,014	102	1,871	2,348	125
1830–7½ Raised in proportion of 10 yrs.	2,002	2,121	106	1,894	2,473	130

It will be seen that there has been an invariable increase in the proportion of deaths to births; and that while among Females the deaths have exceeded the births in every decade, this was not the case among Males in the two first decades, but has been so since. This is the simple result of males being in excess in the births, while in the deaths the preponderance is on the other side. It furnishes a law *applicable to all populations decreasing by excess of deaths over births;—that the decrease begins earlier and goes on faster in the female sex than in the male.* Moreover, it explains the fact of the decrease of the Society being so much greater among females, in spite of the causes of separation operating so much more on the male sex.

Unfortunately we have no return of the number of Secessions from the Society, but that, as I have just suggested, they are really more numerous in the male sex, is proved by the following calculation. At the time when the Society was enumerated, June 1847, the Males aged between 40 and 50 must have been, with the small exception of persons admitted into the Society, the survivors of those born between 1797 and 1807. By applying the proportion of sexes at birth and some small degree of interpolation, we are able from the returns previously given to estimate approximately the number of male births between those years. Using, then, the Life Table for the Society of Friends which I give in the sequel, we can ascertain how many, from such a number of births, should be living between the ages of 40 and 50. Finally, a comparison of this result, with the number aged 40 to 50, enumerated 1847, shows *approximately* how many have disappeared by emigration and voluntary or involuntary secession. Applying the same process to the ages 30 to 40, 20 to 30, and 10 to 20, and to each sex, we find that for the youngest of these ages the number enumerated corresponds

nearly with that calculated. For the other ages the loss is considerable, and is much greater among males than among females.

(L.)—*Society of Friends.—Estimate of Loss, otherwise than by Death.*

Sex.	Decades from Midsummer to Midsummer.	Estimated Births.	Number that should be living at the respective ages, June, 1847, according to the Life Table.		Enumerated, 1847.	Loss, per cent. of Calculated Number.
Males	1797–1807	2,584	40–50	1,463	781	46·6
	1807–1817	2,294	30–40	1,417	816	42·4
	1817–1827	2,039	20–30	1,369	1,121	18·1
	1827–1837	1,995	10–20	1,448	1,459	0·0
Females	1797–1807	2,435	40–50	1,343	1,051	21·7
	1807–1817	2,170	30–40	1,340	1,032	23·0
	1817–1827	1,929	20–30	1,320	1,186	10·1
	1827–1837	1,889	10–20	1,406	1,422	0·0

X.—*Ages of the Living.*

The following Table shows the proportion living at each age, of 1,000 at all ages,—the males and females separately; and also in a third column the proportion of females living at each age, out of the number corresponding to 1,000 males. This third column enables us to see the proportion that the sexes bear to one another at any cotemporary age. The Table is for the Society of Friends in Great Britain and Ireland on 30th June, 1847; and I have appended to it, for the sake of comparison, the similar facts for the general population of England and Wales at the census of 1851.

(M.)—*Ages of Living;—Males and Females.*

Age.	Society of Friends.			General Population.		
	1 Males.	2 Females.	3 Females.	1 Males.	2 Females.	3 Females.
0– 4	86·9	74·6	88·1	134·0	128·0	133·4
5– 9	94·2	81·2	95·9	119·6	113·9	118·7
10–14	103·9	84·6	99·8	109·8	103·8	108·1
15–19	104·3	88·1	104·0	99·4	96·6	100·6
20–29	165·4	145·3	171·5	170·2	179·5	187·0
30–39	116·2	126·4	149·2	131·0	132·7	138·2
40–49	110·2	126·7	149·5	98·7	98·4	102·5
50–59	100·4	113·7	134·2	68·4	69·3	72·2
60–69	68·8	86·3	101·8	43·1	47·0	48·9
70–79	38·3	57·9	68·3	20·4	23·6	24·6
80–89	10·6	13·8	16·3	4·8	6·2	6·5
90 and upwards	0·6	1·2	1·4	0·3	0·5	0·5
Sum	1000·0	1000·0	1180·3	1000·0	1000·0	1041·6

This Table may suggest many reflections. It is worth while to remark the much smaller proportion of individuals below 40 in the Society of Friends than in the general population, and that in the extremes of life the difference of distribution is very great. If we compare one sex with another, we observe that while in the general population Males are in excess in each quinquennial period below 15, and that at every age above 15 Females preponderate; in the Society of Friends, females preponderate at every age, except between 10 and 20. What causes this exception it is difficult to say.

XI.—*Mortality at Different Ages.*

The next table that I present gives the mortality per cent. at each age, in the Society of Friends. Above 5 years it is deduced from the deaths in Great Britain and Ireland in 10 years, 1842-52, as returned in the volumes of the "Annual Monitor." With a small correction for decrease during one quarter of a year, the enumeration of members in June, 1847, comes at the middle of this period. On the mortality given for the first year of life and first 5 years, I cannot place quite so much reliance. These are derived from entirely different data, viz., from the return to which I have alluded in a preceding note, of the deaths occurring at each age among members from 1780 to the middle of 1837. A pretty near approximation is made by comparing these deaths in the first years of life, with the average annual births from 1800 to 1819, the middle of which period nearly corresponds with the middle between 1780 and 1837. I have mentioned that I have reason to think this return includes some not members of the Society, so that we may fairly regard the mortality derived from it as rather erring on the side of excess. Yet it is considerably lower than the mortality at the same ages amongst the general population. The mortality under 5 years, derived from the "Annual Monitor" during the 10 years 1842-52, is 3·190 per cent. for males, and 2·383 per cent. for females, which is obviously much too low, indicating that with all their care the editors have not been able to record the whole of the deaths occurring in infancy.

(N.)—*Mortality at Different Ages.*

Ages.	Society of Friends.		Ages.	General Population.	
	Males.	Females.		Males.	Females.
0 and under 1	14·817	10·729	0 and under 1	20·510	15·440
0 ,, 5	5·598	4·733	0 ,, 5	7·072	6·037
5 ,, 10	·556	·681	5 ,, 10	·926	·900
10 ,, 15	·336	·487	10 ,, 15	·504	·548
15 ,, 20	·782	·841	15 ,, 25	·805	·833
20 ,, 30	·881	·911	25 ,, 35	·958	1·009
30 ,, 40	·782	1·141	35 ,, 45	1·249	1·242
40 ,, 50	·994	1·138	45 ,, 55	1·776	1·548
50 ,, 60	1·404	1·677	55 ,, 65	3·141	2·782
60 ,, 70	4·473	3·379	65 ,, 75	6·613	5·885
70 ,, 80	8·583	7·461	75 ,, 85	14·394	13·201
80 ,, 90	17·826	21·618	85 ,, 95	29·646	27·553
90 and upwards	48·065	38·416	95 and upwards	42·697	40·795

Note.—I have annexed the mortalities in the general population of England and Wales for the 7 years, 1838–44, as given in the Ninth Report of the Registrar-General, p. 177. To make the two series strictly comparable, one of them should be interpolated so as to make each decade consist of the same years of life. But even as they stand, calculated directly from the facts without any process of interpolation, the contrast between the two populations is sufficiently striking. At each age under 15, the difference is very great. It should be recollected that these numbers rather *over* state the mortality under 5 years, in the Society.

XII.—*Results of the Life Table.*

From the mortality given in the last paragraph, I have calculated a Life Table. The numbers prior to 5 years of age, are not advanced with much confidence. That any error in them may not vitiate the rest of the Table, I have placed the basis at 5 years. I have calculated the expectation of life, or Mean Future lifetime, and placed in a parallel column the mean future lifetime of the general population of England and Wales, derived from the sixth and twelfth volumes of the Registrar-General's Reports. The materials and mode of construction of the Life Table are given in a later section of this paper.

(O.)—*Life Table.—Society of Friends and General Population.*

Age.	Society of Friends.				General Population of England and Wales.	
	Life Table.		Expectation of Life, or Mean Future Lifetime.		Mean Future Lifetime.	
	Males.	Females.	Males.	Females.	Males.	Females.
0	1305·8	1256·6	45·34	45·72	40·36	42·16
1	1125·6	1128·6	51·54	49·87	46·95	47·55
5	1000·0	1000·0	53·83	52·08	50·21	50·37
10	968·4	961·4	50·53	49·10	47·47	47·81
15	951·4	938·0	46·38	45·25	43·62	44·13
20	916·4	900·7	43·05	42·02	39·99	40·80
25	876·5	860·1	39·90	38·89	36·60	37·51
30	839·5	819·0	36·55	35·71	33·21	34·21
35	806·4	775·6	32·95	32·64	29·82	30·98
40	774·1	733·1	29·22	29·31	26·46	27·72
45	739·6	693·0	25·46	25·86	23·13	24·42
50	704·3	652·4	21·61	22·32	19·87	21·07
55	663·9	606·3	17·77	18·82	16·66	17·62
60	600·0	549·6	14·37	15·49	13·60	14·39
65	502·8	478·3	11·65	12·42	10·90	11·51
70	386·6	393·8	9·38	9·53	8·55	9·01
75	269·2	292·7	7·40	6.93	6·57	6·91
80	164·5	173·3	5·56	4·97	4·97	5·19
85	80·2	71·8	3·89	3·69	3·74	3·85
90	25·2	19·9	2·64	2·80	2·80	2·83
95	3·7	3·4	1·68	1·72	2·11	2·08

If we compare the fourth and fifth columns of the preceding Table with the sixth and seventh respectively, that is, notice the difference subsisting at each age and for each sex, between the mean future lifetime of a "Friend" and that of one of the general population, we shall find the following results.* In the first place, the former is always the larger of the two; and in early childhood the difference between them is very great. Secondly, while in the Male sex this difference continues considerable throughout life, amongst Females it dwindles down almost as soon as infancy is past, and throughout early womanhood and middle life is but slight. In other words, the females of the Society of Friends do not show by any means so much improvement on the general population of their sex, as the males do on theirs. Hence it follows, that while in the general population the mean future lifetime of the female is through-

* These results were made very apparent in a coloured diagram exhibited at the reading of the paper.

out life greater than that of the male; in the Society of Friends it becomes less than that of the male very shortly after birth, and continues less until between 35 and 40. After that age it is greater, and so remains until upwards of 70. This fact,—*the lower relative value of female life*, is a striking and unexpected one. In attempting to account for it, we must bear in mind that, although these conclusions are derived exclusively from the Society of Friends, it by no means follows that they belong exclusively to them. A body living in some luxury, or at any rate comfort, is compared with another body including all classes of society. If we could obtain data from another body in a similar social position, we should certainly find a similar improvement in the value of life, and perhaps we might find the very same phenomenon, a defect in the degree of improvement of the value of life among females.* A very natural explanation of the apparent difficulty is, that the increased value of Male life is so much greater in consequence of their being exempt from the dangers, fatigues, and injuries that beset the life of young and middle aged men among the operative classes. If there were no other objection to this explanation, there is this, which is fatal to it,—that the much greater improvement in male than female life, begins from a very early age,—at least 5 years, when these causes cannot be operating. I confess that I entertain a strong suspicion that the true cause lies in defective female training—not perhaps peculiar to the Society of Friends, but belonging to the upper and middle classes of the social scale. Females during the period of childhood, adolescence, and the early part of middle life, are much more liable than males to be injured by the luxuries and refinements that surround an educated class. If we could obtain reliable facts on the prevalence of consumption in the upper and middle ranks of society, it would throw much light on this important question. This period, between 5 years and 35 or 40, during which the mean future lifetime of females in the Society is less than that of males, is the period during which, as pointed out by Dr. Farr in the recent Report of the Registrar-General, the mortality from consumption in the general population is greater among females than among males. There must be some connection between these facts, and it will be well for them to become generally known, so as to influence those who have the care of female education.

* According to the "Experience Table," the expectation of life of females, from the age of 20 to nearly 40, is below that of males of the same ages. This has been commonly explained by supposing selection *against* the offices. May it not rather be due to the same law in the upper and middle classes of society, which this paper shows to prevail in the Society of Friends?

XIII.—*Comparative Mortality of the Society of Friends and the General Population.*

The mere comparison of the gross mortality of two populations throws very little light on their relative healthiness or vitality. Their different distribution as regards age must be taken into account, and then we can fairly place them side by side. The following table will enable us to do so in this instance. There are three columns for each sex. In the *first* appears the mortality for each age in the Society of Friends as given before. The *second* contains the products of those mortalities with the proportion of the population (Society of Friends) living at the respective ages. These products represent the mortality at each age *out of* 100 *living at all ages;* their sum is the total mortality per cent. which should agree with the percentage found by direct division of the deaths by the number living. The *third* column shows a series of numbers, the product of the mortalities for each age belonging to the Society of Friends, with the distribution belonging to the general population of England and Wales. The sum of these numbers represents the total mortality per cent. that would occur in the Society of Friends if it were distributed according to age as the general population is; or, which is the same thing, that would occur in the general population, if instead of its own laws of mortality, it were subject to those obtaining in the Society of Friends.

The result is, that it would lose annually 18·5 per 1,000 of its males, and 18·5 of its females, whereas from 1838 to '44, it lost annually 22·7 of its males and 21 of its females. It must be recollected that in this computation the mortality in infancy in the Society of Friends is probably over estimated, so that the difference between the mortality of Friends and that of the General Population, is rather greater than these numbers show; nevertheless the improvement, at least on the Male side, is very considerable.

(P.)—*Rate of Mortality—Males and Females.*

Age.	Males.			Females.		
	Mortality of Society of Friends.			Mortality of Society of Friends.		
	Per Cent. of Living at Each Age.	Per Cent. of its Total Population.	Per Cent. of its Total Population, if distributed as General Population.	Per Cent. of Living at Each Age.	Per Cent. of its Total Population.	Per Cent. of its Total Population, if distributed as General Population.
0– 4	5·598	·4865	·7501	4·733	·3531	·6058
5– 9	·556	·0524	·0665	·681	·0553	·0776
10–14	·336	·0349	·0369	·487	·0412	·0505
15–19	·782	·0815	·0777	·841	·0741	·0812
20–29	·881	·1457	·1499	·911	·1324	·1635
30–39	·782	·0909	·1024	1·141	·1442	·1514
40–49	·994	·1095	·0981	1·138	·1442	·1120
50–59	1·404	·1409	·0960	1·677	·1906	·1162
60–69	4·474	·3077	·1930	3·379	·2915	·1588
70–79	8·583	·3286	·1757	7·460	·4318	·1765
80–89	17·826	·1888	·0854	21·618	·2983	·1349
90 & upwds.	48·065	·0279	·0153	38·416	·0453	·0207
All Ages	....	1·995	1·847	....	2·202	1·849

XIV.—*Mean Age at Death and Mean Age of the Living.*

We know that in a theoretical population, in which for a period exceeding the whole duration of life, the deaths have equalled the births, and the numbers been undisturbed by immigration or emigration, there are three elements which are identical;—the mean future lifetime at birth, the average age at death, and the number out of which one dies annually. But no population that we are acquainted with is so situated, and consequently none present these results numerically the same. For the sake of comparison, I will first present these elements as they exist in the *general population* of England and Wales.

England and Wales.	Males.	Females.
Mean Future Lifetime at Birth.....	40·36 years	42·16 years
Average Age at Death (1838-44).....	27·97 ,,	30·35 ,,
Living to one Annual Death, ditto	44·1	47·5

If we make the mean future lifetime of each Sex the unit, we find—

	Males, per cent.	Females, per cent.
Average Age at Death is	30·7 below	28 below.
Living to one Annual Death is.....	9·1 above	12·6 above.

The large and long continued excess of births over deaths, producing a large proportion of young in the population, has depressed the average age at death and raised the number out of which one death occurs. That the first is more depressed in the male sex, and the second more raised in the female, is probably due to the males having been diminished in middle life by emigration and service abroad.

Such is the result in the general population. In the Society of Friends we have a population under very different circumstances. Here the deaths have exceeded the births; this excess has been greater among females; and the population has sustained large losses by secession in early manhood and middle life, which losses have been greater in the male sex. Accordingly the results are very different.

Society of Friends.	Males.	Females.
Mean Future Lifetime at Birth	45·34	45·72
Average Age at Death, 1842-52*	40·9	47·8
Living to one Annual Death, ditto*	50·12	45·41

Referring these as before to the mean future lifetime as the unit, we find—

	Males, per cent.	Females, per cent.
Average Age at Death	9·7 below	4·5 above.
Living to one Annual Death	10·5 above	·6 below.

Had the excess of deaths over births been the only operating cause, we should expect to find the converse of what we saw in the general population, viz., the *first* of these elements *above* the mean future life-time, the *second* of them *below;* and we should expect to see these phenomena more strongly exhibited in the female sex, where the defect of births has been greatest. But the decrease by secessions acts in a contrary manner, and tends to keep the average age at death from rising and the second element from falling, as they would otherwise do. This influence is very strongly marked on the male side, where the secessions have been greatest.

In offering these remarks I do not presume to have explained so intricate a subject, and I bring it forward mainly with the view of furnishing these facts—derived from so peculiar a population,—for the consideration of others. The same object leads me to notice the mean age of the Living. By a column termed Y, for the addition of which to the life table we are indebted to Dr. Farr, we are able to calculate the "mean age of the living" in a theoretical population, stationary as to numbers and undisturbed by migration. The comparison of this *calculated* result with the *actual* mean age, derived from a Census, is an interesting object of inquiry. The following are the numbers for the *general population* of England and Wales:—

	Males.	Females.
Mean Age of Living by English Life Table (No. 2 for Males, No. 1 Females).....	31·99	32·5
Mean Age of Living, 1851	26·0	26·8

Here the population is about 6 years younger than the theoretical age, as might be expected from its rapid increase.

* These numbers are derived from the returns of the "Annual Monitor," after correcting the deaths in infancy, in accordance with the infantile mortality obtained from other data.

For the Society of Friends we have:—

	Males.	Females.
Mean Age of Living, by Life Table	33·58	33·28
Mean Age of Living, 1847	31·04	34·64

In this case, while the males are 2½ years younger than the calculated age, the females, on the contrary, are more than a year older; a result which it would not be easy to anticipate, although probably due to the same causes we have before noticed.*

XV.—*Data and Mode of Construction of Life Table.*

The chief portion of the Table is based on the following materials. Small as they seem, when compared with the elements of a National Life Table, it must be remembered that they are more than twice as extensive as the facts on which the celebrated Carlisle Table was formed.

(Q.)—*Living and Deaths in Society of Friends;—Great Britain and Ireland.*

Ages.	Males.			Females.		
	Living, June 30th, 1847.	Deaths in 10 Years.	Mortality.	Living, June 30th, 1847.	Deaths in 10 Years.	Mortality.
5–10	810	45·	·00556	824	56	·00681
10–15	893	30	·00336	858	41·75	·00488
15–20	896	70	·00782	894	75	·00841
20–30	1,421	125	·00881	1,474	134	·00911
30–40	999	78	·00782	1,282	146	·01141
40–50	947	94	·00994	1,285	146	·01139
50–60	863	121	·01404	1,153	193	·01677
60–70	591	264	·04473	875	295	·03379
70–80	329	282	·08583	587	437	·07461
80–90	91	162	·17826	140	302	·21618
90 and upwds.	5	24	·48065	12	46	·38417

* As the weak point of the Life Table I have used in this paper lies in that portion between birth and 5 years, I have calculated the "mean age of the living" both theoretical and actual, *above 5 years*. They are as follows in the Society of Friends:—

	Males.	Females.
Theoretical Mean Age of Living at and above 5 years	36·68	36·46
Mean Age of Living at and above 5 years, 1847	33·75	37·23

The result is not very different from what is stated above. For the population of England and Wales, the corresponding numbers are,

	Males.	Females.
Theoretical	35·21	35·7
Actual	29·5	30·4

The deaths were for 10 years, from the end of September, 1842, to the same time in 1852, and consequently the middle of the period is 3 months later than the date of the enumeration. The population was decreasing, and for so short an interval as a quarter of a year, there can be no great error in applying to each age the rate of decrease derived from the numbers at all ages between 1840 and and 1847. This correction amounts to adding to the logarithm of the deaths,—

·0005964 for males.
·0009428 for females.

The deaths between 10 and 15 being the smallest number, I have used, for the sake of greater accuracy, five-sixths of the deaths in 12 years, 1841–53.

The mortalities in the next Table are derived from the preceding, by interpolating with three differences, making 2½ years the unit, and carefully preserving the relative distance of the several terms used as data:—

(R.)—*Mortality, Interpolated for every Fifth Year and Logarithms resulting.*

Age.	Interpolated Mortality.		Age.	Logarithms of Probability of Living One Year.	
	Males.	Females.		Males.	Females.
7½	·00556	·00681	7	$\bar{1}$·9975854	$\bar{1}$·9970421
12½	·00336	·00488	12	·9985408	·9978824
17½	·00782	·00841	17	·9966038	·9963489
22½	·00897	·00923	22	·9961044	·9959923
27½	·00861	·00971	27	·9962607	·9957826
32½	·00802	·01095	32	·9965170	·9952413
37½	·00810	·01132	37	·9964822	·9950829
42½	·00918	·01119	42	·9960132	·9951415
47½	·00982	·01198	47	·9957352	·9947915
52½	·01148	·01458	52	·9950143	·9936679
57½	·01985	·01947	57	·9913790	·9915440
62½	·03545	·02778	62	·9846027	·9879346
67½	·05243	·03875	67	·9772297	·9831673
72½	·07234	·05796	72	·9685694	·9748199
77½	·09791	·10346	77	·9574442	·9550277
82½	·14166	·17541	82	·9383747	·9236246
87½	·22798	·25861	87	·9005573	·8870562
92½	·37669	·34376	92	·8344289	·8492094
97½	·60764	·62601	97	·7277038	·7186853

The logarithms given in the last two columns are next interpolated for each year by Mr. Neison's formula, with three differences.

The result is the following Life Table, in which no process of graduation has been employed, and consequently some irregularities exist. Until the appearance of Dr. Farr's paper, about to be read before the Royal Society, I have preferred giving the ungraduated results of calculation to venturing on any artificial method of smoothing them. It is generally acknowledged that the graduation is the defective part of Mr. Milne's Carlisle Table; Mr. Neison's method of altering each term into the average of 5, makes perhaps the least interference with observed facts, but it has the effect, though in slight degree, of increasing the total mortality; Dr. Farr's method, employed many years ago and published in the fifth report of the Registrar-General, assumed a law for the increase of mortality from the termination of childhood to the commencement of old age, and thus concealed the fluctuations in the force of vitality that there is great reason to believe actually take place in the progress of life.

The materials for that part of the Life Table prior to 5 years of age are the following. The results must be regarded as provisional only, until better data can be obtained. They probably err on the side of representing the mortality as too great.

(S.)—*Deaths of Members (so stated) Registered in England and Wales in 57½ Years,* 1780-1837, *and Annual Deaths.*

Age.	Males.		Females.	
	57½ Years.	Annual.	57½ Years.	Annual.
0–1	1,793	31·75	1,260	22·36
1–2	566	10·02	546	9·69
2–3	335	5·93	322	5·71
3–4	224	3·97	242	4·29
4–5	164	2·90	182	3·23

Each of these numbers has to be augmented, (the males by 1·0181, the females by 1·0205), for ages unspecified, before dividing by 57½. The annual births of members in 20 years, 1800-19, were 459·7; if these be divided in the proportion that we have found subsisting between the sexes at birth, they become, males 236·22, females 223·48. It will be found that these numbers give the result in the ensuing Life Table (T), using the corrections given by Dr. Farr in the sixth report of the Registrar-General, for reducing the average between the births and those attaining one year, to the true mean population living in the first year of life.

For the sake of those who are not accustomed to the Life Table, it is necessary to explain that the first column shows the numbers *born*, and completing each year of life, in proportion to 10,000 completing their fifth year. The second column shows the numbers *living*, in a population so constituted, at any age and upwards; it also shows how many years the number of persons in the first

column at any age will live, taken together, or their *united* future life-time. The number in the second column divided by that in the first will therefore give the *Mean* future lifetime at any age, which is the same as what has commonly been called "expectation of life." To give an example:—Out of 13,058 males born, 10,000 complete 5 years and 8,000 live to complete 36 years. In a population so constituted, without any disturbing cause, there would be 257,668 males living at 36 years of age and upwards; the 8,000 males at the age of 36 will live unitedly 257,668 years; and 257,668 divided by 8,000 is the mean future life-time of a male aged 36.

XVI.—*Conclusion.*

I will now sum up, in as few words as possible, the conclusions which appear to me to be established in this paper. It will be observed that I have considered the Society of Friends solely in its aspect as a *population*, confining myself to its vital statistics and leaving untouched the important and deeply interesting subjects of its religious and moral welfare. Moreover, in dealing with its present condition, it has not been my object in any degree to criticize the Society, but to make the phenomena it exhibits serve to illustrate the great science of population. Examined with this view, it presents us an instance of a population with the following characteristics:—

First. That it is undergoing decrease from two proximate causes:—the excess of Secessions over Accessions; and the excess of deaths over births; the former of which causes operates most on the male sex, the latter on the female.

Secondly. That its distribution as regards sex and age differs very much from that of the general population in two important respects:—viz., in the much larger *excess* of females over males; and in the much smaller proportion of individuals existing at the younger ages. In other words, it is an older population with a larger proportion of females.

Thirdly. That even with a large addition for Marriages between members and those not belonging to the Society, it presents a marriage-rate considerably below that of the general population.

Fourthly. That the Fecundity of marriages is *apparently* greater than in the general population; whether it is actually so is a point that must still be left undetermined.

Fifthly. That the death-rate is considerably below that of the general population.

Lastly. That the improved value of life is materially different in the sexes, so that while the expectation of Males throughout life is considerably *greater* than that of the male population of England, that of Females from infancy to middle life is but *slightly greater* than that of the general female population.

(T.)—*Life Table, Society of Friends.*—I. *Males.*

	l_x	Q_x		l_x	Q_x
0	13058	592034	51	6971	145222
1	11256	580211	52	6896	138289
2	10705	569231	53	6817	131432
3	10378	558689	54	6732	124658
4	10160	548420	55	6639	117972
5	10000	538341	56	6536	111384
6	9886	528398	57	6423	104905
7	9806	518552	58	6296	98545
8	9752	508773	59	6156	92319
9	9713	499040			
			60	6000	86241
10	9684	489341	61	5831	80325
11	9659	479670	62	5647	74587
12	9631	470025	63	5450	69038
13	9599	460410	64	5243	63691
14	9560	450830	65	5028	58556
15	9514	441293	66	4805	53640
16	9458	431807	67	4576	48950
17	9393	422381	68	4342	44491
18	9320	413025	69	4105	40268
19	9243	403743			
			70	3866	36282
20	9164	394539	71	3627	32535
21	9084	385415	72	3389	29028
22	9003	376371	73	3152	25757
23	8923	367408	74	2919	22721
24	8843	358525	75	2692	19916
25	8765	349721	76	2469	17335
26	8687	340995	77	2253	14974
27	8612	332345	78	2042	12827
28	8538	323770	79	1840	10886
29	8466	315268			
			80	1645	9143
30	8395	306837	81	1458	7592
31	8327	298476	82	1280	6223
32	8259	290183	83	1110	5028
33	8193	281957	84	951	3997
34	8128	273796	85	802	3121
35	8064	265700	86	665	2388
36	8000	257668	87	540	1805
37	7936	249700	88	430	1340
38	7872	241795	89	334	958
39	7807	233956			
			90	252	665
40	7741	226182	91	185	447
41	7674	218474	92	131	297
42	7606	210834	93	89	186
43	7536	203263	94	58	112
44	7466	195762	95	37	65
45	7396	188331	96	22	36
46	7326	180970	97	12	19
47	7256	173678	98	7	9
48	7185	166458	99	3	4
49	7114	159308			
			100	2	2
50	7043	152229	101	1	1

Life Table, Society of Friends.—II. *Females.*

	l_x	Q_x		l_x	Q_x
0	12566	574515	51	6438	139122
1	11286	562823	52	6350	132728
2	10743	551808	53	6258	126425
3	10422	541226	54	6162	120215
4	10181	530924	55	6063	114102
5	10000	520833	56	5960	108090
6	9867	510900	57	5852	102184
7	9771	501081	58	5740	96388
8	9705	491343	59	5621	90708
9	9655	481663			
			60	5496	85150
10	9614	472029	61	5365	79719
11	9576	462433	62	5228	74422
12	9535	452878	63	5085	69265
13	9489	443366	64	4937	64255
14	9438	433903	65	4783	59395
15	9380	424494	66	4625	54690
16	9316	415145	67	4461	50147
17	9245	405865	68	4291	45771
18	9168	396658	69	4118	41567
19	9088	387530			
			70	3939	37539
20	9007	378482	71	3753	33693
21	8926	369515	72	3561	30036
22	8845	360630	73	3360	26575
23	8763	351826	74	3149	23320
24	8682	343103	75	2927	20282
25	8601	334462	76	2697	17470
26	8520	325901	77	2459	14893
27	8438	317422	78	2217	12555
28	8357	309025	79	1973	10460
29	8274	300709			
			80	1733	8607
30	8190	292477	81	1499	6991
31	8105	284330	82	1278	5603
32	8018	276268	83	1072	4428
33	7931	268293	84	884	3450
34	7843	260406	85	718	2649
35	7756	252606	86	573	2004
36	7669	244893	87	449	1493
37	7583	237267	88	347	1095
38	7498	229726	89	264	789
39	7414	222271			
			90	199	557
40	7331	214899	91	148	384
41	7249	207609	92	107	258
42	7168	200400	93	76	167
43	7089	193271	94	52	103
44	7009	186222	95	34	60
45	6930	179253	96	21	33
46	6851	172362	97	12	17
47	6771	165551	98	6	8
48	6691	158820	99	3	3
49	6609	152170			
			100	1	1
50	6525	145604	101	....	....

On Water Supply to Great Towns: *Its Extent, Cost, Uses, and Abuses.* *By* John Strang, LL.D., *City Chamberlain, Glasgow.*

[Read before Section (F), Economic Science and Statistics, of the British Association for the Advancement of Science, at Leeds, 23rd September, 1858.]

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From the peculiar constitution of man, it need scarcely be stated that Water has necessarily been to him an object of primary importance. From the earliest records and monuments we find, wherever human beings happened to be congregated, that this primary element of their existence became an object of chief attention, and that it was only where this great desideratum was abundant, that masses of mankind were found to exist. It followed, therefore, wherever cities were not established on the banks of pellucid streams, but on the sides of rivers, the purity of which had become inappropriate for domestic uses, that artificial means were adopted to furnish what was requisite for the use and comfort of the inhabitants. Amid the ruins of Eastern grandeur, and the still remaining aqueducts of Rome and other cities of the West, abundant evidences still exist of the anxiety manifested for supplying water for their inmates, and for the embellishment, through monumental fountains, of the cities themselves. In modern times, an abundant and pure supply of water for the great and growing cities of the world, has been a peculiar characteristic of legislation and enterprise; and in our own days, Waterworks upon the most gigantic scale have been completed, are in progress, or are projected, to minister to all the exigencies which advanced civilisation, modern comfort, and increasing luxury may require. Let us endeavour to show, by a few statistical facts, derived from the best and most authentic sources, the present and projected water supply of a few of the leading capitals of the Western world, with the extent and cost of such supply, and with some of the social advantages, and even evils, which have arisen, or may still further arise, from rendering water the too easy agent for the removal of impurities which should be transported otherwise,

and thus converting many once pellucid streams, upon which so many cities are founded, into deleterious and noxious common sewers, detrimental to comfort and hostile to health.

We shall begin with

London,

which is at present supplied with water by ten independent Companies. The chief sources of supply are from the River Thames and the River Lea—five of the companies, with a daily supply of 35,372,782 gallons, being furnished by the former, while two companies, with a daily supply of 41,000,000 of gallons, is furnished by the latter. The remaining three companies, with a supply of 4,653,000 gallons, are taken from the River Ravensbourne and the ponds and chalk wells of Hampstead, Plumstead, and Woolwich. The great power employed for its distribution, is steam applied to pumping, amounting to a nominal power of 7,254 horses. The length of the mains and branches extend to 2,086 miles. The area of subsiding reservoirs extend to 141 acres, and of filter beds to 40 acres. The number of Houses supplied amounts to 328,561, and the gross quantity supplied per day reaches 81,025,842 gallons. The entire cost of the several works in the year 1856 was 7,102,823*l.*, which shows that for every pound expended there is a daily supply of 11·4 gallons.

Few cities have improved their water supply in the course of a few years more than London, both in quantity and quality. In 1850 the whole number of Houses supplied was only 270,581, whereas in 1856 water was furnished to 328,561 of the 340,000 houses which now form the aggregate within the Registrar-General's district; while the daily supply of water for all purposes, which in 1850 was 160 gallons per house, was in 1856 no less than 246 gallons. In 1857 the whole population within the bounds of supply amounted to 2,667,617, which leaves, after deducting one-sixth for trade purposes, 26·3 gallons for every individual. Previous to the passing of the Metropolis Water Act of 1852, considerably more than half of the supply was not filtered, the impurities in suspension being only cleared by subsiding reservoirs. Now, however, an area of no less than 40 acres of filters has been added to these subsiding reservoirs. According to the chemical report of Messrs. Hoffman and Blyth, the waters now supplied to the whole metropolis contained not more than *one-half* of the organic matter which was present in these during the year 1851—a diminution of organic matter which, it appears, is neither due to the influence of the season, nor to any difference in the mode of determining its quality in 1851 and 1856, but solely to the alteration of the localities from which many of the companies derive their present supply, and to the manifest improve-

ment which has taken place, in the collection, filtration, and general management of the supply of the metropolis. It has been stated by the Board of Health Inspectors, that the various Companies have more than complied with the obligations placed upon them by the last Parliamentary Act, and have evinced a most anxious desire to discharge the duties imposed upon them for the public good. The only difficulty experienced in drawing supplies from such rivers as the Thames and Lea, arises from the increased and increasing drainage operations pursued by the towns and villages situated on their banks, which, by discharging therein their polluted sewage, even above the improved sources of supply, threaten, ere long, to contaminate or destroy such an enormous supply of what is yet pure and sanitary, if measures be not immediately adopted, indeed, for the prevention of this growing evil—an evil which, by poisoning all large streams, cannot be remedied without a total abandonment of the whole present system of town drainage, and of turning the sewage to some useful instead of deleterious purpose. This, indeed, is the great problem of the day; for while London at this moment can boast of a water supply fully commensurate with the just demands of its mighty population, it is, at the same time, threatened from the drainage, which its abundant supply of water so greatly facilitates, with a pestilential evil, against which it is the imperative duty of every wellwisher for the comfort and health of the greatest metropolis in the world strenuously to combat.

Let us now turn to the water supply, present and prospective, of the French capital, which, among its other late magnificent embellishments, has not been inattentive to the advantages of an improved supply of water.

Paris

is at present supplied with water from various sources. The maintenance of the waterworks and the expense of distributing the water are paid by the municipality. The sources whence the supply are brought are—1st, From the Canal d'Ourcque, by gravitation, which is 52 metres above the level of the sea, and about 20 metres above the lowest point of Paris. 2ndly, From the River Seine, whence it is pumped by steam-engines, and raised to the varied height of 75·30, 72, and 66·24 metres above the level of the sea, and to 43·30, 40, and 34·24 metres above the lowest levels of Paris. 3rdly, From the artesian well of Grenelle, the basin of which is 90 metres above the level of the sea. 4thly, From the aqueduct of Arceuil, the reservoir of which is 57·39 metres above the level of the sea: and 5thly, From sources to the north, which are at much greater elevation, but which in respect of quantity, furnish but little water. The water d'Ourcque is distributed to all the low or less elevated quarters of the city, or

to about two-thirds of the entire surface of the town; the others supply the higher districts. The total length of the principal conduits is 218,213 metres; the length of the smaller pipeage extends to 190,048, or to a total of 408,254 lineal metres, or about 253·6 English miles. The length of the conduits of the water d'Ourcque extends to 281,525 metres, while all the others are only 126,729 metres. The whole length of the streets of Paris is about 400,000 metres, which is less than the extent of the pipeage; but there are many streets without water, while there are several with a double pipeage. It would require about 30,000 metres of small pipeage to give water to all the streets of the capital. The daily quantity that can be at present sent into Paris is as follows:—

Water d'Ourcque	102,000	metres cube.
„ from Seine	30,000	„
„ from Grenelle	950	„
„ from Arcueil	700	„
„ from Northern sources	200	„
	133,850	

or about 29,417,000 gallons.

The total quantity distributed varies considerably. During the hot weather of last year the consumpt rose to about 120,000 metres cube, viz., from l'Ourcque about 100,000 metres cube, and from other sources 20,000 metres cube. In winter the consumpt diminished much, but never below 70,000 metres cube. The number of houses within the boundaries of the water supply of Paris amount to upwards of 30,000, of which only 9,936 were, in December, 1857, supplied with pipes, showing that scarcely a third of these receive water directly. The population amounts to 1,093,262, and the number of the houses directly supplied with water being only a third of the whole, it follows that not more than 351,081 persons are enjoying the advantages of water within their houses. Assuming that 120,000 metres cube, or 26,350,000 gallons are sent daily into Paris, and that the population amounts to about 1,100,000, it shows that there is a daily supply afforded of about 24 gallons to each individual inhabitant. The quantity, however, actually used for domestic purposes is, comparatively speaking, small. It has been calculated that the average daily quantity furnished to each house into which pipes are introduced into the court is about 1,444 litres, or very nearly 10 gallons for each inhabitant in such houses. But the average quantity of water furnished to the whole city (one-fifth of the surface of which is above the level of the distributing reservoirs of the several sources) amounts only to 750 litres per day to each house, or to $5\frac{1}{8}$ gallons per individual. It appears, in fact, that between the *fontaines monumentales* and the purposes of trade

and police, about three-fourths of the volume of water is consumed, and that little more than one-fourth is used for domestic purposes. It may be here remarked, that the inhabitants of the French capital have not yet made use of water as an agent for carrying off the impurities of their houses into the sewers which debouch in the river, and consequently the Seine has not yet become, like the Thames, a great *cloaca maxima*, but is still pure—an ornament, and not a nuisance to the city. The peculiar character of the present sewerage of Paris is, that nothing but the rain and waste-water of fountains, or other uncontaminated water, go directly to the Seine, the soil, &c., of houses being run into tanks attached to each building, which are cleaned out at certain times, and carried away to La Valette, beyond the bounds of the city.

It may be supposed strange that in such a city as Paris, where there is water in almost every leading street, and where it is given at a very low price to those who wish it, there should be so few proprietors who take it in. The explanation, however, is very simple, and arises from the following causes:—1st, The rich population continue, as formerly, to take the water for domestic purpose from the carriers of water, drawn from fountains, in which the water of the Seine is carefully filtered, and absolutely refuse to drink the water of the Ourcque Canal; while, 2ndly, The poor population avails itself of the 2,000 *bornes fontaines*, or pipes opening in the streets close to the kerb-stone, and of the 69 public fountains scattered throughout the city, whence any quantity of water required may be drawn, free of any cost. It appears that the market fountains, the State and the municipal establishments, consume about 13,000 metres cube; the remainder, or 77,000 metres cube, is expended on the streets and roads, through the *bornes fontaines* and the 69 drawing and 33 monumental fountains, and, lastly, on the Bois de Boulogne, where alone there are not less than 16,000 metres cube expended. In throwing so large a volume of water along the public thoroughfares, and in permitting the drawing of supplies from so many openings, the municipality has not succeeded in the end which they proposed to attain. If these public openings were suppressed the proprietors of houses would each and all be forced to become recipients of water from the city, enabling their tenants thereby to draw water in the courts instead of seeking it in the street, while the streets would be freed from two running gutters which line each of the foot pavements. Up to this moment all the water introduced into houses is drawn from stop-cocks placed in the courts, the proprietors having obstinately refused to distribute it throughout the interior of their property, fearing, as they say, the accidents which might arise from the negligence of their tenants. What the present cost of the water supply of Paris has been, it is difficult to say. Certain of the works have existed for

250 years, while the Canal d'Ourcque, which affords the greatest supply, was formed for navigation purposes, for which it is still chiefly used. According to the valuation of M. Belgran, the chief engineer of the present and projected works, we may assume the cost of the existing works at about 20 millions of francs, or 800,000*l.* sterling; and taking the daily quantity of water that is sent into Paris to be 26,350,000 gallons, it follows that for every pound expended there is provided a daily supply of about 33 gallons. To meet the interest of this cost and annual expenditure there is no special tax or forced rate, proprietors being free to take or not as they please the water of the city; but those who take it into their houses pay a very small annual charge. The gross receipts from water paid annually to the municipality in 1857 was only 1,276,550 francs, while there was received from the fountains where the filtered water of the Seine is sold 390,400 francs, or a total of 1,666,950 francs, or 66,680*l.* sterling.

Such is the present state of the Water Supply of Paris; but it is now resolved to alter the whole system, and to bring in a purer and greater supply from the sources of the *Somme-Soude*, by gravitation. Considering that the water is to be brought by aqueducts and conduits from a point between Epernay and Chalons-sur-Marne, in Champagne, a distance of nearly 124 miles, it will not be denied that the project is a bold one, and can only be attained at a vast cost; but under the present energetic Government nothing seems too mighty to be accomplished. The point of departure at the source is 104 metres above the level of the sea; the point of arrival at Paris being 83·50 metres. The size of the circular conduit will be 2 metres in diameter, the length 200 kilometres, and the fall 0·10 per kilometre. The water, to the extent of about 20 millions of gallons per day, on approaching the capital, will flow into the reservoir of Belleville, situated about 200 metres beyond the barrier of Panton. This reservoir will fill two others, that of Montrouge, situated on the south side of the city, at 80 metres above the level of the sea, and also beyond the barrier, and that of Passy, which is situated on the north-west of the city, at 75 metres above the level of the sea. These three reservoirs will contain together 240,000 cubic metres of water (about 53 millions of gallons), or about 2½ days' supply. The cost of each reservoir will average 1,600,000 francs. The main and small pipeage will be placed in open tunnels for sewerage where these exist, and where they do not they will be laid in the ground. The most elevated positions of Paris, but which occupy a small extent of the city, are 60 to 64 metres, above the level of the sea; the height, however, of the chief portion does not exceed 40 metres; while the greatest height of the houses is 17·50 metres. The water will consequently easily reach the higher flats of the greater part of Paris,

and the lower flat of every house even in its most elevated parts. The contemplated cost of the undertaking, including the expense of the aqueduct, collecting the water, the indemnity to landowners and works, is estimated by the engineer at 26 millions of francs, but the Grand Council of Roads and Bridges have put down the expense at 30 millions, to which the expense of distributing reservoirs and mains, amounting to 17 millions, must be added, making the whole contemplated cost 47 millions of francs, or 1,880,000*l.* sterling. It is proposed that the present pipeage, which is in a very perfect state, should be made use of, and that the water from the Canal d'Ourcque should be reserved for public purposes, but not distributed in greater quantities than at present. It is also proposed that, in order to make use of the 100,000 metres cube easily obtained from this source, additional sewers should be constructed throughout Paris, the half of the streets being only at present furnished with these, which will create an additional expense of 43 millions of francs, or a total cost of 90 millions of francs, or 3,600,000*l.* sterling, for the complete sanitary improvement of Paris. The question necessarily arises how the interest of this large outlay is to be met, and the answer is, by a rate from those taking the water. This, it is apparent, will be considerable, for if we add to the 9,936 proprietors who already pay, the rates paid by public establishments, it will be found that the total number of those taking water from the city is 10,115, which produce, as already stated, 1,276,550 francs; if these receipts be added to the tariff of the water of the Seine, which is very moderate, they will produce at least 2,300,000 francs, which shows the average sum for each ratepayer to be 227 francs, or say 230 francs; and if the 30,000 houses of Paris take the water at this price, the total gross receipts will be 6,900,000 francs, and, deducting therefrom the present receipt of 1,700,000 francs, shows a receipt for the new supply of 5,200,000 francs, which represents about 11 per cent. on the capital (47 millions) employed. It is very probable that every house in Paris will take the new water at a price even higher than that of the filtered water of the Seine. Indeed the rich population will no longer have any objection to urge against the new supply, which will be distributed fresh and clear, and which will be even more agreeable to drink than the filtered water of the Seine. The proprietors also of workmen's houses will be induced to take the water in consequence of—1st, The proposed gradual suspension of all the public fountains, which form a real obstacle to the circulation of the city; 2ndly, By removing the side cocks on the streets, and placing them under the pavements, where the drawing of water would be impracticable for domestic purposes, and which would be likewise more convenient for pedestrians; and 3rdly, By permitting all the ratepayers the liberty

of running their soiled water into the public sewers, which is now collected in tanks attached to each house, and which are emptied at a cost of eight francs per cube metre. The liberty of doing so should, however, only be granted when the proposed great lineal sewers on each side of the Seine are formed to carry off the sewerage of the capital to the country, which will maintain as heretofore the purity and the salubrity of the Seine.

As yet Paris, as we have seen, has not been permitted to make use of the easy agency of water to carry off its impurities into an adjacent river, which has proved such a nuisance and growing difficulty to other large towns; and it is to be hoped, for the best interests of that beautiful capital, that every precaution may be taken, when a more abundant supply tends to induce such a use, to prevent an evil similar to that now experienced in many of our British cities.

Turning from the capitals of England and France to the commercial capital of Germany, we find that

Hamburg

is supplied with water by pumping, and has an average daily supply of 5 Millions of gallons. The population within the bounds of supply is 160,000, which shows a daily supply of 31¼ gallons for each inhabitant. The works and distribution are under the charge of the municipality, and the gross cost of them was 170,000*l.*, which gives about 29½ gallons daily for every pound expended. The number of baths and water closets supplied with water amounts to about 6,000. The annual expenditure is paid by the following rates:—1st, For domestic purposes, 2*s.* 6*d.* for every habitable room, kitchen, water closet, or bath within the premises; 2ndly, For every 1,000 gallons used for trading or manufacturing purposes, 6*d.* The soil of the city is collected by a system of sewers, which are discharged considerably below the city, and at ebb-tide.

Leaving Europe, let us next look to the commercial capital of America,

New York,

which is supplied with water from the Croton river, about 40 miles distant, and is brought to the city by aqueducts, upon the principle of gravitation. At the farther point a reservoir has been constructed, the area of which is at least 400 acres, and is capable of containing 500 millions of gallons. From this there is an aqueduct built of stone and brick, 8 feet 5 inches high, and at the bottom 6 feet 7 inches wide, which conveys the water till it reaches the Haarlem river, which is crossed by a stone bridge 1,450 feet long and 114 feet above the tidal flow. From this it is conveyed to a receiving reservoir,

capable of containing 15 millions of gallons, and then to a distributing reservoir, which supplies the city. This undertaking was begun in 1835, by the municipality of New York, and finished at a cost, for the aqueducts alone, and exclusive of the pipe distribution through the town, of about 9 millions of dollars, or 1,800,000*l.* sterling. The pipeage for the supply and distribution of the Croton water from its introduction till the close of 1856 extended to 254 miles 4,490 feet.

In 1849 it only extended to 193 miles, showing an increase in seven years of 61 miles. The pipes employed are from 4 to 48 inches in diameter, viz. :—

48 inches	4,087 feet.	12 inches	275,615 feet.
36 „	60,878 „	10 „	5,875 „
30 „	44,862 „	6 „	899,449 „
24 „	5,400 „	4 „	9,472 „
20 „	31,865 „		
16 „	14,083 „	Total	1,354,616

The number of separate dwellings supplied during the year 1857 amounted to 57,458, and the gross quantity supplied per day was 28 millions of gallons. The whole population furnished with water within the boundaries of supply was last year 713,000, which shows nearly 40 gallons per day for each inhabitant; but deducting a sixth for manufactories, leaves for domestic and public purposes, and waste, 32½ gallons for each individual. The number of private shower and plunge baths in New York in 1857 was about 18,813, and the number of water closets, public and private, amounted to 40,209, showing that there existed a bath for every 38 persons, and a water-closet for every 17 persons within the range of supply. Taking the gross cost of the aqueduct works, which amounted to 1,800,000*l.*, and the daily supply at 28 millions of gallons, it follows that for every pound sterling expended there is a daily supply of 15·5 gallons. To meet the interest of the original cost and the annual expense of these waterworks, a compulsory rate, amounting to about 5 per cent., is raised from every building standing upon a street in which a pipe is laid, whether the water be introduced into the house or not; but this rate, from the great fall in fire insurance which has followed the introduction of the Croton water, is little felt, or at least not complained of. The yearly revenue derived from the Croton water during the year of its first introduction was only 84,444 dollars, whereas in 1856 it amounted to 662,949 dollars. The regular rate is from 4 to 100 dollars for each dwelling, but extra charge is made on houses having more than 15 persons residing therein. From this source about two-thirds of the revenue is derived; the other third is raised from manufactories, horses, hotels, refectories, saloons, slaughter-houses, steam-engines, steam-boats, shipping, water-closets, &c.

Perhaps there is no city in the world where in so short a period such an increased consumpt of water has been experienced as in New York. At the first introduction of the Croton stream, it was thought that from this source there would always have been got a sufficient supply to meet every future demand, arising either from an increase of population or of use. But already it appears there is little water to spare, and complaints are also making that the water does not rise in different localities sufficiently high to supply customers who have paid for its use. The cause of this unexpected position of matters arises, not from a want of water to meet all the domestic and other legitimate demands of the inhabitants—for out of the 28 millions of gallons furnished, only 7,500,000 are used in dwelling houses, and 4,500,000 in manufactories—but from the extraordinary waste which has resulted from the first over-abundant supply—a waste which, here as in other cities similarly situated, has begun to be seriously felt, but which it is difficult to control. The truth is, that water has become the easy agent for the removal of much that was formerly and should still be carried away by other means. In consequence of this great waste, it has been already gravely proposed by the Croton Board not to supply elevated buildings and upper storeys of houses with water, believing that here lie the chief sources of excessive consumption and enormous waste, and that the unnecessary consumption in families, hotels, and boarding-houses would not be one-tenth of that which is now committed in those buildings if the policy had been settled at the commencement of the system that service-pipes should not be allowed in such premises above the first storey. It is also stated that the New City Reservoir, about to be commenced, would not have been considered necessary, at so early a period in the history of the waterworks, for the protection of human life and the support of all the great interests of the city, had care been at first taken to prevent this abuse. The only other remedy suggested to diminish this wasteful consumption is the water-meter, and already several of the large establishments are furnished with these measures, and the system it is thought may be in time extended to dwelling houses. In short, with all the supposed endless supply of the Croton Waterworks, the Aqueduct Board, in a late reply to a demand made upon them by the Street Commissioners for the free use of the Croton water, for the purpose of thoroughly cleansing the gutters every night, peremptorily refuses to accede to it, on the ground that sewers are not intended for carrying off the surface filth or deposit, while the expense to the public for thus carrying off what should be carted away would be twenty times as costly as the mere throwing of it into carts from the pavement; and secondly, and chiefly, as they state in their last report, "that "already the energies of this department are taxed to the utmost to

" keep up a sufficient head in the reservoir to preserve the city from " fire and to answer the legitimate demand of the inhabitants. It is " indisputable that we have not a gallon of water for any other " purpose than the present to spare!"

If London, Paris, Hamburg, and New York have not been inattentive to obtain a plentiful supply of pure water, it may also be stated that a number of the larger provincial cities and towns of England and Scotland have wisely followed their example. The great waterworks of Manchester, Liverpool, Birmingham, Leeds, Carlisle, &c., fully attest what has been done in the southern portion of the island, while the works of Edinburgh, Aberdeen, Greenock, Paisley, Dundee, and the gigantic undertaking now fast progressing at Glasgow, testify to what has been done and is still doing in the north. With respect to the important English provincial undertakings just mentioned, we shall only allude shortly to those of Manchester, Liverpool, and Leeds. Until very lately

Manchester

may be said to have been ill-supplied with the first element of life. The waterworks, however, designed and executed by Mr. J. F. Bateman, which are now nearly completed, have placed that city in the best possible condition. The water, which is soft and pure, is drawn from a considerable distance, and is brought to the city by gravitation. The management of the works and the distribution of the water is in the hands of the City Corporation. The total daily supply for all purposes is at present about 11 millions of gallons, and the population within the bounds of supply being a little over 500,000, shows about 22 gallons a-day for each inhabitant. The separate dwellings, which are nearly all supplied, are about 100,000. The gross cost of the works is about 1,300,000*l.*, including the purchase of the old company; and when the works are fully completed it is calculated that they will furnish a daily supply of 25 millions of gallons, which shows that for every pound expended there will be a daily supply of nearly 20 gallons. The present supply shows only 8·5 gallons for each pound expended. From the as yet limited number of baths and water closets, the consumpt of water for domestic purposes is comparatively small, while there is a proportionally larger quantity used for trade purposes than in other towns. The supply of water by the Manchester Corporation is of three kinds—1st, That for domestic purposes within the city, for which a compulsory rate is levied; 2ndly, The supply to adjoining districts, in a manner similar to a private company, and for purposes of trade within the city; and 3rdly, The supply to other burghs, &c., such as Salford, where the distribution of water and the collection of the rates are in their own hands.

The supply of water for

Liverpool

is brought from several sources, and is under the charge of the corporation. The average daily supply is 11 millions of gallons, and the population within the bounds of supply, including sailors, being estimated at 500,000, shows 22 gallons for each inhabitant. Of the 11 millions of gallons furnished, it is calculated that 65 per cent. is used for domestic purposes, 27 per cent. for trade, and 10 per cent. for public purposes. There are about 72,000 separate dwellings supplied. The number of baths and water-closets is not exactly known, but the estimate of these has been stated at 6,000. The whole cost of the undertaking, including claims yet outstanding, amounts to 1,610,000*l.*, which shows that for every pound expended there is a daily supply of 7 gallons. As in many other towns, the waste of water in Liverpool is considerable. One of the causes of the waste arises from the introduction of water-closets into cottages. It is not, however, a general practice to wash away ashes and filth of that character through the water-closets or drains, nor by the public sewers. In all cases where property is drained, a branch is carried to the ash-pit, and thus much that is in other towns, where an abundant supply of water prevails, carried into rivers, is carted away.

The chief water supply for the town of

Leeds

is brought from Arthington, about 10 miles distant, where it is pumped into a reservoir, from which it is distributed to the inhabitants. The works and distribution are under the management of the Corporation. The average daily supply at present is about 1,850,000 gallons. The number of separate dwellings supplied in March last was 32,312, the population supplied being about 153,000, or at the rate of 12 gallons per day for each inhabitant. As there is no separate rate for baths, it is impossible to say how many may exist in Leeds, but a few months ago there were 1,061 water-closets. The whole cost of the works up to September, 1857, was 283,871*l.* 2*s.*, which shows that for every pound expended there is a daily supply of about 7 gallons. The receipts for the year 1857 were 17,467*l.*; the expenses, including interest on mortgages, 14,638*l.* There is no compulsory rate in Leeds, the taking or not of water being voluntary. The charge for an unlimited supply to a cottage of 5*l.* a year rent is scarcely more than one penny per week, and to a house under 30*l.* sixpence per week.

With respect to the cities and towns situated in the northern portion of the island, we shall shortly allude to the waterworks of

Edinburgh, Aberdeen, Dundee, Greenock, and Paisley, and conclude with a short account of the present and prospective works at Glasgow.

The supply of water to

Edinburgh

is drawn exclusively from the Pentland Hills and the slopes on the east and north sides, and is brought to the city in four large main pipes by gravitation, and is under the charge of a private company. The average daily supply may be taken at 4,800,000 gallons. The delivery has been as high as 5,760,000, but the drought of the last summer has been so long continued, that for several months past it has been a trifle under 4 millions of gallons. The population within the bounds of supply may be taken at 215,000. A large portion of that number, probably between a third and a fourth, are supplied either from private sources or from the public wells. The persons supplied by payment, do not exceed 160,000. Taking, however, the number of persons within the bounds of supply and the supply itself, we find that there are about 22 gallons for each inhabitant. The gross cost of the undertaking is 456,000*l.*, which shows 10⅓ gallons for every pound expended. The number of baths and water-closets supplied is not known, as no specified charge is made for these, but they are very numerous. The waste of water from carelessness and abuse is very great, not less than a third of the whole supply being, as is stated, in many instances worse than uselessly wasted. At the present moment, the company is engaged in bringing in an additional supply, which will add, in November next, about 2 millions of gallons to the daily delivery, and which will make the daily supply about 7 millions of gallons, or a daily supply to each inhabitant of 32½ gallons. There are few cities where the consumption of water has increased in a greater ratio to the inhabitants than in Edinburgh; and it is stated, that if the consumption continues to increase as it has done during the last ten years, a similar difficulty will be felt there as elsewhere to meet this perhaps uncalled-for demand.

Aberdeen

draws its supply of water from the river Dee, by pumping. The average daily supply is about 1,200,000 gallons, and the population within the limits of supply being about 65,000, gives 18⅓ gallons for each inhabitant. The whole cost of the works since their commencement in 1830, has been 50,000*l.*, which shows a daily supply of 24 gallons for every pound expended. The revenue raised for payment of management, interest, and expenses connected with these

works, is chiefly by a rate of 9*d.* per pound on dwelling-houses, and 6*d.* per pound on shops, &c., an additional charge being made of 6*d.* per pound when water is supplied within the premises. The water supply is under the management of the Police Commissioners.

Dundee

is supplied with water from Monikie, about 10 miles distant, by gravitation. The average daily supply is 1,750,000 gallons, and the population supplied is estimated at 96,000, which gives about 18 gallons for each inhabitant. The waterworks are in the hands of a joint stock company, which has expended on them 139,000*l.*, which shows a daily supply of upwards of 12½ gallons for every pound expended. The scale of charges is 1*s.* 2*d.* per pound on dwelling-houses above 6*l.* of rent, while the lowest rate, on houses of 2*l.* rent, is 4*s.* 6*d.* per annum.

Greenock

is supplied by the Shaws Water Company and the Corporation, by gravitation. The average daily supply is, by

Shaws Water Company.....	1,850,000 gallons.
Corporation	262,500 „
	2,112,500 „

and the population within the limits of supply being 40,000, gives nearly 53 gallons for each inhabitant. The gross cost of the works was about 50,000*l.*, but this sum includes the power of supplying mills, sugar-houses, &c. Assuming, however, this as the cost, it shows that for every pound expended there is a daily supply of 42 gallons. The annual expense is paid by a rate of 1*s.* per pound on the rental of all houses using the water supplied by the Shaws Water Company, and of a small additional rating on the part of the Corporation for the water furnished by them through the public wells. The houses of the poorer class, say of 5*l.* and under, are supplied by the Corporation, all others who have water inside are supplied by the Company. The poorer class may, therefore, be held as taxed at 6*d.* in the pound, and the better classes at 1*s.* for water supply, which is abundant.

Paisley

is supplied with water by gravitation. The average daily supply is 1,021,452 gallons, and the population within the bounds of supply being 48,450, gives 21 gallons for each inhabitant. The gross cost of the undertaking was 60,000*l.*, which shows that for every pound expended there is a daily supply of 17 gallons. The works are in the

hands of the Corporation, and the annual expenditure on them is raised by a domestic rate of 1*s.* 3*d.* per pound on all lodgings, by a public rate of 3*d.* per pound on every description of property, by a special rate for horses, cows, warehouses, &c., and by a meter rate for trade purposes. The whole revenue last year was 5,708*l.* 15*s.*

Previous to the year 1806

Glasgow

was but indifferently provided with water. At that time it depended wholly for its domestic supply on twenty-nine public and a few private draw wells, and on the produce of a suburban spring, which was carted to the city and sold from door to door. About that period a water company was formed, to draw water from the Clyde, and to distribute it through the town; and in a few years thereafter a competing company was established for the same purpose, which in the course of time united, and the amalgamated companies continued to monopolise the whole supply till the establishment, in 1846, of another company, limited to supply the south side of the city, on gravitation principles. For some time the two original companies did their best to meet the growing demands of a growing city; and it will not be denied that, while they succeeded in furnishing quantity, the quality was seriously complained of, while the latter company had only a limited supply to offer, and that confined to scarcely a fourth part of the city. To obviate this state of things, the larger company attempted frequently to obtain powers to draw their supply from a purer source; but being unsuccessful in their endeavours, it was at last determined that the works of both companies should be handed over to the municipality by a parliamentary Act, which at the same time contained powers to that body to bring a pure and abundant supply of the primary necessity of life from Loch Katrine, and which when completed will be one of the best and mightiest hydraulic undertakings in the world.

At present Glasgow is supplied, as we have hinted, from two sources—from the river Clyde by pumping, and from streams collected into reservoirs, on the south side of the city, by gravitation, the nominal power used in pumping being 1,000 horses. The highest houses in the city, which may be stated at 275 feet above the level of the river, are all supplied. The length of pipeage in use for its distribution exceeds 130 miles, exclusive of those places where two sets of pipes yet remain, the result of competing companies. The daily supply within the last two years has ranged from 16,119,000 to 17,301,000 gallons, and the population within the boundaries of supply may be reckoned at 420,000, thus showing a gross daily supply for each inhabitant of 40 gallons; or, deducting one-sixth for trade purposes, leaves, including waste, &c., no less than 33 gallons

for each consumer. During the last 18 years the increase of supply and use of water on the part of the inhabitants has been prodigious, the whole quantity distributed in 1830 being 4,500,000 gallons daily for a population of about 200,000, while at the present day it exceeds 17 millions of gallons per day for a population of 420,000, or twice the quantity per head in less than twenty years. To account in some measure for this great and growing use of water in Glasgow, it may be stated that in 1852, from a careful survey then made, there existed within the boundaries of the city no fewer than 6,138 private plunge and shower baths, and 12,144 water-closets; and as the number of separate dwellings have since that period increased to the extent of at least 10,000, coupled with an increasing demand on the part of householders for these conveniences, it will not be too much to say that Glasgow cannot have less than 8,000 of the former and 16,000 of the latter. The use, indeed, of these luxuries is not confined to the rich and middle classes, but extends even to the houses of the working man whose annual rent is only 5*l.* 5*s.*; and the consequence is that a vast and increasing consumpt of water has taken place, arising, it is to be feared, in too many instances from utter carelessness and waste. The cost of the waterworks at present supplying Glasgow, on the 28th May, 1858, was 651,199*l.*, which shows that for every pound sterling expended there is a daily supply of about 26 gallons. The revenue, which is derived chiefly from a rate, amounted last year to 71,413*l.* The expenditure, including interest on capital, but exclusive of the new works connected with the Loch Katrine supply, amounted to 66,566*l.*

Such is the supply and cost of the existing waterworks of Glasgow, which, although abundant and large, have not deterred its citizens from drawing their future supply of water from a distant and purer source, and upon principles which will not only free them from the expense of pumping, but will at the same time afford a supply to the highest house in the city. The idea of supplying Glasgow from the waters of a Highland lake, free of all contamination, 37 miles distant, was first broached in 1848; but it was reserved for the genius of Mr. J. F. Bateman, the engineer of the Manchester Waterworks, to put the idea into execution. Amid surrounding mountains of micaceous schist, subjected to a great rainfall, and isolated from all population, he found ready prepared a great natural reservoir, almost free of cost, and without danger. The superficial area of this reservoir extends to 114,940,000 square feet, and has a catchment basin of more than 35 square miles, to receive an annual rainfall of about 65 inches, and where the evaporation is so small a minimum product of 60 inches. By slightly raising the exit of Loch Katrine, and with a power of draining down the surface to three feet under its ordinary level, a reserve of 5,028

millions of gallons are obtained, which secures a service of 20 millions of gallons per day for 250 days of drought. The water is to be conveyed by mined tunnels, built tunnels, aqueducts, and pipes. The service reservoir is to be placed about six miles from Glasgow; and from the reservoir the water is to be conveyed by two lines of pipes, 36 inches in diameter. The surface of Loch Katrine is 360 feet above the level of the sea. The mean level of the ground on which the greater part of Glasgow is built is under 50 feet of that level. The average height of the houses may be taken at 50 feet. The extreme height of the ground at various points within the range of the distribution of water is 225 feet above high water, making the extreme height at which the water has to be delivered 275 feet above the level of the sea. The tunnels and conduits for conducting the water from Loch Katrine to Glasgow are capable of carrying 40 millions of gallons a day, but the pipes are at present only laid for 20 millions; but when more water is required the addition of the pipeage portion only will require to be doubled. The cost of these new works is estimated at about 700,000*l.*, and, limiting the supply to 20 millions of gallons, shows that for every pound sterling expended there will be a daily supply of 28½ gallons. As these works are now fast progressing, it is almost certain that the whole will be completed early in 1860. When that occurs the daily water supply will be as follows:—

From the Clyde	13,000,000
„ Gorbals	4,000,000
„ Loch Katrine	20,000,000
In all	37,000,000

but dispensing, as is proposed, with the Clyde supply, and thus getting rid of the expense of pumping, there will still remain 24 millions of gallons per day, with a power of increasing it by gravitation to 44 millions. With such a mighty store, it seems almost absurd to suppose that under any circumstances the supply should not be able to meet the demand; but when we recollect the wonderful increase of population which has taken place in Glasgow since the commencement of the century—an increase from 70,000 to 420,000—and the still more wonderful increase in the ratio of the consumption to the population, we do not think it at all improbable that Glasgow may feel ere many years, as New York does now, that she has not a gallon to spare.

Such is the amount of the Water Supply, and its cost, for the several Cities and Towns we have mentioned, and which we now place in a tabulated form for reference:—

WATER SUPPLY *to* GREAT TOWNS *as under.*—SUMMARY *of* RESULTS.

Towns.	Population within Bounds of Supply.	Daily Supply.	Daily Supply for each Inhabitant.	Cost of Undertaking.	Daily Supply for every £ Expended.	Prospective Supply Daily in Addition.
		Gallons.	Gallons.	£	Gallons.	Gallons.
London	2,666,917	81,025,842	30·3	7,102,823	11·4	....
Paris	1,100,000	26,350,000	24·	800,000*	33·	20,000,000
Hamburg	160,000	5,000,000	31·25	170,000	29·50	....
New York	713,000	28,000,000	39·27	1,800,000	15·5	....
Manchester	500,000	11,000,000	22·	1,300,000	8·5	14,000,000
Liverpool	500,000	11,000,000	22·	1,640,000	7·	....
Leeds	153,000	1,850,000	12·	283,871	7·	....
Edinburgh	215,000	4,800,000	22·3	456,000	10·5	2,000,000
Aberdeen	65,000	1,200,000	18·4	50,000	24·	....
Dundee	96,000	1,750,000	18·2	139,000	12·5	....
Greenock	40,000	2,112,500	52·8	90,000	23·4	....
Paisley	48,450	1,021,452	21·	60,000	17·	....
Glasgow	420,000	16,710,000	39·8	651,199	26·	20,000,000

* Independent of the cost of Canal de l'Ourcque.

And now, in conclusion, let me state that, from the statistical figures just given connected with the water supply to great towns, the following results may be drawn:—

1st. The fact of a present prevailing anxiety for an abundant and pure supply of water, irrespective of every difficulty, and at any cost.

2nd. The fact of a growing consumption of water on the part of those who have had it at command, and the necessity of limiting as far as possible the quantity allowed to run to waste.

3rd. That while the increasing abundance of water has necessarily added to the comfort and health of the people, by enabling them to have baths and other conveniences easily and cheaply, it has at the same time tended to encourage city and house impurities being improperly carried away, and that too in a manner calculated rather to *transfer* than to abolish nuisance.

4th. That an abundance of water brought within every house, without due attention being paid to the carrying off to a distance or otherwise separating the solid sewage from the water before it falls into any stream, *is a serious and growing evil*, which ought to be forthwith remedied, particularly on the part of those towns and villages which line rivers from which other towns are deriving their supply of water; and,

5th. That an abundant supply of water is, in short, a limited benefit, except provision be at the same time made for a perfect and profitable riddance of the increased sewage which it invariably creates.

Report *of the Proceedings of the* Second Annual Meeting *of the* National Association *for the Promotion of* Social Science, *held at Liverpool, in October*, 1858. *By* William Tayler, Esq., F.S.S.

[Read before the Statistical Society of London, 16th November, 1858.]

Having had the honour of attending, as representative of the Statistical Society of London, in conjunction with Mr. Danson of Liverpool, also a Fellow of the Society, the Second Meeting of the National Association for the Promotion of Social Science, held at Liverpool in October, 1858, I have now the gratification of presenting a short resumé of the interesting proceedings which took place upon the occasion of that great assembly.

I may perhaps be permitted to observe, as a preliminary to the statement which I have to make of the proceedings, that if the brilliant inauguration in 1857 of that distinguished and rapidly-increasing Society, so ably and graphically described by one of the Members of our Council, was successful, the meeting of the present year may be confidently regarded as having been completely and eminently satisfactory.

The meeting, which in all comprised nearly 2,000 persons, was not only attended by many noblemen and gentlemen whose names have been long prominent in the cause of philanthropy and science, and whose works are an ornament to their country, but also by delegates from all parts of the kingdom, who, with the members and associates then present, gave their united energies to the great objects of the advancement of education, the promotion and repression of crime, the reformation of criminals, the adoption of sanitary regulations, the promotion of statistical knowledge, and the diffusion of sound principles on all questions of social economy.

In addition to the honoured names in the cause of usefulness and public good, of Lord Brougham, Lord John Russell, and the Earls of Carlisle and Shaftesbury, who acted as Presidents of Departments, and whose lucid addresses on the subjects of jurisprudence and amendment of the law, education, punishment, and reformation of crime, public health, social economy and the improvement and benefit of the working classes, will long be remembered by those who had the opportunity of being present: the meeting also counted a very large attendance of distinguished persons, among whom were Lord Sandon, Sir John Pakington, the Right Hon. W. F. Cowper, Sir James Stephen, William Brown, Esq., M.P. (so well known as the liberal founder of a free library for the town of Liverpool), and

many others who assisted upon this occasion; the meeting had, however, to regret the unexpected absence of the Lord Chancellor of Ireland,* so well known and distinguished as an eminent statist and reformer of our jurisprudence, to whom had been assigned the Presidency of the first department of Jurisprudence and Amendment of the Law.

The principal subjects brought under the consideration of the Association, were confined to five departments and the elements, principles, amelioration, and advancement of the various objects to be obtained were fully considered and discussed under the following heads:—

I.—*Jurisprudence and Amendment of the Law.*

In this department was discussed the science of Civil Jurisprudence, its bearing on the social condition of the people, the advantage derivable from a wide diffusion of its principles, the practical defects in our laws, the evils arising from such defects, and the fitting remedies.

II.—*Education.*

This department dealt with the various questions relating to Education, both industrial and intellectual, whether of the upper, middle, or lower classes of society, the foundation schools of the country, the connection of art and literature with national education, &c. It may also here be stated, that in this section a large amount of statistical knowledge was brought forward, and the department was continually crowded with members and associates of both sexes, who seemed to take an intense interest in the progress of this question during the whole meeting.

III.—*Punishment and Reformation.*

In this department were discussed the various questions relating to the prevention and repression of Crime, the reformation of criminals, the best mode of secondary punishment, prison discipline, and the management of reformatory schools and institutions.

IV.—*Public Health.*

This department considered the various questions relating to the Public Health and the prevention of disease; its object was also to

* The cause of the absence of the Lord Chancellor of Ireland, as stated to the meeting, was singular. His Lordship, it appears, was in the act of embarking from Dublin to Liverpool, when either he himself or the law officers of the Crown, discovered that as Lord Chancellor and Keeper of the Queen's Conscience, he could not leave Ireland without the special permission of Her Majesty, and the delay which took place in obtaining that assent, prevented his attendance at the meeting, but the members had the advantage at its last sitting, of hearing read the brilliant address intended to have been delivered in person by him.

collect statistical evidence of the relative healthiness of different localities, of different industrial occupations, and generally of the influence of exterior circumstances in the production of health or disease; it also entertained discussions as to improvements in house construction (more especially as to the dwellings of the labouring classes), in drainage, warming, ventilation, public baths, and wash-houses; adulteration of food and its effects; the functions of Government in relation to public health, the legislative and administrative machinery expedient for its preservation; sanitary police, quarantine, &c.; poverty in relation to disease, and the effect of unhealthiness in the prosperity and health of nations.

V.—*Social Economy.*

In this department were considered the various questions relating to Social Economics; the conditions of industrial success, whether of nations or individuals; savings' banks and insurance; the relations of employers and employed; strikes and combinations; legislative interference with the hours and wages of labour; legislative regulation of professions, trades, and employments generally, and of price and means of supply; emigration, its effect and true conditions; exercise of public and private charity, relief of the poor; industrial employment of women; industrial and economical instruction of the labouring classes, public amusements, and social economics in relation to education, &c.

In each of these departments, information, statistical illustrations, and important discussions ensued, and a very large number of papers were read tending to promulgate the advancement of knowledge and the improvement and welfare of the labouring classes; and the details connected with the various subjects of science, necessarily required a constant reference to statistical statements and tables. The papers more specifically relating to Statistics, read at this meeting by Dr. Farr on the Influence of Marriage on the French people; by Mr. Danson on the Office and Duty of the Statist, relating to Social Economy; and others connected with this Society, fully sustained the reputation which has so frequently distinguished the Members of the Statistical Society of London. The papers of Professor More on Mutual Life Insurance and Benefit Societies; and of Lord Brougham on the Statistical Use and Progress of Cheap Literature, and his admirable address to the Working Classes; of Mr. Edward Akroyd, M.P., on Penny Savings' Banks, and their extension by means of country associations; and last though not the least in interest, an instructive paper from Miss Florence Nightingale, on the Health of Hospitals, illustrated by her practical experience during her noble mission to the Crimea, excited great interest and attention.

On a Standard *of* Public Health *for* England.

By E. Headlam Greenhow, M.D., *Lecturer on Public Health at St. Thomas's Hospital, &c., &c.*

[Read before the Statistical Society, 15th March, 1859.]

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I.—*Introduction.*

As a teacher of Sanitary Science, I have found it desirable to have a Standard of Reference, showing what may be termed the normal mortality produced by particular diseases in healthy places. I say the normal mortality produced by particular diseases, because, while there are certain diseases, the products of local impurity, which perhaps ought not to exist in a well ordered community, there are other diseases which, although partially preventable, would probably cause a definite amount of premature death even under the most favourable circumstances; of death, that is to say, arising from other causes than natural decay. In the earlier Reports of the Registrar-General—reports which, at the period of their publication, exercised a very powerful influence on the formation of enlightened opinions on sanitary questions—Dr. Farr has contrasted the varying proportions of death from particular diseases in several urban districts and in the rural portions of several counties. I refer especially to the first three annual reports, in which tables of the mortality produced by several diseases in the Metropolis, in groups of densely-peopled Towns, and in several of the principal provincial Cities, are compared with similar tables showing the mortality caused by the same diseases in extensive *Rural* districts, each consisting of several counties from which the more populous towns have been excluded.

But the groups of Towns employed by Dr. Farr did not consist of adjacent towns, but of towns selected from different parts of the kingdom, and the counties, the Rural districts of which were used for the comparison, were also in some instances remote from one another. Of course, therefore, both the Urban and Rural groups comprised places of very different character, both as regards climate and the even more variable circumstances of habit, residence, and occupation peculiar to different populations. Such was, however, the only practicable method of dealing with the subject at a time when the

present careful mode of registering deaths had been in operation for a very brief period, and when the large population of the districts compared with each other, afforded the only guarantee of the reliability of the comparison. And indeed, although, perhaps, the limited period comprised in the calculation does not afford sufficient security against the fluctuations of mortality consequent upon variations of season or the greater or less diffusion of epidemic and contagious diseases, yet the large population of the groups of town and country districts contrasted with each other in these tables of Dr. Farr's, affords considerable assurance of the general correctness of the results at which he arrived.

Now that the registration of the causes of death has existed for twenty years, comprising a great variety of seasons and almost every degree of diffusion of the ordinary epidemic and contagious diseases, it seems desirable to make a more analytical investigation of the different prevalence of certain diseases in Healthy and Unhealthy places, so far as this can be done by means of the death registers. It is true indeed that the death registers do not correctly represent the prevalence of disease, for the *amount* of a disease, that is the number of persons *attacked* by it, and its *intensity*, as measured by the proportion of *fatal* cases, bear no constant relation to each other, but vary at different periods and in different places, but they are at present the only available data from which the prevalence of disease can be estimated. And, as large groups of districts, which comprise several dissimilar towns or the rural districts of separate counties, must commonly include districts of diverse character and of different degrees of salubrity, it seems desirable to select smaller and more compact areas, possessing similarity of character, both as regards the state of the Public Health, climate, and the habits, occupations, and other conditions of their inhabitants. The population of such selected districts should be at least equal to that of a considerable town; and, to ensure, as far as possible, a fair average amount of mortality from epidemic and contagious diseases, the calculations should be extended over a long series of years. Length of time being thus substituted for breadth of space, the results of such investigations would probably be quite as reliable as those obtained from the more extended areas and larger populations employed by the Registrar-General in the valuable reports to which I have already referred.

The population of many of the healthiest rural registration districts is, however, obviously enough, too small to afford a fair standard of comparison; neither is the public health of rural districts of almost exceptional salubrity always properly compared with that of less healthy places. Children and adults, boys and girls, men and women, die in different proportions, and as the aggregate

mortality of a place includes the deaths of persons of both sexes and of all ages, whilst the proportion of the living of each sex and of each age varies much in different places, it is necessary, for an accurate comparison of the sanitary state of any two places by means of their statistics of death, to compare the rate of mortality separately for each sex and for each period of life. Unless the ages both of the living and the dead be taken into consideration, a place which contains an excessive number of children under five years of age, when the proportion of deaths to the number of the living is large, may contrast unfavourably with another place, a smaller proportion of whose population consists of persons of tender years; and yet the latter may, perhaps, really be the unhealthiest district of the two. And so likewise a rural district, in which only a limited and nearly constant number of persons can find employment, may seem to suffer less from phthisical disease than it really does, unless the phthisical death rate be calculated separately for the period of early manhood, because the emigration of young adults produces in such districts a comparative deficiency of persons of that period of life when phthisis is chiefly prevalent. If, however, on the other hand, the towns to which young adults resort for employment be not too distant from their country homes, many of them, when suffering from serious illness which has perhaps been caused, or at least developed, by the unfavourable circumstances of their urban residence, by dissipation, or by the unhealthy character of their occupations, will naturally return to their families, and there dying, swell the death rolls of rural districts by the addition of deaths chiefly or altogether attributable to urban influences.

Thus there are sources of fallacy in the attempt to derive a standard of the proportion of deaths produced by particular diseases in healthy places, either from the deaths in registration districts of small population, or from the deaths in groups of healthy districts taken promiscuously from different and frequently remote parts of the country. The objection to the latter lies in the fact that there is often an absence of conformity in the character and circumstances of different populations. The former is liable to the objections already detailed, and to the want of confidence that must always be entertained respecting averages deduced from a very limited number of facts.

II.—*Groups of Selected Districts.*

It occurred to me, some months ago, that these sources of fallacy might, in a great measure, be obviated by selecting groups of Contiguous Healthy Districts, comprising an extensive area of country and containing a population sufficiently large to afford a considerable number of deaths. I say *groups of Contiguous* Healthy Districts,

because since the climate and the race, occupations, and habits of the people vary much in different parts of England, I have thought it desirable to select groups of districts from several parts of the country. In furtherance of this plan, I have selected Three compact groups of contiguous healthy rural registration districts, each comprising a considerable area of country, and containing a considerable population, and have calculated the rate of death from certain diseases for each group of districts, in the same manner as if it formed but a single registration district. The description of these groups and the results of my investigation into their mortality form the subject of this paper, which I am induced to offer to the notice of the Society, in the hope that such standard death rates as I have found useful for my purpose, may not be unacceptable to other inquirers, until they be superseded by standards of a more authorized and perfect character.

The first group of districts, which will henceforward be referred to briefly as "*The Northern Group*," is formed of the Registration districts of Glendale, Rothbury, Bellingham, and Haltwhistle, in Northumberland, and of Brampton, and Longtown in Cumberland. These districts, which include nearly all the hilly parts of Northumberland, border Scotland from the Solway Frith nearly to the German Ocean. The entire group comprises an area of 1,256 square miles, thinly peopled by 56,637 persons at the time of taking the census of 1851. Brampton and Longtown, the former of which contained a population of 3,074 persons, and the latter a population of 2,142 persons in 1851, are the only places in the entire group of districts which are designated as towns in the census report. The population of the entire group consists chiefly, but not quite exclusively, of persons engaged in agricultural pursuits and in supplying the wants of a rural population, for there are also a notable proportion of coal miners and a few stone quarrymen. The district is one of the most thinly peopled in England, Brampton, the most densely inhabited portion, having only an average of 76 and Bellingham of only 18 persons to the square mile. The average annual death-rate of these northern districts for the ten years 1841-50 according to the Registrar-General, was 15 per 1,000 in Glendale and Rothbury, 16 in Haltwhistle, and 17 in Bellingham, Brampton, and Longtown. The average annual death-rate of the entire group, treated as a single district for the nine years 1847-55, as computed by myself, was 16 in each 1,000 persons of all ages and of both sexes.

The second or "*Southern Group*," consists of the districts of Godstone, Reigate, Dorking, and Hambledon in Surrey, and of Petworth and Midhurst in Sussex. This, like the "Northern Group," consists partly of a hilly region. Its area is little more

than one-third the area of the "Northern Group," for it comprises only 470 square miles; whilst on the other hand, its population, which consisted of 71,330 persons at the time of the last census, is more than one-fourth greater than that of the northern group. The Southern Group contains the towns of Dorking and Petworth and the parliamentary boroughs of Reigate and Midhurst. The population of the town of Dorking in 1851 was 3,490; that of Petworth 2,427. The borough of Reigate, which is, however, coextensive with the parish, contained 4,927 persons in 1851; that of Midhurst, which comprises several parishes, contained at the same period a population of 7,021 persons. The population of the entire group is chiefly engaged in agricultural pursuits, but contains of course a proportion of persons employed in supplying the necessaries of life. The Southern is more densely inhabited than the Northern group; the average number of persons to each square mile, varies from 129 in Godstone to 182 in Dorking. The annual average death-rate of the six districts for the decennial period 1841-50, according to the Registrar-General, was 16 per 1,000 in Hambledon and Reigate, and 17 per 1,000 in Dorking, Godstone, Petworth, and Midhurst. The average annual death-rate of the entire group of districts treated as a single district for the nine years 1847-55 as computed by myself, was, in round numbers, 17⅓ per 1,000 persons of all ages and of both sexes.

The third or "*South-Western Group*," is formed of the Registration districts of Barnstaple, South Molton, Crediton, Okehampton, Torrington, Bideford, and Holsworthy in Devonshire, and of Stratton, Launceston, and Camelford in Cornwall. The entire district lies in the north of Devon and Cornwall, and includes an area of 1,449 square miles, occupied by a population of 183,154 persons. The South-Western Group is intermediate between the Northern and Southern Groups in density of population. Bideford, the most densely peopled district, has an average of 171 persons to a square mile, whilst Camelford, Okehampton, and Stratton have at the rate of a little over 100, and Holsworthy of only 84 inhabitants on each square mile of country. The South-Western Group contains a much greater proportion of urban inhabitants than either of the other groups. Nearly one-fifth of the entire population resides in districts which contain boroughs or towns, of which the whole district contains seven, namely, the boroughs of Barnstaple, Bideford, South Molton, Launceston, and Torrington, and the towns of Crediton and Ilfracombe. The collective population of the seven places amounted to 35,186 in 1851, of which 11,371 belong to Barnstaple and 5,775 to Bideford. The population is chiefly agricultural, but contains likewise both a small manufacturing and a small maritime element, and one-fifth of the adult male

inhabitants of Camelford are employed in slate quarrying. Rather more than one-fifth of the adult women of Torrington are engaged in glove making, and a small proportion of the women of each of the other six Devonshire districts are employed in the manufacture either of gloves or lace. Somewhat more than one-seventh of the adult women of Crediton, and a smaller proportion of those of Okehampton and South Molton are employed in the manufacture of woollen fabrics. The annual average death-rate of the ten districts for the decennial period, 1841-50, according to the Registrar-General, was 16 per 1,000 in Holsworthy and Okehampton, 17 in Camelford, Launceston, Torrington, Crediton, Barnstaple, Bideford, and Stratton, and 18 in South Molton. The average annual death-rate of the entire group of districts treated as a single district for the nine years 1847-55, as calculated by myself, was a little more than 17 per 1,000 persons of all ages and of both sexes.

The three groups of healthy districts here described may very fairly be employed as standards with which the mortality of other places from particular diseases may be compared. They are each sufficiently populous to avoid the doubt apt to be entertained when averages are founded upon the small number of deaths that occur in a small population. To avoid the errors that might arise from the varying prevalence of contagious and epidemic diseases at different periods, the calculations extend over the Nine Years, 1847-55; this particular term being selected in order that the year 1851, in which the last Census was taken, should be the middle year of the series; for I wished to use the population returns of the Census as the divisors in calculating the death-rates. It might, perhaps, have appeared more accurate if the average population of each group of districts had been estimated according to the rate of increase in each place during the decennial period intermediate between the Census of 1841 and that of 1851; but the accuracy of such an estimate would have been more apparent than real, for it would have rested on the assumption that the movements of the population had been uniform, and its progress constant, whereas both are liable to many disturbances. I believe the plan I have adopted is as nearly accurate as can be attained from the data at my command, and there is no practicable plan which is not open to the chance of minute inaccuracy. The results of my investigation must, therefore, be received only as close approximations to truth; and yet, as the errors that can arise from the different rate of progress of a population at different periods so near to an accurate census as four years on either side of it can be only fractional, they may be safely employed for the purpose they are intended to serve, provided undue importance be not attached to *minute* differences in comparing the death-rates with those of other places.

III.—*Course of Investigation Pursued.*

By the courtesy of the Registrar-General and of Dr. Farr, F.R.S., I have been permitted to extract the facts necessary to my purpose from the manuscript tables of district mortality in the General Register Office. I desire also to express my obligations to Mr. T. A. Welton for the valuable assistance he has afforded me, both in abstracting the facts at Somerset House and also in working out the death-rates. Besides the class of diseases grouped together by the Registrar-General under the name of Diseases of the Respiratory Organs, my investigation has extended to twenty-three particular diseases, viz.,

Small Pox,	Tabes Mesenterica,
Measles,	Phthisis,
Scarlatina,	Hydrocephalus,
Hooping Cough,	Cephalitis,
Croup,	Apoplexy,
Diarrhœa,	Paralysis,
Dysentery,	Convulsions,
Cholera,	Diseases of the Brain, &c.,
Influenza,	Bronchitis,
Typhus,	Pneumonia, and
Erysipelas,	Teething.
Scrofula,	

Several diseases, included in a more extensive investigation communicated to the General Board of Health last spring and published as a Parliamentary Paper,* have been omitted from the present enquiry, because the results afforded by them were negative or unimportant. Cephalitis and the undefined cerebral affections registered under the title of "Disease of the Brain, &c.," have been added to the present investigation, that the group of infantile nervous diseases may be rendered more complete. In order that the rates of mortality from all causes in the several groups of districts might be compared with one another, and also with the general death-rates of other districts, I have calculated the average annual proportion of deaths from All Causes in each of the three groups for the nine years 1847-55. To avoid the errors that might arise from the different proportions of males and females and of persons of the several periods of life in different populations, and to secure the possibility of comparing like things with like in the use of the results as standard rates of mortality, the death-rates have been calculated separately for each sex,

* Papers Relating to the Sanitary State of the People of England: being the Results of an Inquiry into the different Proportions of Deaths produced by certain Diseases in different Districts in England, communicated to the General Board of Health by Edward Headlam Greenhow, M.D., &c. With an Introductory Report by the Medical Officer of the Board on the preventability of certain kinds of premature death.

for children under five years of age, and for persons over five years of age, as well as for persons of all ages. I have also calculated the rate of mortality from certain diseases usually most fatal after middle life for persons of each sex over fifty years of age. As the mortality produced by Pulmonary affections is very different at the different periods of life, and that caused by Consumption in particular is greatest in early manhood, I have calculated the proportion of deaths produced by Phthisis and diseases of the respiratory organs in each sex separately for eight different ages, viz., for children under five years and between five and fifteen years of age; for persons between fifteen and twenty; twenty and twenty-five; twenty-five and thirty; thirty and forty; forty and fifty years of age; and for all ages above fifty years. The death-rates have in each case been calculated for one hundred thousand persons. This avoids the use of fractions, and will enable them to be the more readily compared with my former papers on analogous subjects. That the paper may be more conveniently referred to as a standard of reference, I have arranged the detailed results of the investigation in a series of tables at the end. Each reader can thus select such facts and arrange them in such a manner as may best suit his particular purpose. The following list shows the order and contents of the several tables.

Table I.—Average Annual Proportion of Deaths from all causes, and from the several particular causes in each Group of Districts during the nine years 1847-55, per 100,000 males and females of *all* ages.

Table II.—Average Annual Proportion of Deaths from all causes, and from the several particular causes in each Group of Districts during the nine years 1847-55, per 100,000 male and female children *under* five years of age.

Table III.—Average Annual Proportion of Deaths from all causes, and from the several particular causes in each Group of Districts during the nine years 1847-55, per 100,000 persons of each sex *over* five years of age.

Errors are so liable to occur in the registration of the causes of death, and particularly in registering deaths produced by disease of the lungs, by the several nervous diseases of infancy, and by diarrhœal diseases, that I have considered it more reliable, and certainly more convenient, to group these diseases into classes. The main facts are in this manner brought before the eye without the incumbrance of details. There are also certain diseases which prevail chiefly, or almost exclusively, at particular periods of life; as the nervous diseases of infancy and the exanthematous diseases which practically are all but limited to the period of life anterior to the fifth year; as apoplexy and paralysis, which are most frequently fatal after middle life; and, as affections of the lungs, which, exclusive

of phthisis, produce a considerable mortality at the two extremes of life, in infancy and old age, but are comparatively harmless at the intermediate period. I say diseases of the organs of respiration are comparatively harmless between childhood and old age, because the normal mortality they produce at that period of life is insignificant compared to the mortality in early and advanced age. But there are districts where this so called normal condition is disturbed, and where a considerable mortality is occasioned by such diseases in middle life. Such cases are, however, exceptional; and, I believe, in every instance explicable by the prevalence of some particular occupation among the inhabitants, or by some other definite local cause. These circumstances afford additional facilities for subdividing the results of the inquiry, and I now, therefore, proceed to arrange the more important facts brought to light by it in a more convenient form, leaving such persons as may desire to examine them in greater detail to refer to the Tables at the end of the paper.

IV.—*Statement of Results.*

The annexed Table (A) shows the average annual proportion of deaths per 100,000 Persons without limitation of age or sex, produced by All Causes, by Pulmonary Affections, by Alvine Flux, and by Typhus, in each of the three groups of districts during the nine years. All deaths, whether certified or not, are of course comprised in calculating the rate of deaths from all causes. The class Pulmonary Affections includes Laryngitis, Bronchitis, Pleurisy, Pneumonia, Asthma, Disease of the Lungs, &c., and Phthisis. These diseases form a convenient and natural group, and although, as will presently appear, Phthisis has also been treated separately, so much doubt

Table A.—Average Annual Proportion of Deaths *produced by the several undermentioned* Causes *in each* Group of Districts *during the Nine Years* 1847-55, *per* 100,000 Persons of both sexes and all Ages.

1	2	3	4
Causes of Death.	Northern Group.	Southern Group.	S.-Western Group.
All Causes	1,626	1,764	1,736
Pulmonary Affections	301	432	420
Alvine Flux	29	46	29
Typhus	50	74	64

must frequently exist as to the correct discrimination of Phthisis from other chronic diseases of the lungs, that I consider it better at present to group it with the other diseases of the organs of respiration. Diarrhœa, Dysentery, and Cholera, are comprised under the term Alvine Flux. The two varieties of continued fever, respectively called Typhoid and Typhus fever, are both registered under the common name of Typhus. This is perhaps unavoidable, for however desirable it may appear to subdivide the causes of death in this and analogous cases, it is very questionable whether greater accuracy could be successfully attained at present.

In Table A the death-rates are given irrespective of sex, but as the rate of death, both from all causes and from each particular cause, is usually different in males and females, the same facts are presented in Table B separately for each sex.

TABLE B.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by the several undermentioned* CAUSES *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *in* PERSONS OF ALL AGES SEPARATELY FOR EACH SEX.

1	2	3	4	5	6	7
CAUSES OF DEATH.	Northern Group.		Southern Group.		S.-Western Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
All Causes	1,640	1,612	1,766	1,762	1,757	1,716
Pulmonary Affections	297	304	411	454	446	395
Alvine Flux	30	26	49	44	31	28
Typhus	49	51	71	77	59	68

Table (C) shows the average annual proportion of deaths per 100,000 male and female children under five years of age, produced by All Causes; by Pulmonary Affections; by the four Contagious and Epidemic Diseases Small Pox, Measles, Scarlatina, and Hooping Cough; by Croup; by Alvine Flux; by Strumous Diseases, exclusive of Phthisis referred to the class of Pulmonary Affections, and Hydrocephalus, which, together with Cephalitis, Convulsions, Disease of the Brain, &c., and Teething, forms the class to which I have applied the term Nervous Diseases of Infancy.

TABLE C.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by the several undermentioned* CAUSES *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *in Children* UNDER FIVE YEARS OF AGE.

1	2	3	4	5	6	7
CAUSES OF DEATH.	Northern Group.		Southern Group.		S.-Western Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
All Causes	3,693	3,194	4,080	3,450	4,099	3,467
Pulmonary Affections	328	220	665	589	869	704
Small Pox	67	61	14	28	42	41
Measles	143	132	69	57	86	80
Scarlatina	336	264	216	220	300	269
Hooping Cough	112	233	188	262	262	292
Croup	126	132	101	66	173	162
Alvine Flux	37	55	188	123	100	61
Strumous Diseases	60	49	122	142	62	59
Nervous Diseases of Infancy	289	264	1,120	773	685	514

Thus the group of Strumous Diseases consists only of Scrofula and Tabes Mesenterica. The class Nervous Diseases of Infancy, comprises the diseases registered under the names of Cephalitis and Disease of the Brain, &c. in addition to the three diseases Hydrocephalus, Convulsions, and Teething, grouped together in former papers of mine under the name of Nervous Diseases of Children; and, I here refer to the difference in the two groups to prevent the errors liable to occur if they should be compared without consideration of their different composition.

Table (D) shows the average annual proportion of deaths produced by Pulmonary Affections in each sex under 5 years of age, between the ages of 5 and 15; 15 and 20; 20 and 25; 25 and 30; 30 and 40; 40 and 50 years; and for persons upwards of 50 years of age.

TABLE D.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by* PULMONARY AFFECTIONS *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *at the several* UNDERMENTIONED PERIODS OF LIFE.

1	2	3	4	5	6	7
PERIOD OF LIFE.	Northern Group.		Southern Group.		S.-Western Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
Under Five Years.....	328	220	665	589	869	704
5—15	96	90	86	121	79	113
15—20	169	323	217	516	154	259
20—25	379	402	517	611	399	400
25—30	349	420	510	635	415	356
30—40	335	376	390	485	337	339
40—50	260	346	428	434	403	324
50 Yrs. and upwards	572	470	728	645	955	688
ALL AGES	297	304	411	454	446	395

Tables (E) and (F) comprise the same facts as Table D, but in more analytical form. Table E shows the proportion of deaths produced in each Group of Districts by Phthisis, in each sex, and at each of the periods of life mentioned in connection with Table D; and Table F shows similar facts for Diseases of the Respiratory Organs, that is to say, for Laryngitis, Bronchitis, Pleurisy, Pneumonia, Asthma, and Disease of the Lungs, &c., conjointly.

TABLE E. — AVERAGE ANNUAL PROPORTION OF DEATHS *produced by* PHTHISIS *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *at the several* UNDERMENTIONED PERIODS OF LIFE.

1	2	3	4	5	6	7
PERIOD OF LIFE.	Northern Group.		Southern Group.		S.-Western Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
Under Five Years.....	75	64	101	76	153	154
5—15	79	83	52	94	51	75
15—20	161	295	191	453	120	225
20—25	361	393	469	579	349	352
25—30	328	384	463	604	343	323
30—40	312	350	306	423	251	299
40—50	187	304	311	371	263	255
50 Yrs. and upwards	281	224	188	219	275	240
ALL AGES	200	229	212	288	195	214

TABLE F. — AVERAGE ANNUAL PROPORTION OF DEATHS *produced by* DISEASES OF THE RESPIRATORY ORGANS *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *at the several* UNDERMENTIONED PERIODS OF LIFE.

1	2	3	4	5	6	7
PERIOD OF LIFE	Northern Group.		Southern Group.		S.-Western Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
Under Five Years.....	253	156	564	513	716	550
5—15	17	7	34	27	28	38
15—20	8	28	26	63	34	34
20—25	18	9	48	32	50	48
25—30	21	36	47	31	72	33
30—40	23	26	84	62	86	40
40—50	73	42	117	63	140	69
50 Yrs. and upwards	291	246	540	426	677	448
ALL AGES	97	75	199	166	251	181

Lastly, Table (G) shows the average annual proportion of deaths produced by All Causes, and by Diseases of the Respiratory Organs, Influenza, Phthisis, Apoplexy, and Paralysis, in persons of each sex over fifty years of age.

TABLE G.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by the several undermentioned* CAUSES *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *in Persons of each Sex* OVER FIFTY YEARS OF AGE.

1	2	3	4	5	6	7
CAUSES OF DEATH.	Northern Group.		Southern Group.		S.-Western Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
All Causes	4,301	4,195	4,527	4,386	4,430	4,347
Diseases of Respiratory Organs	291	246	540	426	677	448
Influenza	112	126	86	82	130	138
Phthisis	281	224	188	219	275	240
Apoplexy	139	88	270	342	285	233
Paralysis	341	348	207	266	186	197

V.—*Conclusion.*

The purpose of this Paper, as described in the title and introductory observations, is to supply a standard of the normal mortality produced by certain diseases in healthy places. It is, indeed, too probable that the standard of health presented by the thinly peopled rural districts of Northumberland and Cumberland, of Surrey and Sussex, and of Devonshire and Cornwall, is at present unattainable for densely inhabited towns; unattainable because our acquaintance with the causes that modify the public health is still imperfect. On the other hand, a comparison of the death-rates of the several Groups of Districts with each other shows that conditions injurious to the public health must exist even in some of these healthy places. Why, for example, should the South Western Group lose upwards of 200 and the Southern Group nearly 100 persons more by death annually in proportion to their respective populations than the Northern

Group, unless conditions unfavourable to health exist in the two former from which the inhabitants of the latter are exempt? Hence even these standard districts, the public health of which is at present so eminently superior to the average condition of the public health in England, must be received as only comparative standards, and not as affording a correct illustration of the rate of mortality that would prevail if life were prolonged to its natural duration. The fact that some even of these healthy districts present a higher than the normal rate of mortality, does but afford additional encouragement for sanitary exertions, since a comparison of their death-rates with those of unhealthy places, or even of the country at large, demonstrates the great extent of the field which is open to such exertions. A single illustration will at once serve to show the extent of this field and the advantage of possessing such a standard of the public health as I have here endeavoured to supply, and will form a suitable termination to this paper. Pulmonary affections of all kinds, including Phthisis, produced on an average 98,969 deaths in England and Wales in each of the nine years 1847-55. If the deaths from Pulmonary affections in England and Wales, in each sex and for each period of life, had been at the same rate during these nine years as in the Northern Group of Districts, the average annual number of deaths would have been only 54,098. The two other groups of districts present a less favourable aspect. The average annual number of deaths from Pulmonary Affections in England and Wales would have been 73,555 if the same rate of mortality had prevailed during the nine years as in the South-Western Group, and 79,034 if the same rate of mortality had prevailed as in the Southern Group of Districts. If we may assume—and we may surely do so—that the healthy Northern Group pretty fairly represents the normal rate of death from affections of the lungs in this country, then is the mortality of England from this single class of diseases aggravated to the extent of nearly 45,000 deaths annually by the unhealthy, and it may be presumed, in some measure removable conditions to which the population of England is exposed.

Appendix of Tables.

TABLE I.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by the several undermentioned* CAUSES *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, WITHOUT DISTINCTION OF AGE.

1	2	3	4	5	6	7
CAUSES OF DEATH.	Northern Group.		Southern Group.		S.-Westn. Group.	
	Population in 1851, 56,637. Area in Sq. Miles, 1,256.		Population in 1851, 71,330. Area in Sq. Miles, 470.		Population in 1851, 183,154. Area in Sq. Miles, 1,419.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male per 100,000.	*Female*, per 100,000.
All Causes	1,640	1,612	1,766	1,762	1,757	1,716
Diseases of the Respiratory Organs	97	75	199	166	251	181
Small Pox	15	12	8	5	10	8
Measles	24	22	12	11	14	12
Scarlatina	76	57	56	61	75	68
Hooping Cough	17	30	26	38	36	39
Croup	21	21	15	15	28	24
Diarrhœa	17	15	36	33	21	17
Dysentery	4	3	7	7	2	3
Cholera	9	8	6	4	8	8
Influenza	24	26	23	21	30	32
Typhus	49	51	71	77	59	68
Erysipelas	10	6	11	8	8	7
Scrofula	8	7	17	18	12	7
Tabes Mesenterica	6	7	18	20	8	7
Phthisis	200	229	212	288	195	214
Hydrocephalus	26	17	35	27	29	24
Cephalitis	10	11	13	8	14	12
Apoplexy	28	20	52	67	60	52
Paralysis	56	62	37	43	35	40
Convulsions	8	11	108	76	56	41
Disease of Brain, &c.	9	9	20	16	13	12
Bronchitis	30	23	58	53	49	44
Pneumonia	39	26	101	74	161	107
Teething	9	7	12	10	9	7

TABLE II.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by the several undermentioned* CAUSES *in each* GROUP OF DISTRICTS, *during the Nine Years* 1847-55, *in Children* UNDER FIVE YEARS OF AGE.

1	2	3	4	5	6	7
CAUSES OF DEATH.	Northern Group.		Southern Group.		S.-Westn. Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
All Causes	3,693	3,194	4,080	3,450	4,099	3,467
Diseases of the Respiratory Organs	253	156	564	513	716	550
Small Pox	67	61	14	28	42	41
Measles	143	132	69	57	86	80
Scarlatina	336	264	216	220	300	269
Hooping Cough	112	233	188	262	262	292
Croup	126	132	101	66	173	162
Diarrhœa	29	49	163	102	79	48
Dysentery	....	3	18	21	1	2
Cholera	8	3	7	....	20	11
Influenza	6	6	46	33	44	36
Scrofula	20	6	21	26	20	20
Tabes Mesenterica	40	43	101	116	42	39
Phthisis	75	64	101	76	153	154
Hydrocephalus	126	92	193	137	156	110
Cephalitis	20	21	25	9	20	28
Convulsions	60	74	792	532	420	306
Disease of Brain, &c.	17	25	16	24	22	14
Bronchitis	67	43	115	109	84	72
Pneumonia	169	104	411	364	598	451
Teething	66	52	94	71	67	56

TABLE III.—AVERAGE ANNUAL PROPORTION OF DEATHS *produced by the several undermentioned* CAUSES *in each* GROUP OF DISTRICTS *during the Nine Years* 1847-55, *in Persons* OVER FIVE YEARS OF AGE.

1	2	3	4	5	6	7
CAUSES OF DEATH.	Northern Group.		Southern Group.		S.-Westn. Group.	
	DEATH RATES.		DEATH RATES.		DEATH RATES.	
	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.	Male, per 100,000.	*Female*, per 100,000.
All Causes	1,318	1,378	1,423	1,495	1,407	1,467
Diseases of the Respiratory Organs	73	63	144	111	182	128
Small Pox	7	5	8	2	6	4
Measles	5	6	3	3	3	2
Scarlatina	35	27	32	36	42	39
Hooping Cough	2	....	1	2	2	3
Croup	4	4	2	6	6	5
Diarrhœa	15	10	17	22	12	12
Dysentery	4	3	6	5	3	3
Cholera	10	9	6	5	7	8
Influenza	27	29	20	19	29	31
Scrofula	6	7	16	17	10	6
Tabes Mesenterica	1	2	5	4	3	3
Phthisis	219	253	229	322	202	223
Hydrocephalus	11	6	11	9	10	12
Cephalitis	8	9	11	8	13	9
Convulsions	....	1	5	4	2	4
Disease of the Brain, &c.	8	7	20	15	11	12
Bronchitis	24	20	49	44	43	40
Pneumonia	19	14	54	29	96	58

On the FINANCIAL PROSPECTS *of* BRITISH RAILWAYS.

By SAMUEL BROWN, F.R.G.S. and F.S.S.

[Read before Section (F), Economic Science and Statistics, at the Meeting of the British Association, at Leeds, September, 1858.]

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I.—*Introduction.*

CONSIDERABLE attention has lately been drawn to the very low rate of profit obtained by investments in the Original Shares of most of the Great Railways of this Country. Considering the vast benefits which have been conferred upon the Community by the extension of the Railway System—the facilities of locomotion—the development of Commerce—the rapidity of postal communication—the diminution of the cost of all articles of trade and consumption so far as it depends upon the expense of carriage—and the numberless other advantages which have accrued to the public from the Capital sunk therein, it seems peculiarly hard that the Original Investors should reap so little of the fruits of their energy and enterprise, and that all other classes should gain so much. An enquiry into the principal causes which may be supposed to have contributed to such fatal results may lead to suggestions for improvement in the future, and a discussion on the subject cannot be out of place in a Congress comprising so many men of scientific attainments or practical experience.

It may be argued that Railway Shareholders themselves are the proper parties to make the investigation, and that the public may rest satisfied with the benefits evidently acquired at their cost. But this would be taking a very narrow view of the subject. The public have a greater interest in the discussion being conducted on broad and open principles than may at first sight appear. The Shareholders in particular Railways would not unnaturally be actuated with a view to the profits of their own concern modified only by the interests which they might hold simultaneously in other Railways, and we have already seen enough of the jealousies, the quarrels, and the dangerous or ruinous competition which have so long existed, or so frequently been excited between rival Companies not to fear that there would be little chance of a calm and candid discussion of the

question being undertaken at all, if we are to wait till full harmony is re-established, and a general combination of such rival interests satisfactorily adjusted. In the meantime a vast fund of nearly 400 Millions Sterling, which under judicious regulations might become a safe and valuable mode of investment, is left liable to fluctuations, which render it, as we shall see hereafter, one of the most changeable and precarious of any for the employment of capital. Nor is it unworthy of remark that if only those who are directly interested in increasing the profits agree to a cessation of mutual hostilities, and combine to better their condition, it may be that those suggestions, which would benefit alike the Shareholders and the public, would be overlooked, and more prominence given to those which would improve the position of the former without due regard to the interests of the latter.

II.—*Railway Progress to End of* 1857.

A brief summary of the leading facts, showing the extension and present position of the Railway System of this Country, is necessary to understand fully the Causes of its present very unsatisfactory Financial State; and as my object is not to criticise the management, or expose the failures or weakness of any particular Company, I shall confine myself principally to a Summary of the facts given in the very able Reports presented by Captain Galton to the Board of Trade on the proceedings of his Department—relating to Railways.

Some very important Statistics have been collected and published at different times in the Railway Journals, but it may be reasonably supposed that the most complete Statements are those given in the above Reports. Independent of the authority on which they rest, the minute analysis and elaborate comparisons which are there recorded of the totals in each Class of Facts with those of preceding years deserve the highest praise, and the ability with which the Reports are drawn up cannot but be universally admitted.

It appears, then, from the last Report, that in the Session of 1857 the number of *Railway Bills* brought before Parliament was 130, for 1,470 miles of Railway. Only 82 passed, of which 53 authorized the Construction of 663 miles, viz., 344 in England and Wales, being chiefly extensions or branches of lines already authorized, 169 in Scotland, and about 150 in Ireland; the Money to be raised for this purpose was 10,346,413*l.*

	Miles.
The total Length of Line authorized by Parliament down to the end of 1857 was	15,331
Abandoned by Subsequent Acts or by warrants under authority of a general Act passed in 1847	1,504
	13,827

	Open on 31st Decr., 1857.	Authorized, but not opened.	Total.
	Miles.	Miles.	Miles.
England and Wales	6,706	3,307	10,013
Scotland	1,243	573	1,816
Ireland	1,070	928	1,998
	9,019	4,808	13,827
Open for Passenger Traffic belonging to private Individuals or Companies	36	....	....
Only used for Mineral Traffic	61	....	....
	9,116	....	....

Out of the 4,808 miles Unopened, for 2,356 miles the powers for compulsory purchase of land and completion of the works have expired; and for 234 of the remainder the powers for compulsory purchase of the land have been allowed to expire, giving a total of 2,590 miles which it is not probable will be made.

	£
The total amount of *Money authorized* to be raised by Shares and Loans up to the end of 1857 was	387,051,735
Of which there had been raised at that date	314,989,826
Leaving amount to be raised	72,061,909

Of the 8,718 Miles open on the 31st December, 1856,

	Narrow Gauge.	Broad Gauge.	Mixed Gauge.	Irish Gauge.	Total.
	Miles.	Miles.	Miles.	Miles.	Miles.
In England	5,776	740	261	....	6,777
„ Scotland	1,269	....	....	....	1,269
„ Ireland	8	....	....	1,062	1,070
Total	7,053	740	261	1,062	9,116

Of which were *Single* Lines:—

	Miles.
In England	1,715
„ Scotland	409
„ Ireland	651
Total	2,775

The length of new Lines reported to be in the *Course of Construction* on the 30th June, 1857, was 1,004 miles, on which 14,037 persons were employed, or an average of 13·86 per mile. The money

raised by Shares and Loans in that year amounted to 6,213,932*l.*, and 398 miles of railway were opened during the year.

The highest average number of persons employed was in 1849, when 103,816 were employed on 1,504 miles, or 69 per mile; 29,574,719*l.* was raised by Shares and Loans and 869 miles were opened.

The average number of persons employed per mile has diminished gradually from 55·36 in 1853, to 37·87 in 1856, but in 1857 the average is again raised to 43·86, nearly the same as in 1855. Since 1849 the average amount raised per Annum was 10,618,768*l.*

On 30th June, 1857, there were 8,942 miles open for traffic, and the number of persons employed thereon was 109,660 or 12·36 per mile.

The average number of persons employed per Mile Opened was lowest in 1851, 9·49, and highest (nearly the same as 1857) in 1848, 12·3 per mile.

The average number of *Stations* per mile was lowest in 1854, viz., ·30, or 3 in every 10 miles; and the highest in 1857, viz., ·35 per mile, or 7 in every 2 miles, there being 3,121 Stations for 8,942 miles.

In the Appendix to the Report is given the Class of persons employed every year since 1848; and the proportion of each for 1857 stands thus:—

	Number.	Average per Mile.		Number.	Average per Mile.
Secretaries or Managers	221	·024	Guards or Breaksmen	3,716	·415
Treasurers	26	·003	Artificers	21,337	2·386
Engineers	150	·017	Switchmen	3,263	·364
Superintendents	398	·044	Gatekeepers	1,998	·223
Storekeepers	198	·022	Policemen or Watchmen	2,349	·262
Accountants or Cashiers	201	·022	Porters or Messengers	17,091	1·911
Inspectors or Timekeepers	997	·111	Platelayers	8,260	·923
Station Masters	2,471	·276	Labourers	26,285	2·948
Ticket Collectors	404	·045	Miscellaneous Employment	2,885	·322
Draughtsmen	156	·017			
Clerks	8,712	·974			
Foremen	1,335	·149			
Engine Drivers	3,563	·398			
Assistant Engine Drivers or Foremen	3,644	·407	Total	109,660	12·263

The total number of Passengers conveyed gradually rises from 1849 to 1857.

(A.)—*Passenger and Goods Traffic*, 1849-57.

Year.	Passengers.	Passenger per Miles.	Miles Opened.	Total Receipts from Passengers.	Receipts per Mile.	Total Receipts from Goods.	Receipts per Mile.	Total Receipts from Goods and Passengers.	Receipts Per Mile.
	No.	No.	No.	£	£	£	£	£	£
In 1849 ...	63,841,539	11,442	5,580	6,277,892	1,125	5,528,606	990	11,806,498	2,115
„ 1856 ...	129,317,592	15,213	8,520	10,153,745	1,194	13,011,748	1,530	23,165,493	2,724
„ 1857 ..	139,008,888	15,598	8,901	10,592,793	1,191	13,581,812	1,524	24,174,610	2,715

Showing an increase per cent. in 1857 over 1849 of 59·69 in miles opened, 117·74 in number of Passengers carried, 68·73 in receipts from Passengers, 145·66 in receipts from goods carried, and 104·75 in total of both.

(B.)—*Total Revenue*, 1856-7.

	1856.	Per Mile.	1857.	Per Mile.
	£	£	£	£
Total Receipts from all Sources in England and Wales	19,728,311	3,120	20,527,748	3,105
Scotland	2,319,217	2,022	2,501,478	2,040
Ireland	1,117,965	1,092	1,145,384	1,076
Total	23,165,493	2,724	24,174,610	2,715

The total amount of *Capital raised* for the construction of Railways on 31st December, 1857, was 314,989,626*l.*, averaging 34,950*l.* per mile opened, (viz., England and Wales 39,275*l.* per mile, Scotland 28,225*l.* per mile, Ireland 15,664*l.* per mile). The Lines reported to be in course of construction are about *one-ninth* of the whole length completed and under Construction, and some portion of the cost belongs to these Lines. Recently, however, the average cost of construction has much diminished. The independent lines for which Acts of Parliament have been obtained since 1848 average only in cost 11,823*l.* per mile, viz., 14,559*l.* in England, 7,243*l.* in Scotland, and 7,303*l.* in Ireland.

The following Table shows the amount of Capital raised in each year since 1849, the proportion of Debenture and Share Capital, and the average rate of interest on each.

(C.)—*Interest, Dividends, and Capital, 1849-57.*

To 31st Decr.	Total Raised by Shares and Loans.	Average Interest, On *Loans.*	Average Interest, On *Pref. Shares*	Capital. Percentage Proportions. Ord.	Pref.	Loan.	Both.	Total.	Percentage of *Gross Receipts* to Capital and Loans after Deducting Expenses.	Average Interest on *Preference Capital* and *Loans.*	Average Rate of *Dividends* on Ordinary Capital.
	£	Per ct.	Per ct.	P. ct.	P. ct.	P. ct.	P. ct.	Per ct.	Per cent.	Per cent.	Per cent.
1849....	229,747,778	4·67	5·63	69	9	22	31	100	2·83	4·94	1·88
1850....	240,270,745	4·60	5·61	63	14	23	37	100	3·02	5·	1·83
1851....	248,240,896	4·54	5·26	63	14	23	37	100	3·32	4·79	2·44
1852....	264,165,672	4·18	5·21	62	14	24	38	100	3·27	4·63	2·40
1853....	273,324,514	4·14	5·	61	15	24	39	100	3·63	4·50	3·05
1854....	286,068,794	4·27	5·01	58	17	25	42	100	3·88	4·58	3·39
1855....	297,583,284	4·35	4·92	57	18	25	43	100	3·76	4·60	3·12
1856....	308,775,894	4·66	4·78	57	18	25	43	100	3·97	4·71	3·40
1857....	314,989,826	4·52	4·86	57	18	25	43	100	4·06	4·67	3·60

In 1857 the Preference and Loan Capital was 43 per cent. of the whole. The Interest was 4·67 per cent., thus reducing the Interest of Share Capital from above 4 to 3·60 per cent. The receipts have increased steadily, but the large amount of Preference Capital keeps down the Dividends on Ordinary Shares.

In 1857, 139,008,888 persons were carried, of whom 236 were killed and 738 injured; but of Passengers, only 48 were killed and 646 injured, and of these only 18 were killed and 453 injured from causes beyond their own control in every 100,000,000 persons who travelled; though this is considerably beyond the proportion of preceding years.

In addition to the facts given above in Captain Galton's reports, a Parliamentary Document has recently appeared (431/57–8), being a return ordered to be printed on the 14th July on the motion of Mr. Lowe, showing that the total amount of Capital and Loans for Railways authorized by Acts of Parliament previous to the 31st December, 1857, was 387,051,735*l.*, of which it appears by Captain Galton's last Report that 314,989,826*l.* had been raised to that date, leaving 72,061,909*l.* still to be raised. The proportions of the Ordinary and Preference Share Capital and Loans at the close of 1857, with the interest or Dividends thereon in the year, stood as follows:—

	Capital Raised.	Dividends or Interest in 1857.	Per Cent.
	£	£	
Ordinary Share	178,567,935	6,438,088	3·605
Preference Share.....	58,061,655	2,826,005	4·867
Loans	78,360,236	3,548,451	4·528
Total	314,989,826	12,812,544	4·068

III.—*Reduction of Interest on Loans and Preference Share Capital.*

On examination of the facts above reported, one of the most important considerations is the relative amount of Loans, Preference and Ordinary Share Capital. It is evident, that whatever the state of the money market, the lowest rate of Interest for the time will always be upon those instruments which afford the largest margin for the certain payment of the Interest and the repayment of the principal at the periods agreed on. Even on landed and house property, of which the average rental varies little from year to year, a higher rate of interest for Loans would be demanded by Capitalists who may be willing to lend so near the full value as to leave but a small margin to secure the punctual payment of their Interest. Much more is this likely to be the case when the annual income of the security offered depends upon the fluctuating profits of internal trade, or the foreign commercial prosperity of the country, and on the surplus income which the mass of the population may have to devote to travelling excursions for pleasure or health. We observe, then, that of the 314,989,826*l.* which was the total amount of money raised up to the end of 1857 for the construction of Railways, 78,360,236*l.*, or 25 per cent., formed, in the shape of Loans, a first charge on the profits of the Companies. The total profits from all Railways in 1857 appear to have been 12,812,544*l.*, and the Interest upon Debentures and Loans 3,548,451*l.*; thus leaving a margin of 9,264,093*l.*, or 72·3 per cent. of net profits to secure the punctual payment of this Interest.

Under such circumstances what can be the cause that the average rate of interest on Loans so secured should be as high as 4·52 per cent. in 1857, and that in the most favourable year, 1853, it never fell below, on an average, 4·14 per cent.? What again could be the cause that the rate of interest on these securities has gone on increasing in successive years till 1856, though the rate of interest on ordinary Share Capital had rather increased than diminished? In 1857, it is true, the rate of interest on this class of securities fell

to 4·52 per cent., but the rate of dividend on Ordinary Share Capital had increased to 3·6 per cent. Looking at the very large surplus which remains, and the ample security thereby afforded for punctual payment of the Interest, there seems no reason to doubt that such Loans should be considered nearly equal to Government Securities. Unless some new system of locomotion could be devised with which the existing Railways were unable to compete, either in facilities or in economy of working—unless the ruin was so complete that more than 9¼*l.* millions per annum out of 12$\frac{8}{10}$*l.* millions—the present profits —should be entirely swept away, the rate of interest charged upon these Loans could be duly paid. There are few investments in land or house property which afford such ample guarantee for payment of interest.

It may be contended, however, that if the Directors of Companies should, under any circumstances, decline the payment of interest, the remedies would be very difficult to enforce, and the realization of the Loan almost impossible. To this it may be answered, that as the probity of the country on which the punctual payment of the interest of the National Debt depends is represented by Parliament, so the honesty of that large portion of the public who are Investors in Railways is represented by the Directors they select to manage their affairs. Any repudiation of *bonâ fide* engagements would not merely tend to the disgrace of a Board, but would, in a financial point of view, be the ruin of the Company itself. The immense amount of Loans which have been raised, paid off, and renewed, since the formation of the Railway System is the best evidence to the public of the faithfulness with which such engagements have been and will be kept. When a Company's good faith is known and trusted, short Loans can always be paid off by raising new Loans at the current price of the day. Such Loans are usually agreed upon for a fixed period, and the amount of surplus capital of the country annually seeking investment, would be as readily deposited therein as in the public funds, provided parties were satisfied that they could as easily transfer or obtain temporary advances thereon if needed.

A suggestion has been made, and has recently been adverted to at the General Meeting of one of the Scotch Railway Companies, that all such Bonds and Obligations should be made *payable to bearer*, and transmissible from hand to hand, without expense or trouble. It was remarked that the Stamp Laws already gave such a power by the payment of four times the Stamp Duty charged on an Ordinary Bond. By such an arrangement with the Commissioners of Stamps, these Bonds would afford facilities for temporary Investments, bearing a fixed rate of Interest, and which, like Exchequer Bills, would be frequently resorted to by the public whilst waiting or looking out for a permanent employment of their spare capital,

The suggestion is well worthy of notice. The effect would be, no doubt, to diminish considerably the rate of interest at which such advances are made. As confidence became fully established, the security more generally known, and the large margin of income guaranteeing the payment of interest better understood, this class of Loans would probably not differ much in value, nor fluctuate much more in market price, than the Public Funds. A difference of half per cent. Interest on the existing Loans of 78*l.* millions would amount to 390,000*l.* per annum,—no mean advantage to the Ordinary Shareholders.

The next serious question is that of *Preference Shares*. In Captain Galton's Report, the amount of Preference Capital at the end of 1857 is given as 58,061,655*l.* the average Interest on which was stated at 2,826,005*l.*, or 4·867 per cent., whilst on the Ordinary Share Capital at the same period, of 178,587,935*l.* only 6,438,088*l.* was available for Dividends, or 3·605 per cent.

It is evident that Preference Shares coming after Debentures cannot be expected to be taken up by the public except at a higher rate of interest. Accordingly, in the last and most favourable period, where Debenture Capital pays only 4·528 per cent. the Preference Share Capital has to be raised at the cost of 4·867 per cent. Yet the amount of 58,061,655*l.* does not form a fourth part of the total Share Capital, and the Interest due thereon, 2,826,005*l.*, secured upon an Income of 9,264,093*l.*, leaves a margin of 6,438,088*l.* as guarantee for its punctual payment. If there were no Preference Shareholders, but all shared alike, the average dividend would be 3·914 per cent. Considering that the Ordinary Shareholders must always be liable to the fluctuations of commerce,—that depression of business, increase of expenses, unexpected accident, or any of the other incident of their trade, which the most careful foresight could not provide against, must first strike them,—it would seem but just that the margin of their average profits should be greater than that of the Preference Shareholders to place them in relatively as favourable a position. Whereas in many years they have not exceeded half, and in no case got beyond three-fourths, of the rate of Dividend accorded to Preference Shareholders.

The truth is, that the raising of Money, either by Debentures or by Preference Shares, is a false system, and always acts prejudicially to the Ordinary Shareholders, unless their annual dividends amount to at least the same rate per cent. on their Capital as they have to give on Debentures or Preference Shares. Thus, if they are not earning 4 per cent. it would clearly be a loss to them to have borrowed on Debentures at 4 per cent., and still worse, if at the same time they had issued Preference Shares on which they were paying 5 per cent. The only way in which the Ordinary Shareholder could

obtain his due share of the profits of the Railway would be to hold his share of each Stock in the exact proportions which they bear to the whole Capital paid up. To take an example from Captain Galton's Report for the year 1857, in which the Ordinary Capital of all Railways is represented as 57—the Preference Capital 18—and Debenture Capital 25 per cent. of the whole; the first bearing 3·60 per cent., the second 4·86 per cent., and the last 4·52 per cent.: if the Shareholder held 100*l.* in these proportions his average Income would be about 4·06 per cent., which is just the proportion that 12,812,544*l.*, the total profits for 1857 bears to 314,989,826*l.*, the whole Capital (Loan and Share) invested.

On the other hand, if the Ordinary Shareholder is obtaining a higher dividend than the rate at which Preference Capital can be borrowed, it is to his advantage to borrow it, securing for an addition to his Dividends any difference in the rate of Interest below the rate of Dividend. It is probable, that if this rule were strictly carried out, a much larger amount than the present Debenture and Preference Capital combined could be borrowed at much lower rates than the Debenture Capital alone on the system now pursued. The whole charge for 1857 would be but 136,421,891*l.*, and the Interest, if such Loans could be obtained at 4 per cent., would be but 5,456,876*l.*, secured upon an Income of 12,812,544*l.*, the present net profits of our Railways. The saving effected in favour of the Ordinary Shareholder would be no less than 917,580*l.* per annum.

IV.—*Reduction of Working Expenses.*

Whatever may be the amount of benefit to the Ordinary Shareholders resulting from the reduction of interest on Loans, it seems agreed on all hands that a considerable saving may yet be effected in the *Working Expenses* of Railways.

The Working Expenses of all the Lines of Railways in the United Kingdom averaged only 45 *per cent.* of the Total Receipts from 1849 to 1854, but in 1855 the proportion rose to 48 per cent., and in 1856 and 1857 was still as high as 47 per cent. The addition, however, of the average of the 3 per cent. in 1855 charged on the entire receipts for the year took away no less than 645,228*l.* from the Dividends of Ordinary Shareholders, and the 2 per cent. addition in 1857 deprived them of more than 483,492*l.* of their profits. Perhaps, on a careful examination of the causes of this increase, it might appear judicious and inevitable; but as the receipts from traffic steadily increased, and yet the expenses increased in a greater ratio, it is well worthy of a close investigation whether the rise was necessary and exceptional for the first development of new traffic, or whether it arose from want of vigilance of those who directed, or

want of skill on the part of the Officers entrusted with the expenditure.

This revision appears, however, to have commenced, for the proportion of working Expenses in 1857 to total receipts diminished in England, being 48 per cent. in 1857 compared with 49 per cent. in 1856; in Scotland it decreased 3 per cent.—from 44 in 1857 compared with 47 per cent. in 1856; and in Ireland it also decreased, being 38 per cent. in 1857 compared with 39 per cent. in 1856. It may also be remarked that the percentages in Scotland and Ireland are less than in 1855. It is probable that the smaller rate of diminution of expenditure in England and Wales, as compared with Scotland, may have arisen from a judicious and temporary outlay for the extension of some new branches of traffic, and if the latter be permanent and the former only an exceptional charge, the Shareholders will have no reason in the end to regret the difference. For some Railways no returns are given of the expenditure, and in others, in consequence of the Forms being different, it was necessary to be content with approximations only; but the Expenses ascertained on Railways in the United Kingdom, of which the Total receipts were 23,821,646*l.*, amounted to 11,240,239*l.*, and were thus subdivided:—

1857.	Actual Charges.	Per Cent.
	£	£
Maintenance of Way	1,752,322	15·51
Locomotive Expenses, including repairs of rolling stock	4,335,824	38·39
Traffic Charges	2,924,204	26·33
Miscellaneous Charges, including police, watchmen, compensations	1,429,116	12·67
Rates and Government Duty	798,773	7·10
	11,240,239	100·

Under which of these heads a careful inquiry by competent officers would lead to curtailment without diminution of efficiency, speed, or safety, it may be difficult to suggest; but that a considerable proportion of the large sum of nearly 11¼ millions might be converted into profits is not an unreasonable conjecture, when we examine the remarkable diversity on the percentage of working Expenses to Receipts on the different Lines. The hope is strengthened by the fact that Companies which have honestly and earnestly set to work with this object have succeeded in increasing their receipts at the same time that they were actually diminishing the cost of their traffic. It appears from a Report in the "Times" of the 10th September last that experiments, originally commenced on

the London and South Western Line, were being made on the Lancashire Lines for the substitution of coal for coke, by a process capable of being adapted, at little cost, to the Engines in use. The experiments gave promise of success, and it was computed that the Cost would be reduced one-half, and that the Saving on 400 miles of Railway only would be equivalent to 30,000*l.* per annum.

In the return so often referred to a comparison is given of the proportion per cent. of Expenditure to Receipts for each Railway for 1855 and 1856, by which it appears, that whilst some exceed 70 per cent., others fall below 40 per cent. If all the Companies there recorded, whose working Expenses are above the Average, viz., 47 per cent., could, by care, vigilance, or the expedients already adopted, have reduced their charges to the present average, the total Savings upon their receipts in 1857 would have fallen not far short of half a million sterling, which would consequently have added that amount to the Dividends of the Ordinary Shareholders.

We shall probably be told that the Managers of Companies are always intent, and have been for many years past, on reducing the expenditure to the lowest point of economy consistent with safety and efficiency. Yet we do find, that when pressure is brought to bear from without,—when the patience of Shareholders, reduced to extremity by diminishing Dividends, or roused by some startling disclosures, is turned into indignant remonstrance or keen inquiry, some methods are found of getting nearer to the average, and of converting waste into profit and recklessness into care. Whilst some Companies differ 30 per cent. in their Expenditure on the receipts from others, we shall not abandon the hope that something yet remains to be done, and that whatever is done under judicious and competent advice will better the position of the Ordinary Shareholders.

V.—*Increase of Traffic Receipts.*

Notwithstanding the varying circumstances of the country, and periods of Commercial depression, the Traffic receipts on Railways have made steady progress for several years. For 1849, 1850, 1851, and 1852, they fluctuated, varying on the whole Railways of the United Kingdom from 2,086*l.* to 2,220*l.* per mile, or from 5·91 to 6·33 per cent. on the Capital raised; but from 1852 to 1856 inclusive, the advance was continuous in the traffic receipts from Passengers and Goods combined, whilst from Goods alone the increase per mile rose in each successive year from 990*l.* in 1849 to 1,530*l.* in 1856. The year 1857 very nearly corresponds, under each head, with 1856. The total receipts in 1857 were, from Passengers, 10,592,800*l.*, and from Goods 13,581,811*l.* Total, 24,174,611*l.* As regards the *Passenger* traffic, the average fares for all Classes of

Passengers combined have been slightly reduced from 1·30*d.* in 1852 to 1·25*d.* in 1857 per mile on an average for each Passenger, and the average receipts per mile since 1852 have increased from 1,091*l.* to 1,191*l.* The principal reduction in the fare has been from first class Passengers, and throughout this period the average receipts per passenger have diminished from 20·40*d.* to 17·92*d.*, thus showing that an increasing number of Passengers have travelled a shorter distance each. The following Table shows for 1857 the total Receipts and the average fare per mile and per passenger for each class.

In 1857.	Number of Passengers.	Per Cent.	Receipts.	Per Cent.	Average Fare *per Mile* for each Passenger.	Average Receipts per *Passenger.*
			£		*d.*	*d.*
First Class	18,606,826	13·38	3,167,468	29·90	1·97	35·48
Second Class	42,166,285	30·38	3,574,988	33·75	1·41	20·34
Third Class and Parliamentary	78,198,129	56·21	3,637,218	34·34	·88	11·16
Mixed, or not duly apportioned into classes, season ticket holders, and excess fares	37,648	·03	213,124	2·01	....	....
Total	139,008,888	100.	10,592,798	100·	1·25	17·92

The proportion of the number of *First Class* Passengers conveyed to the total number has *increased* from 11·42 in 1849 to 13·38 per cent. in 1857, but the *Second Class* has *decreased* from 36·84 to 30·38 per cent. whilst the *Third Class* has *increased* from 51·52 to 56·21 per cent. in the same period. The proportion of receipts from First Class Passengers to the total receipts has not varied much from year to year since 1849; but the Second Class has diminished in the same period from 40·31 to 33·75 per cent.; whilst the Third Class has increased from 28·93 to 34·34 per cent.

This evidently points out to which class of passengers the attention of Traffic Managers ought to be directed, and how large an increase may be expected when still greater facilities are offered for travelling short distances at low fares.

It is, however, in the *Goods traffic* that the greatest increase has been effected, and it is worthy of remark, that whilst the passenger receipts have increased from 6,277,892*l.* in 1849 to 10,592,798*l.* in 1857, or 68·73 per cent., the Goods traffic has increased from 5,528,606*l.* to 13,581,812*l.*, or 145·66 per cent. in the same period. In 1849 the Passenger traffic was 53·17, and the Goods traffic 46·83 per cent. of the whole, but in 1857 the proportions were more than reversed, the former being only 43·82 and the latter 56·18 per cent.

That an increase of nearly 1,007,000*l.* per annum should go on continuously for eight years affords the most favourable hopes that the internal commerce of the country will still further improve as facilities of conveyance are increased, whilst the addition of new branch lines constructed at a cheap cost, (scarcely exceeding, as it appears, on an average one-fourth of the Cost of the Original Lines), constantly opens up new districts for the interchange of productions and the enterprise of trade. It is no slight triumph of the Railway System to record, that in the year 1857 alone, about 139,000,000 passengers (besides Season Ticket holders) were carried on an average 13·2 miles each at an average cost of about 1¼*d.* per mile; that 25,027,927 tons of Merchandize, 46,293,984 tons of Minerals, and 11,047,160 Heads of Live Stock were conveyed by 1,140,028 Goods Trains; and besides all this, that the sum of 1,295,420*l.* was paid for the carriage of parcels, and other miscellaneous traffic. From the Traffic Returns of Railways made to the Board of Trade and presented to both Houses of Parliament by command of Her Majesty, I have prepared the following interesting Tables (D), (E), (F), and (G), showing a comparison for the years 1856 and 1857, and deduced the average results from each class of facts.

(D.)—Summary *of* Traffic *upon all the Railways in the* United Kingdom *for the Years* 1856 *and* 1857.

Results.	1857.	1856.
(I.)		
Miles open at the *beginning* of the year	8,708	8,296
,, *end* of the year	9,095	8,708
(II.)		
Number of Passengers:—		
First Class	18,607,000	17,117,000
Second Class	42,166,000	40,666,000
Third Class	23,300,000	21,930,000
Parliamentary Class	54,898,000	49,602,000
Total Passengers	138,971,000	129,315,000
Holders of Season and Periodical Tickets	37,600	32,400
(III.)		
Passengers' *luggage* on which a charge is made:—		
In 1856 second half year only given, therefore doubled *tons*	14,800	12,500
Parcels No.	8,686,000	8,043,000
Carriages ,,	56,800	49,500
Horses ,,	234,500	225,800
Dogs ,,	291,800	267,000

(D.)—*Contd.*—Summary *of* Traffic *in the United Kingdom.*

Results.	1857.	1856.
(IV.)		
Miles travelled by Passengers:—		
First Class No.	354,250,000	340,927,000
Second Class ,,	559,339,000	538,599,000
Third Class ,,	260,514,000	265,935,000
Parliamentary Class ,,	664,018,000	676,588,000
Total* ,,	1,838,151,000	1,822,049,000
(V.)		
Number of Passenger Trains ,,	1,966,000	1,824,000
Miles travelled by Passenger Trains ,,	44,837,000	41,479,000
(VI.)		
General Merchandize *tons*	25,028,000	23,824,000
(VII.)		
Minerals.—Coal ,,	34,983,000	32,882,000
Other Minerals ,,	11,311,000	8,057,000
Total	46,294,000	40,939,000
(VIII.)		
Live Stock.—Cattle *heads*	2,366,000	2,012,000
Sheep ,,	7,090,000	6,891,000
Pigs ,,	1,591,000	1,548,000
Total†	11,047,000	10,451,000
(IX.)		
Number of *Goods* Trains No.	1,140,000	1,081,000
Miles travelled by *Goods* Trains ,,	38,622,000	36,539,000

* In 1857, 26,318,000 miles non-classified, distributed in proportion to the second half year of 1856.

† The "non-classified" being distributed in proportion to the quantities or numbers classed.

(E.)—Railway *Traffic*, 1856-7.—Averages *deduced from the preceding Table* (D).

Results.	1857.	1856.	Increase in Actual Amount over 1856.
(I.)			Per cent.
Average number of Miles opened	8,902	8,502	4·7
	Per cent.	Per cent.	
First Class Pass., proportion to total number	13·4	13·2	8·7
Second Class ,, ,, ,, ...	30·3	31·5	3·7
Third Class ,, ,, ,, ...	16·8	17·	6·25
Parliamentary ,, ,, ...	39·5	38·3	10·7
Total {1856 .... 129,315,196 / 1857 .... 138,971,240}	100·	100·	7·5
Average number of Passengers per mile	15,611	15,210	2·6
Season Ticket holders, &c. per mile	4·23	3·80	16·2
(II.)			
Passengers' *Luggage* charged, average number of tons per mile	1·66	1·46	18·7
Number of Parcels, per mile	9·76	9·46	8·
,, Carriages ,,	6·38	5·82	14·8
,, Horses ,,	26·1	26·6	3·
,, Dogs ,,	32·8	31·5	9·
(III.)			
Average number of Miles travelled per Passenger:—			
First Class	19·	19·9	....
Second Class	13·3	13·3	....
Third Class	11·2	12·1	....
Parliamentary	12·1	13·6	....
Total	13·2	14·1	....
(IV.)			
Number of *Passenger Trains*	1,965,703	1,824,058	7·8
Average number of Miles travelled by each Passenger Train	22·8	22·7	8·1
Average number of Passengers to each Passenger Train	70·7	70·9	....
(V.)			
General Merchandize, proportion of total, tons	35·1	36·8	5·1
Coals	49·	50·8	6·4
Other Minerals	15·9	12·4	40·4
Total {1856 .... 64,762,605 tons / 1857 .... 71,321,911 ,,}	100·	100·	10·1
(VI.)			
Cattle, proportion of total Live Stock, heads	21·4	19·3	17·6
Sheep ,, ,, ,, ,,	64·2	65·9	2·9
Pigs ,, ,, ,, ,,	14·4	14·8	2·8
Total {1856 .... 10,450,625 heads / 1857 .... 11,047,160 ,,}	100·	100·	5·7

(E.)—*Contd.*—Averages *deduced from the preceding Table* (D).

Results.	1857.	1856.	Increase in Actual Amount over 1856.
(VII.)			Per cent.
Goods Trains	1,140,028	1,080,817	5·5
Miles travelled by ditto	38,622,186	36,538,870	5·7
Average number of Miles travelled by each	33·9	33·8	....
,, of tons carried by each	62·6	59·9	....
,, heads of Live Stock carried by each	9·7	9·7	....

(F.)—Money Results *of the* Traffic *upon all the* Railways *of the* United Kingdom *for the Years* 1856 *and* 1857 (*to the nearest* £100.)

Results.	1857.	1856.
(I.)	£	£
Receipts from Passengers:—		
First Class	3,167,500	2,992,200
Second Class	3,575,000	3,439,000
Third Class	899,400	861,700
Parliamentary Class	2,737,800	2,650,600
Holders of Season and Periodical Tickets	205,700	200,700
Excess Fares	7,400	9,600
Total Receipts from Passengers	10,592,800	10,153,800
(II.)		
Receipts from Passengers' Luggage	29,800	32,400
,, Parcels	585,100	543,300
,, Carriages	55,100	48,300
,, Horses	167,400	170,900
,, Dogs	15,000	13,700
Total	852,400	808,600
,, Mails	443,000	413,900
Total Receipts from Passengers, Passengers' Luggage, Parcels, and Mails	11,888,200	11,376,300
(III.)		
General Merchandize	7,781,700	7,685,400
Minerals.—Coal	3,050,700	2,737,900
Other Minerals	936,600	848,100
Total	3,987,300	3,586,000
Live Stock.—Cattle	295,400	265,600
Sheep	159,000	183,500
Pigs	63,000	68,700
Total	517,400	517,800
Total from General Merchandize, Minerals, and Live Stock	12,286,400	11,789,200
(IV.)		
Total Receipts from all sources of Traffic	24,174,600	23,165,500

(G.)—*Railway Traffic.*—AVERAGES *deduced from the preceding Table* (F). (*Money Results*).

Results.	1857.	1856.	Increase in Actual Amount over 1856.
(I.)			
Proportion to Total Receipts:—	Per cent.	Per cent.	Per cent.
First Class	30·5	30·1	5·9
Second Class	34·4	34·5	4·0
Third Class	8·7	8·7	4·4
Parliamentary	26·4	26·7	3·3
Total { 1856 .... £9,943,372 / 1857 .... £10,379,675 }	100·	100·	4·4
Season Tickets, &c.	1·9	2·	2·5
	£	£	
Total, including above and Excess Fares	10,592,800	10,153,745	4·3
(II.)			
Average Fare paid by each Passenger:—			
First Class	·170	·175	....
Second Class	·085	·085	....
Third Class	·039	·039	....
Parliamentary	·050	·053	....
All the above Classes	·075	·077	....
Season or Periodical Ticket holders	5·465	6·195	....
(III.)			
Average Fare for each Passenger per Mile:—			
First Class	·0089	·0088	....
Second Class	·0064	·0064	....
Third Class	·0035	·0032	....
Parliamentary	·0041	·0039	....
All the above Classes	·0056	·0055	....
(IV.)			
Average Receipts per Passenger Train	5·389	5·567	....
,, Mile run	·236	·245	....
(V.)			
Average Receipts per cent. of Total *Passenger Traffic*:—	Per cent.	Per cent.	Per cent.
A. Passengers	89·11	89·26	4·3
B. Passengers' Luggage	·25	·28	8·0
C. Parcels	4·92	4·78	7·7
D. Carriages	·46	·42	14·0
E. Horses	1·41	1·50	2·1
F. Dogs	·13	·12	9·1
Total B. to F.	7·17	7·10	5·4
G. Mails	3·72	3·64	7·0
Total Passenger Traffic { 1856 .... £11,376,337 / 1857 .... £11,888,220 }	100·	100·	4·5

(G.)—*Contd.*—AVERAGES *deduced from the preceding Table* (F).

Results.	1857.	1856.	Increase in Actual Amount over 1856.
(VI.)	£	£	
Passengers' Luggage, average charge per tn.	2·01	2·6	....
Parcels ,, for each	·067	·067	....
Carriages ,, ,,	·969	·976	....
Horses ,, ,,	·720	·757	....
Dogs ,, ,,	·051	·051	....
(VII.)	Per cent.	Per cent.	Per cent.
General Merchandize, proportion per cent. of Total Goods Traffic	63·34	65·19	1·2
Coals	24·83 } 32·45	23·23 } 30·42	11·4
Other Minerals	7·62 }	7·19 }	10·4
Cattle	2·41	2·25	11·2
Sheep	1·29 } 4·21	1·56 } 4·39	13·4
Pigs	0·51 }	0·58 }	8·3
Total Goods Traffic { 1856 £10,450,625 / 1857 £11,047,160 }	100·	100·	....
(VIII.)	£	£	
General Merchandize, average paid for *conveyance* ..... per ton	·311	·323	....
Coals ..... ,,	·087	·083	....
Other Minerals ..... ,,	·083	·105	....
Cattle ..... per head	·125	·132	....
Sheep ..... ,,	·022	·027	....
Pigs ..... ,,	·038	·044	....
(IX.)	£	£	
Average Receipts for each *Goods* Train	10·8	10·9	....
,, for each Mile run by *Goods* Train	·318	·323	....
(X.)	Per cent.	Per cent.	Per cent.
Proportion of Receipts from Passenger Traffic	43·82	43·82	4·5
Proportion of Passengers' Luggage, Parcels, Carriages, Horses, and Dogs	5·36	5·28	5·9
Proportion of Goods Traffic	50·82	50·89	4·2
Total Traffic { 1856 .... £23,165,493 / 1857 .... £24,174,611 }	100·	100·	4·4

The following important Table of the average weekly Traffic on all the Railways of the United Kingdom during the Seven Years 1852-8 is obtained from the well known railway periodical "Herepath's Journal." The gradual increase of the Traffic is satisfactory.

(II.)—Railways.—United Kingdom, 1852-8.—Average Total Traffic per Mile per Week *during each* Month *of the Seven Years*, 1852-8. *Compiled from a Table inserted in "Herepath's Railway Journal," for 1st January, 1859, as specially prepared for that Journal by Mr. J. T. Hackett.*

Weeks Ended.	'58.	'57.	'56.	'55.	'54.	'53.	'52.
	£	£	£	£	£	£	£
Jany. 2	45	47	46	44	38	40	38
,, 9	44	46	46	44	38	40	37
,, 16	44	47	47	43	42	40	36
,, 23	45	47	46	42	44	41	37
,, 30	45	47	47	42	44	41	38
Feby. 6	44	46	46	41	44	39	37
,, 13	44	46	44	39	44	38	37
,, 20	44	46	44	39	44	37	37
,, 27	45	46	45	42	45	39	38
March 6	43	48	48	45	46	41	38
,, 13	43	47	47	45	46	42	38
,, 20	45	47	48	45	46	43	39
,, 27	47	48	49	45	47	44	39
Average for First Quarter	44	47	46	43	44	40	38
April 3	48	49	50	50	49	44	40
,, 10	47	51	50	50	51	45	42
,, 17	48	51	50	51	51	45	42
,, 24	49	52	54	51	49	45	42
May 1	49	52	51	51	49	46	42
,, 8	50	53	53	50	50	47	43
,, 15	49	52	55	50	50	51	42
,, 22	52	53	54	53	50	50	42
,, 29	55	56	56	55	53	51	44
June 5	52	60	55	52	55	49	47
,, 12	51	55	55	52	52	50	43
,, 19	53	58	57	54	54	51	44
,, 26	53	58	58	56	54	51	46
Average for Second Quarter	50	54	54	52	51	48	43

(II.)—*Contd.*—Average Total Traffic *during the Seven Years* 1852-8.

Weeks Ended.	'58.	'57.	'56.	'55.	'54.	'53.	'52.
	£	£	£	£	£	£	£
July 3	53	57	58	55	53	51	46
,, 10	53	56	57	56	54	53	46
,, 17	55	58	58	55	56	53	47
,, 24	57	59	60	56	56	55	46
,, 31	58	61	61	60	58	57	48
August 7	59	61	61	59	58	59	50
,, 14	58	60	60	60	58	58	50
,, 21	57	59	59	58	57	56	50
,, 28	57	60	59	59	57	55	50
Sept. 4	57	60	60	59	56	55	50
,, 11	57	58	60	58	55	55	49
,, 18	57	60	60	58	53	54	48
,, 25	56	59	59	59	54	53	48
Average for Third Quarter	56	59	59	58	60	55	48
Octr. 2	57	59	59	59	55	52	48
,, 9	55	57	58	57	54	51	47
,, 16	54	56	57	57	52	50	47
,, 23	53	55	56	54	51	48	46
,, 30	52	54	54	52	51	47	44
Novr. 6	50	51	52	51	50	46	43
,, 13	49	49	51	52	47	45	41
,, 20	48	48	50	50	46	44	43
,, 27	48	47	50	50	46	43	40
Decr. 4	48	46	48	49	46	44	39
,, 11	48	46	48	50	47	44	40
,, 18	48	48	51	53	52	49	41
,, 25	50	49	52	51	48	45	44
Average for Fourth Quarter	51	51	53	53	50	47	43
Average for Year	51	53	53	51	50	48	43

VI.—*Cessation of Competition.*

In most of the Reports of Railways, great or small, which have been recently made, and in the addresses of the Chairmen of Companies, constant allusion occurs to the injurious effects of competition on the receipts and profits of the various lines. What could induce Boards of Railway Directors to persist in a course which can only end in ruin or in serious injury to the Interests of Shareholders in each Company it is impossible to conceive. Traffic diverted from its proper channel by a reduction of prices, which cannot be permanently maintained, will only flow back again when the necessities of the competing Companies compel them to raise the fares to the natural standard, at which the passengers or goods can be carried at a profit.

In the mean time the Public are gaining at the expense of both sets of Shareholders, and probably are ungrateful enough to think that they are hardly treated when fair remunerative prices are again demanded. There seems, indeed, some reason for this opinion on the part of the public, for who would imagine that several public bodies, governed by men of the highest reputation for integrity, judgment, and knowledge of business, could go on for many years indulging in the most expensive litigation, constructing lines which cannot pay when the opposition ceases, reducing the fares for the conveyance of goods and passengers to rates which tend to the ruin of each other, supporting new schemes with no object in view but to damage their neighbours, the one giving no facilities for traffic which the other might bring to their line, and all this whilst by co-operating in a friendly spirit there would be ample profit for each, and whilst capital sunk in a useless warfare might have been advantageously employed in developing the traffic by which each could gain. The public may be excused for disbelieving that such a senseless course could be long pursued, and for believing that the low fares to which they are accustomed are only what the Companies can afford with profit to themselves, and may justly consider they have a right to grumble when the fares are raised.

The public, however, if they knew the fact of the competition, and of the cost at which it is carried on, would be as wrong to encourage it as the Shareholders are to endure it; for when the opposing Companies combine and make up their differences, it must be with a view of making the public pay handsomely for the losses they have incurred. In this sense, though the prospects of Original Shareholders are greatly improved by the Resolutions passed at the Meeting of the Directors and Representatives of Railway Companies, held at the Euston Hotel on 9th September last, 1858, it bodes but little good to the Commercial or travelling part of the Community.

One of the most prominent resolutions was, that the whole of the Railway Companies should unite to fix such rates and fares as will realise the largest amount of net profits, and though the phrase is added "with due regard to the interests of the public," it is very questionable what is the meaning to be attached thereto. What the Managers of Railway Companies may consider the Interests of the public, and what the public themselves may understand by the word, may be widely different. But if the phrase be fairly interpreted in favour of the community, the other Resolutions agreed to, (though it appears with different degrees of harmony) will, if they can be carried out, alter most materially the condition of Shareholders in British Railways, and convert what has hitherto been a property of doubtful and ruinous character into one of the most safe and improving Investments in the Kingdom. The purport of the other resolutions was, that if two or more Companies differ as to rates the question should be referred to arbitration,—that if there are two or more routes between two points, the rates, fares, and charges should be equal,—that all differences should be settled by arbitration, instead of the costly process of law, or the still more ruinous process of competition,—that powers should be sought from Parliament to enable two or more Railways to settle all disputes by arbitration; and finally a Committee was appointed to prepare a Bill, with power to add to their number, and to appoint an Executive Sub-Committee. The Chairman, who was also the Chairman of the North-Eastern Railway, and who was awarded the thanks of the meeting for originating, and for the energy and ability with which he had promoted the objects of the Meeting, stated that he had received Assents to the Resolutions of a previous Meeting, held 10th August last, from 18 Companies, representing 150*l.* Millions of Capital. The principal purport of the Resolutions was, that the rates and fares of the several Railways of the Kingdom should be so fixed as to realise the largest amount of net profits to the Companies entitled to them.

We should have been better pleased if the Resolutions had also given some pledge as to the reduction of the percentage of working expenses—as to arranging the times of arrival and departure of trains on different lines in concert with each other, so as to facilitate, instead of to interrupt, the continuous conveyance of passengers and goods throughout the whole of the United Kingdom; and what is of equal importance, that the Tribunal suggested should comprise some representatives on the part of the Public, so that they might not be wholly bound hand and foot and delivered over to be treated as captive by such a powerful Institution as (it has not been inaptly called by the "Times") the "Republic of Railways." Still some of these good effects may flow from the cessation of competition.

Railway Managers must be amenable in some degree to public opinion, and they will find their interest will always be to carry as large a number, at as great a rate of speed, and with as much safety and comfort as possible.

VII.—*Conclusion.*

These are some of the principal suggestions to improve the condition of the Railway Shareholder, or indications that a change has already commenced in his favour. The subject is too vast to be fully treated of in so small a compass as the limit of this Paper. Some of the evils, though recognized, can never be remedied, such as the large capital wasted in the first construction, the opposition of Landowners, by which the legislative expenses were so increased, the ignorance of the Owners of property, who foolishly imagined they were going to be ruined instead of greatly enhancing the value of their Estates, the partiality of Parliament, by which Lines were granted where they were not wanted, and refused where the natural course of the Traffic would have brought in large profits, or the recklessness of the Companies themselves, who have laid down lines to damage each other, which will have to be abandoned, or worked at a loss when the districts come to be divided by agreement. All these will be a dead weight upon the original Capital for ever. Mr. Stephenson computed that no less than 14*l.* Millions have been spent in Law proceedings, but what the cost of the other burdens alluded to may be, it is impossible accurately to ascertain.

Yet for all this, if the Loan, Preference, and Ordinary Share Capital be considered as One Interest, the results, though falling far short of the expectations entertained, give no occasion to despair of the future. A net profit of 12,812,544*l.* in 1857 on a Capital paid up of 314,989,826*l.* (Share and Loan) yields 4·067 per cent., and is a fair vantage ground for further progress. With a diminution in the rate of interest when the Debenture and Preference Share Capital is better understood under improved management, with a revision and reduction in some of the various sources of Expenditure, with constantly augmenting Traffic receipts, with a cessation of the fatal and senseless competition which has so long prevailed, with a tribunal for arbitration, which will save both legal expenses and the reckless opposition of the Companies amongst each other, with more regard to the convenience of the public in the arrangement of the trains, and with more attention to the comfort of third class Passengers, who are at present treated in a manner as disgraceful to Railway Directors, as the patience with which it is borne is creditable to the class of the community who travel thereby, and with some system to check the construction of unnecessary Lines, and to develop the commerce of districts by Officials

thoroughly versed in the resources they afford—there can be no reason for Railway Shareholders to give way to despondency, but rather to look with pride and satisfaction on a branch of commercial enterprise, the Capital embarked in which falls little short of 400*l.* Millions Sterling, and of which the net profits on the amount paid up exceeded last year half the Interest upon the permanent National Debt.

Appendix.

Comparative Financial Results of High and Low Railway Fares.

I avail myself with pleasure of the following important statement from "Herepath's Railway Journal," of 1st January, 1859:—

"The charge made by the largest American Railway Corporation (the New York Central) for travelling, is *two cents* per mile for a First class passenger, and *one cent* for a Second class.

"Compare this with our charges. We charge pence for cents, the one coin being about double the value of the other. Indeed our charges are more than double; for last year the average charge of all the railways in England was 2·01 pence per passenger per mile first class, and 1·41*d.* second class.

"Which fare pays better? In America the low fare yields 8 per cent. dividend; in England, the high one produces less than 5 per cent. This dividend result, however, it may be remarked, arises principally from the great difference in the capital cost of railways in the two countries. There is, however, evidence that in every place where it has been tried the moderate fare, as a general rule, is superior to the high fare as a means of producing profit, and enabling the traffic to increase. Thus in England (alone, not the United Kingdom), in 1852, the first class fare was 2·11*d.* per passenger per mile, and the amount of first class traffic per mile 379*l.*, while in 1857 the first class fare was reduced to 2·01*d.*, and the amount of first class traffic per mile became increased to 416*l.*; but how was it with respect to the second class English traffic, the fare of which, in the two periods, remained about the same, having been in 1852, 1·43*d.*, and in 1857, 1·41*d.*? The answer is, that the amount of traffic kept about the same as the fare. There was no sensible increase in the amount of English second class traffic. In 1852 it was 471*l.* per mile; in 1857, 476*l.* In Scotland we find the same results. There the first class fare was lowered, and the amount of money obtained from it was increased, while in the same country the second class fare was raised, and the second class amount of traffic receipts became less. In that country, in 1852, the second class fare was 1·51*d.*; in 1857, it was raised to 1·55*d.*; and the second class traffic in 1852 per mile, amounted to 177*l.*, while in 1857 it fell to 146*l.* per mile. Go we to Ireland, we find the same thing there also. In Ireland the first class fare was raised, and the first class traffic in amount remained about stationary, and so also with the second class traffic of that country; the first class fare was 1·72*d.* in 1852, amount of traffic per mile 150*l.*, while in 1857 1·81*d.* was the fare, and the amount of traffic 154*l.* The second class Irish fare was, in 1852, 1·31*d.*, amount of second class traffic, 215*l.*; in 1857, 1·35*d.* was the fare, and 234*l.* the amount of traffic. *There is hardly an exception to the rule that a high fare produces a low amount of traffic,* and stunts its growth, while a low or moderate fare collects a larger amount of traffic, and fosters increase. One of the best paying English railways charges the lowest fare, a fare even much lower than the American, and yet it is a dear line. The fact is, if a low fare will act as a great attraction for passenger traffic, it cannot fail to be highly profitable; even ½*d.* per passenger per mile is largely profitable, provided the passengers be considerable in number. Hence it is

that the English railway before alluded to—the North London—though charging the lowest fare—as low as ½*d.* first class—works at as low a cost in proportion to its traffic receipts as most English railways. The whole expenses of a passenger train capable of carrying 300 passengers cannot be more than 2*s.* per mile. Say that it carries 150 passengers at ½*d.* average fare, and we have a receipt of 6*s.* 3*d.* per train per mile, which will yield the handsome profit of 4*s.* 3*d.* per train per mile; or, say net, 3*s.* 6*d.*

"In the United Kingdom it is the *third class or cheap going traffic* that has increased so much. In 1852 the railway receipts from passengers averaged 1,074*l.* per mile; in 1857, 1,167*l.*, being an increase of 93*l.* per mile per annum, but of this 93*l.* increase, as much as 72*l.* was derived from third class passengers. The third class produced in 1852, 337*l.* per mile; in 1857, 409*l.*—increase 72*l.* This is an important fact bearing on the question of high or low fares. Of the three classes of traffic in this wealthy country—the first, the second, and the third—the third or poor class yields the largest return. The aggregate passenger receipt of 1,167*l.* in 1857 was made up by 356*l.* from first class passengers, 402*l.* from second class, and 409*l.* from the third. In 1852 the third class produced a *less* receipt than the first. The great mass of the population consists of poor people who cannot afford to pay high fares. The number being greater, there is a larger scope for increase in the third class department. But in the other classes, the rate of fare has evidently also an influence on the amount of traffic.

"It is likewise a significant fact, that since 1852 the dividends of British railways have increased greatly. In 1852 they averaged 2·40 per cent.; in 1853, 3·05; in 1854, 3·39; in 1855, 3·12; in 1856, 3·40; and in 1857, 3·60. 1857's dividends were exactly 50 per cent. more than 1852's.

"It would be absurd to adopt in any country one railway fare and that a very low one. The classification of traffic, as in this country, is requisite and excellent. And it might be absurd to reduce the high fares charged to some places. As a general rule, however, it is correct to infer that moderate fares produce most revenue."

On the Electoral Statistics *of* England and Wales, 1856-8.—Memorandum *with reference to certain portions of the* Paper *read in February,* 1858. *By* William Newmarch, *one of the Honorary Secretaries of the Statistical Society.*

Since the publication in the *Journal* of the 1st March last which contained the Paper read before the Society on the 15th February preceding, several circumstances have contributed to draw attention to the statements and estimates I had been led to adopt; and from a variety of quarters questions have been addressed to me with reference to various portions of the inquiry. I gladly avail myself, therefore, of the facilities afforded by the appearance of this ensuing number of the *Journal*, to state, as shortly as I can, the results of further investigation and evidence on some of the questions raised.

During the last few months a large group of returns has been issued by Parliament relative to the Constituencies and the Suffrage. It has not been possible to observe any systematic course of investigation in these Returns, and hence they are, to a great extent, desultory. Still the amount of new information is large and valuable, and if carefully analysed might afford the means for finally clearing away many difficulties. At present, however, I must content myself with referring to no more than one or two points.

Among the most important of the Parliamentary Papers are two (118/59 and 171/59) obtained by Mr. Tite, under the title of Poor Rates. The first of these (118/59), gives for each County Division (and the represented places within it) in England and Wales the number of persons assessed in 1853 to Poor Rate, distinguishing the annual rateable values of the properties assessed into twenty-one classes; and the like classification is also extended to the tenements in respect of which the *owners* (instead of the occupiers) were rated. To some extent the Return is imperfect in consequence of parishes, among which are several large metropolitan parishes, having failed to send in the needful schedules. Notwithstanding these defects, however, the Return is among the most valuable that has appeared.

The second Return (171/59) is a publication, in a separate form, of so much of the materials of No. 118 as relate to Represented Cities and Boroughs *only*, but the figures given do not extend beyond the direct assessment of *Occupiers*, omitting the very large class of cases in which the *owners* are rated intead of the occupiers. Hence this second paper cannot be regarded as more than imperfectly collateral to the first.

But availing ourselves of the facts given in the Paper No. 118, we may expect to arrive, with some degree of accuracy as

regards the *Counties and Boroughs* (combined) of England and Wales, at the total number of properties, the *rateable annual value* of which is represented by the scales of rateable annual value composing the return, and by means of that rateable annual value we may approximate pretty closely to the annual letting value or rent. As a general rule (but with many local variations) the gross estimated Rent may be said to be about *one-sixth more* than the rateable annual value to the Poor Rate. Thus a rating of, say, 5*l.* would represent a rent of, say, 6*l.* In the following Table (BB) the ratings are so arranged as to indicate, as far as possible, the three classes of *House Rents* of:—(B) 10*l.* and above;—(C) 6*l.* and under 10*l.*;—and (D) under 6*l.*

(BB.)—England and Wales.—*Counties and Boroughs*, 1853. Persons *assessed to* Poor Rate (*per Parl. Paper* 118/59, *Mr. Tite*), *in respect of* Properties *rated at the several Annual Values as under; and also the number of Tenements rated* (*not to the Occupiers*) *but to the* Owners *thereof.*

1	2	3	4	5	6
Counties and Boroughs (England and Wales) Rateable Values.	Occupiers Rated, 1853.		Tenements Rated to *Owners*, 1853.		General Totals, (3 and 5.)
	No.	No.	No.	No.	
(B) £10 *Rent and upwds.*					
£50 and upwards.....	272,000		1,000		
£10 and under £50....	711,000		22,000		
£ 9 ,, £10....	60,000		11,000		
£ 8 ,, £ 9....	81,000		19,000		
		1,124,000		53,000	1,177,000
(C) £6 *and under* £10 *Rent:*					
£7 and under £8.....	80,000		21,000		
£6 ,, £7.....	97,000		55,000		
£5 ,, £6.....	94,000		100,000		
		271,000		176,000	447,000
(D) *Under* £6 *Rent:*					
£4 and under £5.....	143,000		155,000		
£3 ,, £4.....	195,000		197,000		
£2 ,, £3.....	236,000		248,000		
£1 ,, £2.....	208,000		223,000		
Under £1.....	53,000		48,000		
		835,000		871,000	1,706,000
		2,230,000		1,100,000	3,330,000

One of the first observations to be made upon this Table is, that of the 447,000 assessments of 6*l.* and under 10*l.* Rent no less than 176,000, or 38 per cent., were assessments on Owners; and that of the 1,706,000 assessments under 6*l.* Rent considerably more than half

were also on Owners. We see also that the rents of properties *under* 6*l.* exceed in *number* all other rents of properties *above* 6*l.*

In order to convert the results in this general Table (BB) into some satisfactory estimate of the number of Parliamentary Votes which would be yielded by the three classes of Rents, a variety of corrections are required. The title of the Return 118/59 describes it as a Return of "the number of persons rated to the relief of the Poor "in respect of property of the Annual Value of ——." It is reasonable, therefore, to regard the return as in effect exhibiting the number of different *properties or tenements* (whether houses, stables, sheds, fields, workshops, offices, and the like), assessed in 1853. At present the franchise is conferred in Boroughs where there is occupancy of a *property or tenement* of the *bonâ fide* value of at least 10*l.* annual rent. The occupancy is not limited to dwelling houses, and the proposals which have been made from time to time for reducing the minimum limit have all proceeded upon the same principle of attaching the suffrage to the occupation of premises or tenements, be they dwelling-houses or properties of some other kind. To arrive, therefore, at an estimate of the number of votes to be yielded, we need *not* attempt any conversion of the rents of properties into rents of dwelling-houses merely.* But from the figures in (BB) *deductions* are obviously required on the following grounds, viz., (1) corrections as regards the number of female occupiers; (2) for properties vacant; (3) for occupiers absent; (4) for properties held by trustees or minors; (5) for properties held under lease or agreement for terms of insufficient length; (6) for occupiers receiving parochial relief; (7) for occupiers with more than one Parliamentary qualification in the same county or borough; (8) for occupiers who have not resided long enough to be entitled to a vote.

It is also clear that some *additions* are required to the figures in (BB) for:—(1) the omissions of certain entire parishes, as stated on the face of the return; (2) the further omissions which are inevitable in so large a collection of minute facts prepared by several thousands of parish officers in pursuance of an obligatory order which did not provide any special remuneration for the work to be done.

According to the best judgment I can form, an addition of 10 per

* There is frequently no little confusion in the minds of persons who discuss questions of reform, as to the real nature of the changes proposed, or to be considered. Household Suffrage, for example, is frequently confounded with Rating Suffrage—but is obviously a much less extensive proposal. A Household Suffrage would give votes to those adult males only who occupied dwelling-houses according to some definition to be given. A Rating Suffrage would extend to all adult males who were rated either for dwelling-houses or for *any other kind* of tenement; and special provision would have to be made for the more than one million occupiers whose rates are paid by the *Owners*, and whose occupancy is, in a large proportion of cases, a letting from week to week, with a week's rent paid in advance.

cent. in each of the three classes of rents, (B) (C) and (D), may be considered to raise the figures in the table just given to the approximate true totals; and *deductions* of 20 per cent. from the (B) rents; of 25 per cent. from the (C) rents; and of 33 per cent. from (D) rents; will reduce their true total to the extent required to provide fairly for the eight species of correction just pointed out.

These corrections are worked out in the following Table (CC); and in col. 7 of that Table I have inserted the Estimates which I was led to adopt (Table (M), page 118 *ante*) in the Paper of February last, as applicable to 1859. It must not be overlooked that the results in col. 6, obtained from the Parliamentary Paper 118/59 apply to the year 1853, and that the estimates in col. 7 apply to the year 1859.

(CC.)—ENGLAND AND WALES.—*Counties and Boroughs*, 1853. *Results founded upon Parl. Paper* 118/59 (*Mr. Tite*), *of the number of* Persons *assessed to Poor Rate in respect of Property* Rated *at various annual amounts; with collateral cols. designed to ascertain the number of* PARLIAMENTARY VOTES *in* 1853, *according to the Scales of Rents as under.*

1	2	3	4	5	6	7
Counties and Boroughs (England and Wales).	Poor Rate Assessments in 1853.					Estimate in 1859, (M *ante* p. 118.)
	Persons Assessed as per Return.	With 10 per cent. added for Omissions.	Deduct for Female Occupiers, &c.		Leaves Computed Votes in 1853.	
	No.	No.	Pr. ct.	No.	No.	No.
(A) Present Constituency, Counties and Boroughs....	....	....	....	....	....	934,000
(B) £10 Rent and above in Counties and Boroughs	1,177,000	1,294,000	20	260,000	1,034,000	1,042,000
(C) £6 and under £10 Rent	447,000	492,000	25	123,000	369,000	458,000
(D) Under £6 Rent.....	1,706,000	1,876,000	33	625,000	1,251,000	1,310,000
	3,330,000	3,662,000	23	1,008,000	2,654,000	2,810,000

Allowing for the lapse of six years, from 1853 to 1859, the figures in this Table (CC) afford considerable confirmation of the substantial soundness of the Estimates I put forward in February last—at least as regards the two classes (C) and (D) of smaller rents. In the case of the larger rents (B), that is of 10*l.* and above, *in Counties and Boroughs*, it is manifest that the estimate of 1,042,000 for 1859 is below the truth. The increase in six years has certainly far exceeded the difference between 1,034,000 and 1,042,000.

And this leads me to refer to a portion of the February Paper, to which some attention has been drawn, I mean to Table (G), at page 112 *ante*, in which an effort is made to ascertain the extent of the additions which would be made to the present County Constituency by reducing the County Occupation limit from 50*l.* to 10*l.* The conclusion I arrived at in February—but as then expressly stated on grounds largely conjectural—was, that the addition would be about 108,000 votes, or equal to 20 per cent. on the present County Constituency of 502,000 votes.

Looking, however, at the facts as now ascertained for 1853, as regards the Rents of 10*l.* and above, it is to my mind clear that the estimate for 1859 ought to be raised from 1,042,000 votes to *at least* 1,120,000 votes; or in other words, that the effect of the later and more complete evidence is to fully justify us in believing that a 10*l.* County Occupation limit would afford, say 186,000 votes to be added to the County Registers; raising, therefore, the total entries in these registers from, say 502,000 to 688,000 votes, or to the extent of 37 per cent.

I have been applied to from several quarters to explain the grounds upon which I adopted in Table (M), page 118 *ante*, a final statement of the County and Borough Constituencies at the three classes of rents, very much below the total numbers which might seem to be indicated by the statements in a territorial form, contained more especially in Tables (H) and (K):—and I will repeat here the answer I have given to these inquiries.

I attach so much importance to the Territorial arrangement that I spared no pains to complete the several Tables on that basis; and for groups of Counties taken in peculiar divisions or areas of country, I have great faith in the approximate accuracy of the cols. in (H) and (K). But when a general statement had to be made for the whole of England and Wales, I could not overlook a variety of considerations which must necessarily modify to a large extent the results afforded by the general rules which had alone been available for my guidance. It was clear, for example, that large allowances must be made:—(1) for varying proportions of female tenants in different parts of the country; (2) for wide variations of rating-valuation and practice; (3) for wide variations in the number of vacant houses arising from peculiarities of occupation; (4) and on the same ground for wide variations in the number of houses occupied for an insufficient length of time; (5) for disproportions in different parts of the country in the accuracy of the materials from which the final returns were made up. For these and other reasons which will readily occur to persons who have occupied themselves in reducing into a tabular form results not wholly ascertained by actual enume-

ration, I felt that the reduced totals contained in Table (M) would best guard both myself and my readers against errors of exaggeration.

In the former Papers I have given summaries of the schemes of reform as regards England and Wales effected in 1832, and proposed by Lord John Russell in February 1851, and by Mr. Bright in January of the present year. We may now add a similar outline of the scheme as regards England and Wales, proposed by Lord Derby's Cabinet in the Bill introduced by Mr. Disraelli on Monday, the 28th February last, namely:—

(1). *As regards Counties.*—(*a*) The present *freehold ownership* qualification of 40*s.* and upwards to remain as at present, but freeholds in Represented Cities and Boroughs to give votes for those Cities and Boroughs, and not (as at present) for the adjacent County; saving, however, the rights of all present holders of County Freehold Votes; and in order to check abuses, as regards Freehold Borough Votes to be held by non-residents prohibiting more than two votes in respect of the same "single tenement or individual plot of land."†

(*a*) The Copyhold and Leasehold qualification to be reduced from 10*l.* (as at present) to 5*l.*

(*b*) The *Occupation* County Suffrage to be reduced from 50*l.* to 10*l.*, subject to residence for a year prior to 24th June.

(*c*) Various improvements and simplifications of the present law as regards registration and payment of taxes and votes.

(2). *As regards Boroughs.*—(*d*). The Borough *Occupation* Suffrage of 10*l.* to remain as at present, thereby assimilating the Occupation Suffrage in Counties and Boroughs by fixing a minimum of 10*l.* in both.

(*e*) No interference with existing Freemen, Burgess, and Livery Votes.

(*f*) The same modification of Ratepaying and Registration Clauses as in Counties.

(*g*) The Enclosure Commissioners to revise the boundaries of Boroughs, so as to include within them any suburbs of recent growth.

(3). *New Suffrages for Counties and Boroughs.*—(*h*) Lodgers in apartments, furnished or unfurnished, at a rent of not less than 8*s.* per week or 20*l.* per annum.

(*i*) Persons deriving 10*l.* per annum, and above, from money invested in the Public Funds, or in East India or Bank of England Stock.

(*k*) Persons receiving Pensions of 20*l.* per annum, and above, from the Government or East India Company.

(*l*) Persons having a deposit of 60*l.*, or above, in a Savings' Bank in England or Wales.

(*m*) Persons being Graduates of any University of the United Kingdom; or Clergyman, Established or Dissenting; or Barristers, Attorneys, or Proctors; or Medical Practitioners under the Medical Act of 1858, or Schoolmasters holding the certificate of the Education Office.

(4). *As regards Transfer of Seats.*—(*n*) Fifteen seats to be obtained by withdrawing *one* Member from each of the following fifteen Boroughs at present sending *two* Members each, viz., Honiton, Thetford, Totness, Harwich, Evesham, Wells, Richmond, Marlborough, Leominster, Lymington, Ludlow, Andover, Tewkesbury, Maldon.

(*o*). These fifteen seats to be applied in giving *one* Member to each of the following seven places to be newly enfranchised as Boroughs, viz., West Bromwich, Birkenhead, Burnley, Staleybridge, Croydon, Gravesend, and Hartlepool.

(*p*) And the remaining eight seats to be applied in providing *two* Members each for *two* further County Divisions to be erected within the present West Riding of York; to *one* further County Division to be erected in South Lancashire, and to *one* further County Division to be erected in Middlesex.

(5). *As regards Voting Papers.*—(*q*) Votes in Cities and

* The Bill was introduced by Mr. Disraeli, on 28th February, 1859. The Second Reading was fixed for Monday, the 21st March. The Debate commenced on that day was extended over seven nights. The Division took place early on the morning of the 1st April, when the Resolution moved by Lord John Russell against the Bill was carried by 330 votes against 291—or by a majority of 39 in a House of 626—including Tellers and Speaker—a number only exceeded on one or two former occasions. The Division was analysed as follows: thus the *majority* was composed of Opposition members 327, usual Ministerialists 3, Tellers 2, making 332:—and the *minority* was composed of Ministerialists 259, usual Oppositionists 32, Tellers 2, making 293—or together 625. To this total has to be added for absent members, 7 Ministerialists, 17 Oppositionists, 4 Paired, Speaker 1, 4 for Sudbury and St. Alban's suspended—completing the 658 of which the House is composed when all the seats are full. Parliament was dissolved on Saturday, the 23rd April (the day after Good Friday), and most of the Elections took place in the following Easter week. Intelligence of the decisive ultimatum addressed by Austria to Piedmont reached London on Easter Tuesday.

† In six of the nineteen Counties Corporate (that is Cities and Towns which by Charter were Counties of themselves) the *freeholders* had gradually acquired a right of voting for the *Borough* member, and by a clause in the Reform Act this limitation of the Freehold Suffrage in these six places was continued. The places are Bristol, Lichfield, Nottingham, Norwich, Haverfordwest, and Exeter. In four of the Counties Corporate, viz., Canterbury, Poole, Southampton, and Ainsty of York, the freeholders therein voted for the adjacent county; but in the remaining *nine*, viz., Carmarthen, Chester, Coventry, Gloucester, Hull, Lincoln, London, Newcastle-on-Tyne, and Worcester, the freeholders therein, prior to the Reform Act, had no votes whatever either for the Borough or County members.

Boroughs to be allowed to be given by means of Voting Papers, according to regulations prescribed.

(*r*) Polling Places to be largely increased, and payment of the travelling expenses of voters to be prohibited.

The variety of the modes in which the Parliamentary franchise would be conferred under an Act fully embodying the scheme to which this outline applies render it almost impossible, in the absence of data specially collected for the purpose, to express more than a merely conjectural opinion as to the extent of the additions which would be made to the present County and Borough Constituencies of England and Wales.

The present number of Freehold County Votes within represented Cities and Boroughs may be taken at 100,000 votes. The Government Bill reserves the rights of the present holders of all these votes. The effect of reducing the County Occupancy limit from 50*l.* to 10*l.* would, as we have just endeavoured to show, place (say) 186,000 votes at the disposal of the County and Borough Registers; presuming the revision of Borough boundaries to be carried out.

To this large increase must be added the very considerable augmentation to arise from the clause enfranchising Lodgers paying 8*s.* per week or 20*l.* per annum. The additions under this clause would be most considerable in London and the largest Towns, for the obvious reason that in large Towns house-room is so dear as to compel the hiring of portions only of a house. According to the Census of 1851 there were in England and Wales 3,710,000 "*families*" occupying 3,270,000 *houses*, that is to say, each 100 houses contained very nearly 112 families,—equal in the aggregate to an excess of 440,000 families. Since 1851 this aggregate has largely increased, but to what extent, or to what portion of the present total the Eight Shilling test may apply, I have no accurate means of judging.

The Savings' Bank Clause, conferring votes on depositors of 60*l.* or above, would admit a desirable class of voters. In 1856, in England and Wales, out of 1,142,000 depositors in Savings' Banks 182,000 were for sums of 50*l.* and above; the returns do not admit of stating the proportion at 60*l.* and above. From this 182,000, large deductions must be made for females, minors, and trust and deceased accounts,—a deduction, taking the country as a whole, at least equal to one-third,—and allowing further for the higher range of the 60*l.* limit—reducing the 182,000 to probably not more than 80,000. Of this 80,000 a considerable number would of course possess votes under some of the other qualifying clauses.

The enfranchisement conferred on Government Pensioners of 20*l.* per annum and above, and on recipients of 10*l.* per annum and above from money in the Public Funds and East India and Bank Stock,

would no doubt admit some persons not already enfranchised as freeholders, occupiers, lodgers, or professional men. In 1857 there were 270,000 different recipients of dividends from the Public Funds of all kinds. Of this number 92,000 were recipients of annual sums of not more than 5*l.*,—and 43,000 of annual sums of more than 5*l.*, but not more than 10*l.* There were, therefore, 135,000 cases in which the payments conformed to the suggested limit of 10*l.* A large proportion of these 135,000 cases would of course be represented by females, trustees, minors, and absentees.

In 1851, in England and Wales, the following were the statements given as regards the number of Professional Persons (males 20 years and upwards).

Clergy, established or dissenting	26,000	Scientific persons	400
Barristers, solicitors, or other lawyers	15,400	Teachers	25,100
Physicians and surgeons	17,500		93,800
Authors	2,400		
Artists	7,000		

In these groups are no doubt included a very large majority of the adult persons holding the degrees of any British University. In 1856 the number of male persons holding certificates as Schoolmasters under the Council of Education was 2,900, and the number is yearly increasing. Nearly the whole of this class would be added to the register under the special clause in their behalf.

Considering the whole of the facts, and the extensive field so completely covered by the network of enfranchising clauses in the Government Scheme, and referring especially to the large operation of the Lodgers' qualification, it appears to me to be very probable that in the event of the plan becoming law it would, in the course of two or three years, increase the present County and Borough Constituencies in England and Wales to the extent of between Four and Five Hundred Thousand Votes.

Note—There has just been issued (Lords' Paper, 46/59) the Report and Evidence presented by the Select Committee of the Lords, obtained by Lord Grey in February last, to inquire into the effects produced on the Municipal Franchise by the operation of that portion of the Small Tenements Rating Act of 1850, which conferred the municipal franchise upon occupiers under 6*l.*, in the cases in which the rates were paid, not by the occupier, but by the *owner*. Under the Municipal Reform Act of 1835 the municipal franchise was acquired only by actual, direct, and continuous payment of rates for 2½ years. The Lords' Committee recommend an immediate return to that arrangement, on the grounds that the wide departure from it in 1850 is already producing the most serious disorder and corruption in municipal elections, is deteriorating the character of the persons returned as Town Councillors, and is leading to extravagance and mismanagement in the conduct of those bodies.

It may be added here, that according to a statement made by Lord John Russell a few days after the Division of 31st March last, a scheme of Reform according to his present views should provide for: (1) 10*l.* occupation limit in Counties: (2) 6*l.* in Boroughs: (3) *no* disfranchisement of Freemen:—and (4) the transfer of about 26 seats in England and Wales to larger places.

MISCELLANEA.

PARLIAMENTARY REPRESENTATION.—Mr. David Chadwick, the Treasurer of the Borough of Salford, and a gentleman of considerable reputation, has published a very interesting pamphlet intitled "*Suggestions for Effecting an Equitable Re-distribution* of *Members of Parliament on the basis* of *a Representative Claim deduced* from the *Population* and the *Annual Value of Property.*" (London: Smith, 184, Strand.) The details are worked out with great minuteness, and the general effect of the suggested scheme is stated by Mr. Chadwick himself in the following passage of his introduction.

"IN the plan now proposed, I take the present Annual Value of Property in each place, and the Population, as per Census of 1851, as given in the Parliamentary Return of last year.

"I suggest that 10,000 inhabitants and 50,000*l.* value of property should be the minimum claim to *one Member* of Parliament, and that 20,000 population and 100,000*l.* value of property should be the minimum claim to *two members.*

"In order that this principle may be easily applied to the whole of the constituencies, I have constructed a Table, giving the Representative Claim of from *one* to *seven* members.

"This Table is made up by taking a mean or composite number (reckoning the unit at 10,000) of the population and value of property in each place, as given in the Return Appendix No. 1.

"Thus, *Hereford,* Population 12,108, gives 1·2.
Property, £50,059, „ 5·0.

Showing a Composite Number or Representative claim of 6, the minimum estimated claim to one Member in the following Table.

Bedfordshire, Population of 112,785, gives 11·2.
Property, £517,621, „ 51·7.

Showing a Representative claim of 63, and it therefore would, according to the following Table, be entitled to three members:—

"TABLE *showing the* 'REPRESENTATIVE CLAIM' *to Members of Parliament, as applied to all Counties, Cities, and Boroughs.*

Population.	Annual Value of Property.	Representative Claim.	Number of Members.
	£		
If 10,000 and not exceeding 20,000	If 50,000 and under 100,000	6 under 12	1
If 50,000 and under 100,000	300,000	„ 40	2
„ 200,000	1,300,000	„ 150	3
„ 300,000	2,400,000	„ 270	4
„ 400,000	3,600,000	„ 400	5
„ 500,000	5,000,000	„ 550	6
above ditto	above ditto	above ditto	7

"*Note.*—All places giving a 'Representative Claim' of *less* than six are proposed to be disfranchised.

"The Return, No. 1 Appendix, shows the proposed Re-distribution of seats according to this scheme.

"Population and Property jointly, are taken as the real elements of Representation, in order that Taxation and Representation should, as far as practicable, and on a definite principle and proportion, coexist.

"The number of Houses in any case can be ascertained from the population with sufficient exactness by taking *six* persons to one house, in very large towns; *seven* persons to one house in London, Glasgow, and Edinburgh; and *five* persons to one house in all other cases.

"The Annual Value of Property given in the Return No. 1, includes all Land, Houses, Works, Railways, Canals, and other property assessed by the Government to the Property Tax, and by the Local authorities to the Poor Rates. It may be taken as a safer and better criterion than any other, not only of the extent of liability to contribute to the National Taxation, but also of the condition and intelligence of the people.

"The Elements of Representation having been thus ascertained, it is submitted, that the same amount of population and property, (jointly considered and so that a preponderance of one shall be allowed to compensate for a disparity of the other), should return the same number of Members to Parliament, whether in Counties, Cities, or Boroughs, in England, Ireland, Scotland, or Wales.

"The Return No. 2 Appendix, shows the Boroughs which under this plan would be disfranchised, and those where the number of Members would be *reduced.*

"The operation of this scheme, though at first sight rather alarming, by the large number of Boroughs it proposes to disfranchise, will be found, on careful examination, to be quite safe and practicable.

"Although by this plan the Counties would obtain a very large increase of Representation, they would not get an unequal advantage. At present, the large number of Members representing the small Boroughs proposed to be disfranchised, may be considered as County Members, or as representing the interest of a fractional portion of the Counties. It is evidently better to increase at once the Members for the whole County or Division, in proportion to its acknowledged claim, than to attempt to bolster up any longer the small Constituencies on the plea of peculiar claims, vested rights, or class interest.

"The plan now proposed is surely preferable to any scheme, however skilfully devised, which may attempt to keep up the present small Constituencies, by including the surrounding Villages within new Parliamentary boundaries.

"If the grouping of Villages within any given radius be allowable in any case, there are no districts in which that objectionable system cannot be applied: but there must be a limit, and when the area of a borough is extended many miles, or includes a group of Villages several miles apart, it would undoubtedly be better to extinguish the small Borough at once, and give a new *County* Member, whose usefulness and dignity would not be impaired by the reflection that he does not represent an average proportion of the people and property of the kingdom in the British Parliament.

"In conclusion, I refer to the tables and statements appended hereto as the best proof of the fairness, the moderation, and the practicability of the plan now proposed.

"The Return No. 3 gives a list of the proposed New Boroughs and Constituencies, and of those in which the number of Members is increased.

"The Return No. 4 gives a general view of the whole of the alterations now suggested.

"By this scheme the following would be the general result:—

"No. of Members taken from small Boroughs		201
Add for Sudbury and St. Albans, already disfranchised....		4
		205
No. of New Members added to Counties	133	
Ditto added to the present large Boroughs	60	
Ditto given to New Boroughs	12	
		205"

"General Society of Commercial and Industrial Credit," established at Paris, in March, 1858.

A new Commercial Company has been established at Paris, under Government sanction, with the title as above. It resembles very closely the *Crédit Mobilier*, and is generally described short, as the *Crédit Industriel*. The *Moniteur* gave the following statement relative to the New Company:—

"By the terms of the statutes the administration will consist of governors and directors named in the same form as the governors and directors of the Bank of France and of the Crédit Foncier. The capital of the society is fixed at 60,000,000 francs, divided into 120,000 shares of 500 francs each; 80,000 shares, or 40,000,000 francs, is reserved for the public subscription. This obligation, imposed by the Council of State to reserve 80,000 shares to the public subscription, is worthy of remark. The new society, constituted in order to fill up a void in our financial organization, will be empowered to open public subscriptions for all the great enterprises of utility, the home and foreign loans, &c. Until the homologation of the statutes, the constitution of the board of directors, and the nomination of the governor, the funds paid in by the subscribers will be deposited at the Caisse des Dépôts et Consignation, in conformity with the request of the Minister of Finance. During the subscription the books will be examined each day by an inspector of finance appointed for this purpose by the Minister. Each day there will be sent to the Minister of Finance a statement of the sums paid in. The allotment of shares subscribed for will not be made until after the lists of subscription and of allotment shall have been submitted to the Minister of Finance. This new institution, which will have the double character of an *intermédiaire* for commerce and for industry, would have been analogous to the Crédit Mobilier if its statutes had permitted it to speculate on the Bourse. But this power not being accorded to it, its shares have no fluctuating character, and offer as perfect a security as the operation of the Comptoir d'Escompte and of the Bank of France, with a greater latitude in favour of industry."

A copy of the following document was posted in March last on the London Stock Exchange, relative to the subscriptions which may be made in this country:—

"This society has been constituted by act passed before M. Dufour and his colleague, notaries in Paris, the 28th December last. The statutes have been examined by the Council of State. Social capital 60,000,000 f., divided into 120,000 shares of 500 f. each. First issue of 40,000,000 f. represented by 80,000 shares, upon which an instalment of 125 f. will be paid. The second issue of 20,000,000 f. will not be made until the authority of the Government has been received. The public subscription of the 80,000 shares to be issued is opened at Messrs. Donon, Aubry, Gautier, and Co., bankers, 44, Rue de la Victoire, Paris, until the 4th of April, at three o'clock. Each application must be accompanied by a deposit of 50 f. per share. The allotment of shares between the subscribers will be made *pro rata* after deduction of the 4,300 necessary for the qualification of the directors. The allotment will be made within ten days after the closing of the subscription. During this interval the subscribers will be required to pay 75 f., sum necessary to complete the 125 f. per share; provisional certificates (to bearer) will be delivered against this payment and the original receipt. Every subscription which has not been completed before the above date will be annulled, and the deposit money returned to the subscribers. Mr. C. W. Price, foreign and English stockbroker, having been authorized to take charge of English subscriptions in the above undertaking, will forward to the board in Paris any applications made to him before the 3rd April next."

The society is authorized to discount commercial bills payable in France and abroad, to make advances on warrants for goods, issued in conformity with the law of 28th May, 1858, and on commercial instruments generally; to make advances on French funds and the shares and bonds of industrial undertakings to the extent of two-thirds of the value in the market; but these bonds are not to be for a longer period than 90 days, nor to exceed in amount one-fifth of the paid-up capital plus one-half of the reserved fund. Advances may be made to French "Industrial" companies for a period of six months, with a like limitation as to aggregate amount. The society may make and receive payments of all kinds at home and abroad, open accounts current, and execute commission business in stocks and shares. Subject to the authorization of the Minister of Finance, it may open for account of third parties subscriptions to public loans and industrial undertakings. Another important feature is that the society may receive, in the shape of current accounts, a sum equal to 150 per cent. of its paid-up capital and reserved fund, and may allow interest upon such balances, the aggregate amount of which may be extended, with the approbation of the Government. The aggregate of deposits, bills current, and paper in circulation bearing the society's endorsement, is never to exceed six times the amount of paid-up capital and reserved fund. The liability of the shareholders is limited to the amount of shares held. The directors are to be twenty-two in number, and the president is to be named by the Emperor, but how much may be paid for the nomination is not, of course, intended to be revealed.

Naval Arsenal at Cherbourg.—A recent number of the *Revue des Deux Mondes* contains an interesting article on the Naval Arsenal at Cherbourg, from which it appears that the works have cost 7,611,000*l*. They are thus divided:

Periods.	Sea Works.	Fortifications and War Buildings.	Total.
	£	£	£
Ancient Monarchy, from 1783 to 1792	1,248,000	410,000	1,658,000
Republic, from 1793 to 1800	....	....	....
Consulate and the Empire, from 1801 to 31st March, 1814	1,176,000	359,000	1,535,000
Restoration, from 1st April, 1814, to 31st July, 1830	413,000	64,000	477,000
Government of July, from 1st August, 1830, to 24th February, 1848	1,626,000	339,000	1,965,000
Republic, 25th February, 1848, to 2nd December, 1852	644,000	116,000	760,000
Government of Napoleon III., from the 3rd December, 1852, to 31st December, 1857	1,038,000	178,000	1,216,000
	6,145,000	1,466,000	7,611,000

General Election, 1859, *and the Eight General Elections*, 1832-59.—Party Results.

In the *Standard* newspaper of the 21st May, 1859, a correspondent inserts an elaborate analysis of the results, in a party sense, of the General Election just concluded. Without entering into any of the personal or mere party inferences of the writer, we may avail ourselves of the two following Tables. In the *first*, a statement is given of the final result, of the Polls in forty-four Counties and Boroughs most hotly contested in April, 1859, and in March, 1857. The Table is formed on the principle of inserting the *highest* number of votes polled for a candidate on each side. In the *second* Table a statement is given of the party results at the close of each of the eight General Elections which have taken place from 1832 to 1859, distinguishing the several classes of County and Borough Constituencies. The following are the Tables:—

General Elections.—*March*, 1857, *and April*, 1859.—*Party Results in forty-four leading Contests, taking the highest polls on each side.*

Constituency.	Conservative.		Whig-Radical.		Constituency.	Conservative.		Whig-Radical.	
	1857.	1859.	1857.	1859.		1857.	1859.	1857.	1859.
Bedfordshire	1,374	2,030	1,564	1,832	Leicester	1,114	1,476	1,673	1,564
Berwick	269	366	339	330	Leith	701	902	821	746
Blackburn	509	832	846	750	Lewes	206	200	459	339
Bodmin	169	198	244	205	Limerick (County)	14	2,538	859	3,933
Bridgewater	203	230	330	290	Liskeard	124	160	174	164
Bristol	3,632	4,205	4,681	4,432	Londonderry (Co.)	2,404	2,627	2,339	1,758
					Lyme Regis	53	115	144	116
Carrickfergus	560	667	383	260					
Cheltenham	655	910	841	922	Maldon	405	503	427	431
Clare (County)	1,139	3,829	1,152	2,234	Mallow	52	63	108	53
Cork (City)	898	1,200	1,246	1,276					
Coventry	599	1,955	2,810	3,058	Newry	232	250	246	197
					Norwich	1,636	1,954	2,247	2,151
Dartmouth	93	116	126	116					
Derbyshire (South)	2,105	3,185	3,922	3,536	Plymouth	622	1,153	1,167	1,636
Devizes	159	171	230	148	Poole	98	143	211	203
Dover	695	931	989	788	Preston	1,433	1,542	1,503	1,538
Essex (South)	2,332	2,846	2,119	2,185	Roscommon	523	1,226	985	1,634
Frome	72	194	162	147	Stockport	557	594	834	769
Galway	262	743	448	646	Taunton	401	407	442	383
					Truro	263	303	267	225
Hull	1,392	2,260	2,365	2,440					
Hants	1,192	1,403	1,106	1,069	Wexford (County)	2,522	3,026	4,303	4,003
					Wigan	308	500	493	476
Kidderminster	146	208	234	217	Winchester	385	403	397	348
Kent (West)	3,171	3,769	3,896	3,584					
					Yarmouth	521	691	609	537

The Eight General Elections, 1832-59.—*Party Results at close of each, according to the Politics of the Members declared Elected.*

Constituencies.	1832.			1835.			1837.			1841.		
	Cons.	Lib. Cons.	Lib.	Cons.	Lib. Cons.	Lib.	Cons.	Lib. Cons.	Lib.	Cons.	Lib. Cons.	Lib.
English *Boros.*	82	2	243	132	4	191	142	3	182	150	9	168
„ Counties	38	....	106	71	2	71	100	....	44	120	6	18
Welsh *Boros.*	4	....	10	5	1	8	6	....	8	7	....	7
„ Counties	8	....	7	11	....	4	11	1	3	11	1	3
Scotch *Boros.*	2	....	21	....	....	23	1	....	22	1	....	22
„ Counties	7	....	23	15	....	15	18	....	12	19	2	9
Irish *Boros.*	13	....	28	14	....	27	11	1	29	16	1	24
„ Counties	18	....	46	23	....	41	21	....	43	26	....	38
	172	2	484	271	7	380	310	5	343	350	19	289

Constituencies.	1847.			1852.			1857.			1859.		
	Cons.	Lib. Cons.	Lib.	Cons.	Lib. Cons	Lib.	Cons.	Lib. Cons.	Lib.	Cons	Lib. Cons.	Lib.
English *Boros.*	77	60	188	110	24	189	86	23	214	118	6	199
„ Counties	97	11	36	108	8	28	86	8	50	98	2	44
Welsh *Boros.*	2	5	7	4	2	8	4	1	9	5	....	9
„ Counties	11	2	2	11	....	4	10	....	5	10	....	5
Scotch *Boros.*	....	....	23	....	....	23	....	....	23	1	....	22
„ Counties	9	11	10	12	7	11	8	7	15	15	1	14
Irish *Boros.*	8	6	27	13	2	26	16	2	23	22	....	19
„ Counties	23	3	38	25	2	37	27	....	37	35	1	28
	227	98	331	283	45	326	237	41	376	304	10	340

Municipal Franchise.—Report from Select Committee of *House of Lords on the effects of the Small Tenements Rating Act of* 1850.

In February last, a Select Committee of the House of Lords was obtained by Earl Grey to inquire into the effect produced on the Municipal Franchise by the Small Tenements Rating Act of 1850 (13 and 14 Vict., cap. 99), and the Report dated 14th April, 1859, and the Minutes of Evidence have just been published p. Lords' Paper, 46/59. The Report points out that as originally framed, the Bill of 1850 had no reference whatever to Municipal Government. It was intended solely to enable parishes to assess to Poor Rate the *Owners* instead of the Occupiers of small tenements of not more than 6*l*. yearly rateable value, But in

the Commons a clause was inserted giving to all such small occupiers a right to have their names placed on the Municipal Register. The Committee point out that by means of this clause a great change has been effected in the system of Municipal Government as settled in 1835. Under the Act of that year actual payment of rates for two and a-half years was required as the preliminary condition of the municipal franchise. But under the Act of 1850 the franchise is given to persons from whom, except by means of the landlord, it is impossible to collect any rates whatever. As the result of the evidence collected, the Committee report that as a general result, and especially in the larger towns, the new class of municipal voters "are far less qualified by education, independence, and sobriety, to "exercise electoral privileges than the direct ratepayers;" and that "this class of "voters are generally open to the highest bidder—the bidding being generally in "the form of drink and breakfasts at the candidate's expense." The Committee also state, that in many cases the Act of 1850 has given the majority of the votes to persons who pay only a small part of the rates. In Sunderland, for example, 1,000 of the voters pay rates on 27,000*l.*, and 4,300 pay on 7,000*l.* only. The Committee report also, that under the change in the law the proceedings at Municipal Elections have become more corrupt and disorderly than hitherto—that the character of the persons elected has also began to be unfavourably influenced—and the proceedings and expenditure of the Town Councils themselves to be more irregular and extravagant, and more at variance with the views of the more respectable part of the inhabitants. The Committee finally recommend that the law should be forthwith restored to the condition in which it was placed by the Municipal Reform Act of 1835, namely, that "as a security against corrupt and fraudulent practices, "actual, direct, and continuous payment of rates be the indispensable condition "of the municipal suffrage."—In recent numbers of the *Journal* the Small Tenements Act of 1850 has been a good deal referred to, and hence the present reference to the proceedings of a Committee by whom its operation has been specially investigated.

Modification of Maritime Law as regards Neutrals, adopted by the Treaty of Paris, 1856.

The following declaration respecting maritime law, signed by the Plenipotentiaries of Great Britain, Austria, France, Prussia, Russia, Sardinia, and Turkey, assembled in Congress at Paris, 16th April, 1856, is important at the present moment:—

"The Plenipotentiaries who signed the Treaty of Paris of 30th March, 1856, assembled in conference, considering, that Maritime Law in time of war has long been the subject of deplorable disputes; that the uncertainty of the law, and of the duties in such a matter, give rise to differences of opinion between neutrals and belligerents which may occasion serious difficulties, and even conflicts; that it is consequently advantageous to establish a uniform doctrine on so important a point; that the Plenipotentiaries assembled in Congress at Paris cannot better respond to the intentions by which their Governments are animated, than by seeking to introduce into international relations fixed principles in this respect; the above-mentioned Plenipotentiaries, being duly authorised, resolved to concert among themselves as to the means of attaining this object; and, having come to an agreement, have adopted the following solemn declaration:—

"1. Privateering is, and remains, abolished.

"2. The neutral flag covers enemy's goods, with the exception of contraband of war.

"3. Neutral goods, with the exception of contraband of war, are not liable to capture under enemy's flag.

"4. Blockades, in order to be binding, must be effective; that is to say, maintained by a force sufficient really to prevent access to the coast of the enemy.

"The Governments of the undersigned Plenipotentiaries engage to bring the present declaration to the knowledge of the States which have not taken part in the Congress of Paris, and to invite them to accede to it. Convinced that the maxims which they now proclaim cannot but be received with gratitude by the whole world, the undersigned Plenipotentiaries doubt not that the efforts of their Governments to obtain the general adoption thereof will be crowned with full success. The present declaration is not and shall not be binding, except between those Powers who have acceded, or shall accede to it. Done at Paris, the 16th April, 1856."

New Type-Composing Machine.—*Hattersley's* Invention.

It has been known in certain quarters that during the last two months the eminent firm of Bradbury and Evans have had in practical use at their large offices in Whitefriars, a Type-Composing Machine, invented and patented by Mr. Robert Hattersley, of Manchester, a gentleman who, we believe, is not himself a printer. In a letter in the *Literary Gazette* of 21st May, 1859, Mr. Henry Bradbury states the results of the two months' trial, and describes the nature of the machine. Into the description we cannot enter, saying merely that a model of the machine is in the Exhibition of the Society of Arts now open. But the results of the invention are stated by Mr. Bradbury in the following passage, and appear to be so important as to amount to a revolution in the art of printing. It would appear from the facts given, that in general terms the cheapening effected by the machine amounts to more than *fifty per cent.* as compared with present processes. This great discovery affords a further and most cogent reason for abolishing the Paper Duty, for with Free Paper Mills, and Printing reduced in cost by one-half, no limit can be assigned to the consumption of printed matter of all conceivable kinds. Mr. Bradbury says:—

"The following statement, comparing the old with the new system, is an example of what might be realised from the employment of machines. The calculation has been made simply with reference to the cost of the number of letters composed—and quite independent of all other extras to which all works more or less are subject, in the shape of making up, &c. The Extra or Advertisement sheet of the *Times* consists of eight pages of Ruby type. The composition amounts to 1,029,888 letters, or 205 galleys, at 4*s.* 3*d.* each, or 43*l.* 12*s.* Whereas, by the new system, the same number of galleys could be composed for 14*l.* 14*s.*; this multiplied daily, or 313 times, would yield a difference of 9,045*l.* 14*s.* in the year.—Again *Knight's English Cyclopædia* consists of 488 sheets, or 7,804 pages, of Brevier type. The composition amounts to 83,770,000 letters, or 83,770 at 6*d.*, or 2,094*l.* 5*s.* Whereas, by the new system, the same number of thousands could be composed for 930*l.* 13*s.*, yielding a difference of 1,163*l.* 12*s.* These results have been based upon the employment of six machines, eighteen intelligent youths, at 15*s.* per week, and one machine superintendent at 2*l.* 10*s.* The youths are qualified for either description of work,—distributing, classing, charging, or composition,—and are therefore able to relieve each other at the composing machine. It has been ascertained that, to sustain the speed of 4,000 letters per hour, a youth, or adult, would require change about every three hours. The introduction of the one system for the other would be at first attended with a certain amount of inconvenience: the two instances given, however, show that, sooner or later, the Type-Composing Machine will be adopted by necessity, and will have the same relatively proportional advantage over hand-composition as the printing-machine has had over the hand-press."

ABSTRACT OF THE REGISTRAR-GENERAL'S RETURN OF THE MARRIAGES IN ENGLAND AND WALES DURING THE FOURTH QUARTER (OCTOBER—DECEMBER) OF 1858, AND OF THE BIRTHS AND DEATHS DURING THE FIRST QUARTER (JANUARY—MARCH), OF 1859.

THIS Return comprises the BIRTHS and DEATHS registered by 2,197 Registrars in all the districts of England during the Winter Quarter that ended on March 31st, 1859; and the MARRIAGES in 12,350 churches or chapels, about 4,072 registered places of worship unconnected with the Established Church, and 630 Superintendent Registrars' offices, in the quarter that ended on December 31st, 1858.

The returns present an unfavourable view of the Public Health; the people have suffered and have died in unusual numbers in many districts. Diphtheria has prevailed extensively. The Marriages indicated some improvement in the prospects of the people at the end of last year; and in the first three months of the present year, the births have not only exceeded the average, but have exceeded the numbers registered in any previous winter quarter.

MARRIAGES.—47,726 Weddings were celebrated in the three months that ended on the 31st December, and consequently 95,452 persons were married. The marriage rate in the quarter was 1·932 per cent. per annum; so if the rate prevailed a year, more than 19 persons would marry to every 1,000 living. The increase on the marriages in the corresponding quarter of 1857 is observable in every division except in the northern counties and in Wales.

ENGLAND:—MARRIAGES, BIRTHS, *and* DEATHS, *returned in the Years* 1853-59, *and in the* QUARTERS *of those Years.*

Calendar YEARS, 1853-59:—*Numbers.*

Years	'59.	'58.	'57.	'56.	'55.	'54.	'53.
Marriages No.	....	156,297	159,097	159,337	152,113	159,727	164,520
Births ..... ,,	....	655,627	663,071	657,453	635,043	634,405	612,391
Deaths..... ,,	....	450,018	419,815	390,506	425,703	437,905	421,097

QUARTERS *of each Calendar Year* 1853-59.

(I.) MARRIAGES:—*Numbers.*

Qrs. ended last day of	'59.	'58.	'57.	'56.	'55.	'54.	'53.
March .....No.	....	30,034	33,321	33,427	29,186	33,234	35,149
June ..... ,,	....	39,909	41,267	38,820	38,549	40,518	40,446
Septmbr..... ,,	....	38,628	38,669	39,089	37,308	38,182	39,899
Decmbr. .... ,,	....	47,726	45,840	48,001	47,070	47,793	49,026

QUARTERS *of each Calendar Year*, 1853-59.

(II.) BIRTHS:—*Numbers.*

Qrs. ended last day of	'59.	'58.	'57.	'56.	'55.	'54.	'53.
March .....No.	175,429	171,001	170,430	169,250	166,225	160,785	161,729
June ..... ,,	....	169,170	170,444	173,263	165,277	172,457	158,697
Septmbr..... ,,	....	157,449	161,181	157,462	154,700	154,724	147,602
Decmbr. .... ,,	....	158,007	161,106	157,478	148,841	146,439	144,363

(III.) DEATHS:—*Numbers.*

Qrs. ended last day of	59.	'58.	'57.	'56.	'55.	'54.	'53.
March .....No.	121,682	125,902	108,665	103,014	134,542	111,843	118,119
June ..... ,,	....	107,193	100,046	100,099	106,493	102,586	107,647
Septmbr..... ,,	....	98,260	100,528	91,155	87,646	113,843	92,201
Decmbr. .... ,,	....	118,663	110,576	96,238	97,022	109,633	103,130

BIRTHS.—The Births of 175,429 children were registered in the quarter that ended on the 31st of March last; and the birth-rate was 3·621 per cent. per annum, or rather more than 36 in 1,000 persons living.

INCREASE OF POPULATION.—As the Births amounted to 175,429, the Deaths to 121,682, the natural increase of the population was 53,747; or, on an average, 597 daily.

The probable increase in the population of the United Kingdom was at the rate of 896 daily.

17,314 persons Emigrated from the ports of the United Kingdom, at which there are Government Emigration Agents. 5,565, or after correcting for those of undistinguished origin, 6,452 of the emigrants were of English birth; of whom 3,719 sailed to the Australian colonies, and 2,263 to the United States. About 72 English, 16 Scotch, and 94 Irish emigrants, on an average, left the country daily.

ENGLAND:—*Annual Rate Per Cent. of* PERSONS MARRIED, BIRTHS, *and* DEATHS, *during the* YEARS 1853-59, *and the* QUARTERS *of those Years.*

Calendar YEARS, 1853-59:—*General Per Centage Results.*

YEARS	'59.	Mean '49-'58.	'58.	'57.	'56.	'55.	'54.	'53.
Estmtd.Popln. of England *in thousands* in middle of Year.....	...	....	19,523,	19,305,	19,045,	18,787,	18,619,	18,403,
Persons Married Per ct.	....	1·684	1·602	1·648	1·674	1·620	1·716	1·788
Births .... ,,	....	3·385	3·358	3·435	3·452	3·380	3·407	3·328
Deaths.... ,,	....	2·246	2·305	2·175	2·050	2·266	2·352	2·288

QUARTERS *of each Calendar Year*, 1853-59.

(I.) PERSONS MARRIED :—*Per Centages.*

Qrs. ended last day of	'59.	Mean '49-'58.	'58.	'57.	'56.	'55.	'54.	'53.
March....Per ct.	....	1·403	1·254	1·408	1·416	1·266	1·456	1·556
June..... ,,	....	1·698	1·642	1·714	1·638	1·648	1·750	1·766
Septmbr. ,,	....	1·623	1·568	1·592	1·626	1·574	1·626	1·718
Decmbr. ,,	....	1·996	1·932	1·876	1·990	1·978	2·030	2·105

(II.) BIRTHS :—*Per Centages.*

Qrs. ended last day of	'59.	Mean '49-'58.	'58.	'57.	'56.	'55.	'54.	'53.
March....Per ct.	3·621	3·550	3·568	3·600	3·585	3·603	3·520	3·578
June .... ,,	....	3·553	3·482	3·548	3·656	3·534	3·722	3·464
Septmbr. ,,	....	3·246	3·195	3·308	3·275	3·261	3·291	3·177
Decmbr. ,,	....	3·197	3·198	3·295	3·264	3·128	3·111	3·109

(III.) DEATHS :—*Per Centages.*

Qrs. ended last day of	'59.	Mean '49-'58.	'58.	'57.	56.	'55.	'54.	'53.
March....Per ct.	2·512	2·455	2·627	2·295	2·182	2·916	2·449	2·613
June..... ,,	....	2·214	2·206	2·083	2·112	2·277	2·214	2·355
Septmbr. ,,	....	2·138	1·994	2·063	1·896	1·848	2·423	1·935
Decmbr. ,,	....	2·183	2·402	2·263	1·995	2·039	2·329	2·214

PRICES, THE WEATHER, AND PAUPERISM.—The price of Wheat during the thirteen weeks was 40*s.* 8*d.* a quarter; the prices in the first thirteen weeks of 1857 and 1858 having been 56*s.* 10*d.* and 46*s.* 5*d.* The price is less by 12 per cent. than it was twelve months ago. It is remarkable that after due corrections have been made for measure and for quality in the Eton returns, the average prices of wheat were 40*s.* 7*d.* and 40*s.* 6*d.* a quarter in the seventeenth and eighteenth centuries. The price of potatoes also fell considerably; in the first thirteen corresponding weeks of 1857-8-9 York Regents sold at 110*s.*, 152*s.* 6*d.*, and 90*s.* a ton at the Waterside Market, Southwark. At Leadenhall and Newgate Markets the price of beef of the lowest and of the highest quality is more by ½*d.* a pound than it was in the winter of last year; mutton is at the same price. The mean prices per pound in the three winters 1857-8-9 were: beef, 5¾*d.*, 5¼*d.*, and 5¾*d.*; mutton, 6⅜*d.*, 5½*d.*, and 5½*d.*

The meteorology is ably described by Mr. Glaisher. The mean temperature of the quarter that ended on March 31st, at Greenwich, was 43°·3, or 5°·5 and 4°·1 higher than the temperature of the two corresponding quarters of 1857-8; and 4°·9 above the mean temperature of 88 years. There are only two instances (1822 and 1846) since 1771, when the winter temperature was higher. The excess

of temperature was observed in each of the three months. The air contained more than the average amount of water, but the humidity was less than usual, being 83 (saturation being = 100). The *fall of rain* was 3·1 in. at Greenwich; so it was 1·6 in. below the average. The rain-fall was deficient in all the southern counties, excepting Cornwall and Devon. The deficiency was less in the northern stations. At Stonyhurst the Rev. A. Weld says: "The weather has been so wet "that scarcely anything can be done on the ground; no one remembers so wet a

The Average Prices of CONSOLS, *of* WHEAT, MEAT, *and* POTATOES; *also the Average Number of Paupers relieved on the last day of each Week; and the Mean Temperature, in each of the nine* QUARTERS *ending March 31st*, 1859.

1	2	3	4	5	6	7	8	9
Quarters ending	Average Price of Consols (for Money).	Average Price of Wheat per Quarter in England and Wales.	Average Prices of Meat per lb. at Leadenhall and Newgate Markets (by the Carcase), with the *Mean* Prices.		Average Prices of Potatoes (York Regents) per Ton at Waterside Market, Southwark.	Pauperism. Quarterly Average of the Number of Paupers relieved on the *last day* of each week.		Mean Temperature.
			Beef.	Mutton.		In-door.	Out-door.	
1857	£	*s.* *d.*	*d.* *d.* *d.*	*d.* *d.* *d.*	*s.* *s.* *s.*			
31 Mar.	93⅛	56 10	4½—6¾ 5¾	5½—7¼ 6¼	100—120 110	135,121	777,426	39°·2
30 June	93⅜	56 9	4½—6½ 5⅜	4⅝—6¾ 5¾	105—150 127	119,241	732,284	53·8
30 Sept	90⅞	59 11	4¼—6½ 5⅜	4½—7 5¾	95—115 105	109,371	702,644	63·3
31 Dec.	89½	52 0	4½—6½ 5⅜	4½—7 5¾	130—150 140	122,942	736,814	47·9
1858								
31 Mar.	96⅛	46 5	4½—6¼ 5¼	4¾—7 5⅞	130—175 152	138,376	835,644	37.8
30 June	97⅛	44 1	4½—6 5⅛	4½—6½ 5½	140—185 162	119,234	752,278	54·3
30 Sept.	96⅝	44 7	4½—6¼ 5¼	4½—6½ 5½	65— 90 77	107,197	705,301	61·0
31 Dec.	98¼	41 9	4—6½ 5¼	4¼—6¾ 5½	80— 95 87	115,751	710,904	43·8
1859								
31 Mar.	95⅝	40 8	4⅝—6¾ 5¾	4⅝—7 5⅞	80—100 90	122,854	742,964	43·3

Col. 6 is deduced from the Weekly Tables published in the *Economist*. The *average* of the highest and of the lowest prices is here shown in cols. 4, 5, and 6, and not the *absolute* highest or lowest price quoted at any period of the quarter.

Cols. 7 and 8 are deduced from the Returns of the Poor Law Board. The Returns relate to 641 Unions, &c., comprising a population of 17,652,540 (in 1851), and do not include the paupers of parishes, &c., incorporated under Gilbert's Act, or still under the 43rd Elizabeth; Lunatic Paupers in Asylums and Vagrants relieved in the above Unions are also excluded. They amounted on January 1st, 1858, to—Insane Persons, 19,487; Vagrants, 2,265. The rest of the paupers on that day amounted to 880,280.

"season." At Bristol 3·19 in. of rain fell in three days (March 11th, 12th, and 13th). The Rev. J. Slatter, of Rose Hill, near Oxford, says: "The great absence "of rain has produced much low fever." The people are often driven in droughts to the use of impure water, which is a common cause of disease in men and animals. Altogether the meteorology of the season has been exceptional.

The returns with which the Registrar-General has been favoured by the Poor Law Board, exhibit the improvement in the circumstances of the people which the marriages indicated. The average number of Paupers in the receipt of relief (865,818) was less by 108,199 than the numbers (974,017) receiving relief in the first thirteen weeks of 1858, and 46,729 less than the numbers in the corresponding quarter of 1857. A part of the improvement is fairly referable to the mildness of the weather; but a part is undoubtedly due to the improvement in the circumstances of the people which was perceptible in the latter part of last year.

State of the Public Health.—121,682 Deaths were registered in the quarter. The mortality was at the rate of 2·512 per cent., or rather more than 25 in 1,000. The number of deaths was less than the number of deaths in the winter of last year by 4,220; and the rate of annual mortality was less by 1 in 1,000. In both the winter quarters the rate of mortality exceeded the average rate prevailing during the winters of the last ten years, which was 24·55, or nearly 24½ in 1,000. In the first quarter of the year 1858 the weather was unusually severe; in the first quarter of 1859 the weather was unusually mild. In both quarters the rate of mortality exceeded the average. Upon comparing the rate of mortality in 125 districts and 23 sub-districts comprising the chief towns, with the average of ten previous winters, it is found to have slightly *decreased;* it was 26·47, it is 26·09 in 1,000. Upon the other hand, the mortality in the remaining districts and sub-districts, comprising chiefly small towns and country parishes, has increased from 22·18 to 23·54; or the increase is 1·36 in 1,000.

It will be recollected that the sanitary measures in Ely reduced the mortality of the town below that prevailing in the surrounding parishes. And such will probably be the course matters will take unless sanitary measures are extended to the country as well as to the towns. The superior health of the Country arises mainly from the circumstance that, the population being widely disseminated, the poisonous exhalations which are produced around the dwellings are destroyed to a considerable extent by the atmosphere. Now the houses in the suburbs of London and of the provincial towns are generally built by the architects with cesspools, which are not emptied daily, and which have not the advantages of drainage; so that the beneficial effects of the open country air in the daytime are likely to be neutralized by the impurity of the night exhalations in-doors.

The mortality of the Quarter in England at the rates prevailing in 63 of the healthiest districts would be 17·64 in 1,000; and if the mortality of the whole population had been at that rate, the number of deaths would have amounted to 86,624 instead of 121,682. Consequently 35,058 unnatural deaths were registered in the 90 days. This implies not only loss of national life, but loss of health and English vigour, which it is desirable on every account to raise to the highest pitch in the present days.

The mortality has prevailed with different degrees of severity in every division; but the number of deaths was much *greater* in every division except London, than the deaths in the Winter quarter of 1857; and *less* than the number of deaths during the winter quarter of 1858 in every division except the North and West Midland Divisions. The reason of this will be apparent upon examining the returns in detail.

Deaths in the Winter Quarters, ending March 31st, 1852-59.—Numbers.

Deaths, &c.	1859.	Total 1849-58, (10 Years.)	1858.	1857.	1856.	1855.	1854.	1853.	1852.
In 125 Districts and 23 Sub-districts, comprising the *Chief Towns*	62,096	572,377	63,678	57,050	53,973	68,244	58,917	59,604	54,814
In the remaining Districts and Sub-Districts of England and Wales, comprising chiefly Small Towns and *Country Parishes* ...	59,586	545,725	62,224	51,615	49,041	66,298	52,696	58,515	51,514
All England.....	121,682	1,118,102	125,902	108,665	103,014	134,542	111,843	118,119	106,358

Area, Population, Deaths, *and* Mortality *per Cent. in the Winter Quarters, ending March 31st.*, 1849-59.

Groups.	Area in Statute Acres. (England.)	Population Enumerated. (England.) June 6-7th, 1841.	Population Enumerated. (England.) March 31st, 1851.	Deaths in 10 Autumn Quarters, 1849-58.	Average Annual Rate of Mortality per Cent. of 10 Winter Quarters, 1849-58.	Annual Rate of Mortality per Cent. in the Winter Quarter 1859.
In 125 Districts, and 23 Sub-Districts, comprising the *Chief* Towns	No. 2,149,800	No. 6,838,069	No. 8,247,017	No. 572,377	Per ct. 2·647	Per ct. 2·609
In the remaining Districts and Sub-districts of England and Wales, comprising *chiefly Small Towns and Country Parishes*	35,175,115	9,076,079	9,680,592	545,725	2·218	2·354
All England	37,324,915	15,914,148	17,927,609	1,118,102	2·455	2·512

The following is the usual Table relating to Marriages, Births, and Deaths in the Registration Districts.

MARRIAGES *Registered in the Quarters ending* 31*st December*, 1856-53; BIRTHS *and* DEATHS *Registered in the Quarters ending* 31*st March*, 1857-59, *in the Divisions of England.*

DIVISIONS.	Area in Statute Acres.	Population, 1851. (Persons.)	Marriages Registered in the Quarter ending the last Day of December.			Births Registered in the Quarter ending the last Day of March.			Deaths Registered in the Quarter ending the last Day of March.		
			1856.	1857.	1858.	1857.	1858.	1859.	1857.	1858.	1859.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
ENGLD. & WALES....*Totals*	37,324,915	17,927,609	48,001	45,840	47,726	170,430	171,001	175,429	108,665	125,902	121,682
I. London.....	78,029	2,362,236	6,961	6,673	7,188	23,434	23,653	24,156	15,929	17,147	15,999
II. South Eastern Counties	4,065,935	1,628,416	4,238	3,872	3,912	14,451	14,386	15,049	8,736	10,441	9,765
III. South Midland Counties	3,201,290	1,234,332	3,228	3,177	3,190	10,869	11,207	11,513	6,619	7,945	7,235
IV. Eastern Counties.....	3,214,099	1,113,982	3,278	3,042	3,244	9,647	9,786	10,326	5,666	7,591	6,211
V. South Western Counties	4,993,660	1,803,261	3,774	3,622	3,746	14,455	14,714	15,399	9,737	11,350	10,798
VI. West Midland Counties	3,865,332	2,136,573	6,076	5,982	6,207	21,448	22,275	22,570	13,879	15,764	16,144
VII. North Midland Counties	3,540,797	1,215,501	3,055	2,769	2,961	11,212	10,927	11,380	6,409	8,029	8,955
VIII. North Western Counties	2,000,227	2,488,438	7,054	6,269	6,876	26,115	25,812	25,898	18,020	19,824	19,431
IX. Yorkshire.....	3,654,636	1,789,047	4,793	4,631	4,918	17,986	17,566	17,548	10,988	12,363	12,304
X. Northern Counties	3,492,322	969,126	2,286	2,603	2,505	10,170	9,802	10,448	5,679	6,593	6,509
XI. Monmthsh. and Wales...	5,218,588	1,186,697	3,258	3,200	2,979	10,613	10,873	11,142	6,803	8,855	8,250

REMARKS ON THE WEATHER,

DURING THE QUARTER ENDING MARCH 31ST, 1859.

By JAMES GLAISHER, ESQ., F.R.S., *&c., Sec. of the British Meteorological Society.*

Till the 9th of January the temperature was alternately in excess and defect; the mean for the period was nearly that of the average. On the 10th of January a warm period set in, which continued throughout the quarter. The average daily excess of temperature for the 80 days from the 10th of January to the 31st of March was 5°·3. In January the excess of temperature over the average of 88 years was 4°·4, in February 4°·9, and in March it was 5°·5. Since 1771 the temperature of the month of January has exceeded its average by 4° on fifteen different occasions, the last was in 1850; that of February has exceeded its average by 5° in eight instances, the last was in 1850; and March has exceeded its average by 6° in three instances only, viz., in the years 1779, 1780, and 1822.

In January the mean high day temperature and low night temperature were in excess by nearly equal amounts; in February the mean high day temperature exceeded its average by 6°, and that of the low night temperature by 3°; in March the mean high day temperature was 4½° in excess, and that of the low night temperature was nearly 6° in excess; so that the days of February and the nights of March were remarkably warm.

The mean of the three months ending the 31st of March was 43°·3; that of the average of 88 years was 38°·4; so that the excess upon the whole quarter was very nearly 5°.

For the same period in the year 1816 the mean was 43°·6; in 1822 was 43°·5, and there has been no other instance in which the mean temperature of the first three months has exceeded that of the present year since 1771, which is as far back as trustworthy records extend.

The temperature of February exceeded that of January at places situated south of latitude 53° by 2° or 3°, except at Guernsey and in Cornwall and Devonshire, where the changes were very small. North of the parallel of 53°, February was somewhat colder than January.

The temperature of March exceeded that in February by about 1° at Guernsey, in Cornwall and Devonshire, and by 2°, 3°, and 4° in other places.

The Temperature of the dew-point was above its average in each month, but by less amount than the excess of temperature, consequently, although there was more water present in the air than usual, yet the air was less humid in each month than the average.

The reading of the barometer was very high in January, and slightly in excess in February and March. The reading in February was about 0·2 inch less than in January, and in March was slightly greater than in February at southern stations, and slightly less at northern stations. The readings in the three months were highest at southern stations, gradually decreasing to the lowest at northern stations.

The fall of Rain was deficient in each month at all the southern stations, excepting Cornwall and Devonshire; only one-half of the average fell in January and February. At Greenwich the fall of rain in the five years ending 1853 was 131 inches; in the five years ending 1858 was 104 inches; the difference exceeds one year's fall.

This deficiency is not so great at northern stations, and a marked difference in this respect was experienced at some places in the past quarter, for instance, the Rev. A. Weld, of Stonyhurst, says: "The weather has been so wet that scarcely "anything can be done on the ground; no one remembers so damp and wet a "season;" whilst the Rev. J. Slatter, of Rose Hill, near Oxford, says: "The great "absence of rain has produced much low fever," &c.

W. Burdon, Esq., of Bristol, reports a remarkable rain which fell there on the 11th, 12th, and 13th of March, amounting to 3·29 inches.

The mean temperature of the air at Greenwich for the quarter ending February, constituting the three winter months, was 41°·5, being 3°·8 above the average of 88 years.

1859. Months.	Temperature of Air. Mean.	Air. Diff. from Average of 88 Years.	Air. Diff. from Average of 18 Years.	Evaporation. Mean.	Evaporation. Diff. from Average of 18 Years.	Dew Point. Mean.	Dew Point. Diff. from Average of 18 Years.	Air—Daily Range. Mean.	Air—Daily Range. Diff. from Average of 18 Years.	Water of the Thames	Elastic Force of Vapour. Mean.	Elastic Force of Vapour. Diff. from Average of 18 Years.	Weight of Vapour in a Cubic Foot of Air. Mean.	Weight of Vapour in a Cubic Foot of Air. Diff. from Average of 18 Years.
	°	°	°	°	°	°	°	°	°	°	In.	In.	Gr.	Gr.
Jan.	40·4	+4·4	+2·3	38·9	+1·9	37·0	+1·7	10·0	+0·5	41·3	·220	+·016	2·6	+0·2
Feb.	43·1	+4·9	+1·8	40·6	+3·8	37·6	+3·2	14·1	+3·0	43·9	·225	+·024	2·6	+0·3
Mar.	46·4	+5·5	+1·8	43·4	+4·2	40·0	+3·8	13·7	−1·1	47·7	·247	+·032	2·8	+0·3
Mean.....	43·3	+4·9	+4·0	41·0	+3·3	38·2	+2·9	12·6	+0·8	41·3	·231	+·024	2·7	+0·3

1859. Months.	Degree of Humidity. Mean.	Degree of Humidity. Diff. from Average of 18 Years.	Reading of Barometer. Mean.	Reading of Barometer. Diff. from Average of 18 Years.	Weight of a Cubic Foot of Air. Mean.	Weight of a Cubic Foot of Air. Diff. from Average of 18 Years.	Rain. Amnt.	Rain. Diff. from Average of 40 Years.	Daily Horizontal Movement of the Air.	Reading of Thermometer on Grass. Number of Nights it was. At or below 30°.	Between 30° and 40°.	Above 40°.	Lowest Reading at Night.	Highest Reading at Night.
			In.	In.	Gr.	Gr.	In.	In.	Miles.				°	°
Jan.	88	− 1	30·037	+·290	557	+ 3	0·8	−0·8	124	14	15	2	22·0	41·5
Feb.	81	− 5	29·823	+·042	550	− 4	0·9	−0·7	150	12	15	1	24·4	41·0
Mar.	79	− 3	29·806	+·006	546	− 5	1·3	0·1	130	5	13	14	17·0	49·1
Mean.....	83	− 3	29·859	+·113	551	− 2	Sum 3·1	Sum −1·6	Mean 135	Sum 31	Sum 42	Sum 17	Lowest 17·0	Highest 49·1

Note.—In reading this table it will be borne in mind that the sign (−) minus signifies below the average, and that the sign (+) plus signifies above the average.

ENGLAND.—*Meteorological Table, Quarter ending 31st March*, 1859.

Names of Stations.	Mean Pressure of Dry Air reduced to the Level of the Sea.	Highest Reading of the Thermometer.	Lowest Reading of the Thermometer.	Range of Temperature in the Quarter.	Mean Monthly Range of Temperature.	Mean Daily Range of Temperature.	Mean Temperature of the Air.	Mean Degree of Humidity.	Wind. Mean estimated Strength.	Wind. Relative Proportion of N.	E.	S.	W.	Mean Amount of Cloud.	Rain. Number of Days on which it fell.	Rain. Amount collected.
	in.	°	°	°	°	°	°									in.
Guernsey	29·810	56·0	32·0	24·0	20·2	7·9	45·7	83	1·7	18	12	28	32	5·0	51	7·5
Helston	29·839	61·0	31·0	30·0	26·3	10·8	47·3	87	2·1	19	6	21	44	6·3	48	9·3
Exeter.....	29·811	58·8	29·3	29·5	29·3	10·0	45·0	88	1·6	18	4	34	34	7·4	62	9·4
Ventnor	29·915	59·0	31·0	28·0	22·7	8·2	45·7	82	....	11	9	17	53	....	....	5·2
Worthing	29·858	59·5	31·0	28·5	22·1	8·5	43·7	84	1·6	17	3	29	41	6·1	51	5·8
Barnstaple	29·783	60·0	29·0	31·0	28·1	10·6	45·8	92	2·0	18	8	29	35	5·0	55	10·4
Clifton	29·820	58·8	26·5	32·3	28·8	10·0	43·2	88	0·9	19	3	24	44	6·3	57	8·3
Royal Observatory	29·836	63·5	28·5	35·0	29·2	12·6	43·3	83	....	14	1	32	43	7·0	....	3·0
St. Thomas's Hos.	29·770	61·9	29·7	32·2	26·8	10·1	45·0	83	....	15	3	17	55	....	37	3·3
Rose Hill	29·800	63·2	23·9	39·3	31·1	13·4	42·6	90	2·1	12	3	35	40	7·0	44	3·7
Hartwell Rectory	29·790	64·5	26·5	38·0	31·3	12·5	42·6	85	1·4	14	5	25	46	6·3	36	4·0
Royston	29·829	65·3	27·2	38·1	30·5	14·6	43·5	85	....	8	1	29	52	6·1	61	4·0
Lampeter	29·796	55·6	23·0	32·6	30·4	11·0	42·9	92	4·5	10	6	39	35	7·9	53	10·8
Norwich.....	29·886	63·0	22·0	41·0	31·2	8·4	42·0	83	1·7	8	4	39	39	6·4	29	2·9
Grantham	29·773	62·4	27·0	35·4	28·9	9·5	42·8	83	0·6	9	2	31	48	6·7	43	3·3
Holkham	29·769	62·5	27·0	35·5	29·4	11·2	42·8	84	1·5	....	....	....	....	7·3	38	4·2
Nottingham	29·786	64·0	25·2	38·8	32·0	13·7	42·4	81	0·5	....	....	....	....	7·1	41	4·0
Liverpool	29·769	56·7	30·3	26·4	22·8	7·6	43·9	84	1·3	....	....	....	....	7·5	41	4·6
Wakefield	29·657	60·0	20·0	40·0	35·2	12·7	43·3	82	3·0	5	6	28	51	6·7	52	4·7
Stonyhurst.....	29·701	53·4	26·4	27·0	24·8	8·8	40·9	89	1·3	11	5	29	45	8·6	77	14·4
York	29·632	55·0	24·0	31·0	28·7	10·3	41·2	89	....	10	5	24	51	....	34	3·7
Scarborough	29·667	56·0	27·5	29·5	25·0	8·6	42·6	86	3·0	13	6	23	48	....	13	2·4
North Shields.....	29·718	58·0	25·0	33·0	30·5	10·4	42·1	83	2·1	25	3	15	47	5·8	36	5·5
St. Paul's Parsge.	29·616	58·3	25·6	32·7	28·4	8·8	44·3	87	2·2	6	4	28	52	6·7	51	12·5

IMPORTS.—(United Kingdom.)—Years ended 31st December, 1858-7-6. —*Computed Real Value of Articles of Foreign and Colonial Merchandize Imported into United Kingdom.*

(Whole Year.) Foreign Articles Imported.		1858.	1857.	1856.
		£	£	£
Raw Matls.—*Textile.*	Cotton Wool	30,107,000	29,289,000	26,448,000
	Wool (Sheep's)..	8,972,	9,682,	8,664,
	Silk	6,111,	14,229,	8,496,
	Flax	3,021,	3,525,	3,633,
	Hemp	1,873,	1,953,	1,985,
	Indigo	2,292,	2,185,	2,454,
		52,376,000	60,863,000	51,680,000
,, ,, *Various.*	Hides	2,480,000	4,474,000	2,806,000
	Oils	3,636,	4,025,	3,982,
	Metals	3,710,	4,017,	3,914,
	Tallow	3,042,	3,285,	2,926,
	Timber.....	5,964,	7,564,	8,529,
		18,832,000	23,365,000	22,157,000
,, ,, *Agricltl.*	Guano	4,084,000	3,613,000	2,136,000
	Seeds	2,710,	3,062,	3,196,
		6,794,000	6,675,000	5,332,000
Tropical, &c., Produce.	Tea	5,207,000	4,677,000	5,249,000
	Coffee	1,742,	1,720,	1,498,
	Sugar & Molasses	13,468,	16,407,	12,501,
	Tobacco	2,531,	2,182,	2,224,
	Rice.....	1,653,	1,959,	1,987,
	Fruits	1,290,	1,479,	1,579,
	Wine	2,041,	4,081,	3,741,
	Spirits	1,250,	2,788,	2,190,
		29,182,000	35,293,000	30,972,000
Food	Grain and Meal..	19,993,000	19,239,000	22,971,000
	Provisions	3,139,	4,019,	4,730,
		23,132,000	23,258,000	27,701,000
Remainder of Enumerated Articles		3,023,000	3,930,000	3,467,000
Total Enumerated Imports...		133,339,000	153,384,000	141,309,000
Add for Unenumerated Imports (say)		33,335,000	38,346,000	35,327,000
Total Imports.....		166,674,000	191,730,000	176,636,000

IMPORTS.—(United Kingdom.)—First Two Months (*Jan.—Feb.*) 1859-8-7.—*Computed Real Value of Articles of Foreign and Colonial Merchandize Imported into United Kingdom.*

(First Two Months.) Foreign Articles Imported.		1859.	1858.	1857.
		£	£	£
Raw Matls.—*Textile.*	Cotton Wool	3,952,000	2,138,000	3,029,000
	Wool (Sheep's)..	418,	451,	433,
	Silk	2,313,	688,	2,588,
	Flax	243,	107,	206,
	Hemp	72,	54,	43,
	Indigo	76,	134,	75,
		7,074,000	3,572,000	6,374,000
,, ,, *Various.*	Hides	140,000	127,000	332,000
	Oils	306,	180,	233,
	Metals	287,	215,	335,
	Tallow	86,	113,	218,
	Timber.....	275,	265,	459,
		1,094,000	900,000	1,577,000
,, ,, *Agricltl.*	Guano	88,000	221,000	56,000
	Seeds	326,	207,	129,
		414,000	428,000	185,000
Tropical, &c., Produce.	Tea	476,000	416,000	848,000
	Coffee	118,	97,	96,
	Sugar & Molasses	1,097,	904,	1,214,
	Tobacco	67,	76,	194,
	Rice.....	24,	149,	59,
	Fruits	80,	60,	145,
	Wine	242,	227,	312,
	Spirits	168,	75,	159,
		2,272,000	2,004,000	3,027,000
Food	Grain and Meal..	1,993,000	2,595,000	2,488,000
	Provisions	352,	330,	556,
		2,345,000	2,925,000	3,044,000
Remainder of Enumerated Articles		308,000	281,000	488,000
Total Enumerated Imports...		13,507,000	10,110,000	14,695,000
Add for Unenumerated Imports (say)		3,377,000	2,527,000	3,674,000
Total Imports.....		16,884,000	12,637,000	18,369,000

EXPORTS.—(United Kingdom.)—First Three Months (*Jan.—March*) 1859-8-7. — *Declared Real Value of Articles of British and Irish Produce and Manufactures Exported from United Kingdom.*

(First Three Months.) British Produce, &c., Exported.		1859.	1858.	1857.
		£	£	£
Manfrs.—*Textile.*	Cotton Manufactures..	9,550,000	6,981,000	7,664,000
	,, Yarn.....	2,303,	2,144,	1,787,
	Woollen Manufactures	2,948,	1,941,	2,674,
	,, Yarn.....	545,	450,	581,
	Silk Manufactures	559,	320,	767,
	,, Yarn.....	50,	39,	99,
	Linen Manufactures....	1,177,	970,	1,249,
	,, Yarn.....	475,	317,	389,
		17,607,000	13,162,000	15,210,000
,, *Sewed.*	Apparel	452,000	374,000	431,000
	Haberdy. and Millnry.	1,085,	755,	1,080,
		1,537,000	1,129,000	1,511,000
Metals	Hardware and Cutlery	834,000	679,000	903,000
	Machinery	576,	659,	678,
	Iron	2,604,	1,912,	2,973,
	Copper and Brass.....	664,	645,	675,
	Lead and Tin	584,	389,	598,
	Coals and Culm	608,	564,	607,
		5,870,000	4,848,000	6,434,000
Ceramic Manufcts.	Earthenware and Glass	442,000	370,000	510,000
Indigenous Mnfrs.	Beer and Ale	572,000	452,000	467,000
	Butter	161,	100,	144,
	Cheese	30,	13,	32,
	Candles	32,	27,	73,
	Salt	39,	40,	70,
	Spirits	56,	51,	253,
	Soda.....	251,	134,	157,
		1,141,000	817,000	1,196,000
Various Manufcts.	Books, Printed.....	101,000	87,000	103,000
	Furniture.....	51,	57,	60,
	Leather Manufactures	431,	436,	512,
	Soap.....	39,	39,	62,
	Plate and Watches	126,	113,	121,
	Stationery.....	185,	166,	178,
		933,000	898,000	1,036,000
Remainder of Enumerated Articles		771,000	600,000	737,000
Unenumerated Articles		2,219,	1,686,	2,193,
Total Exports		30,520,000	23,510,000	28,827,000

SHIPPING.—Foreign Trade.—(United Kingdom.)—First Three Months (*Jan.—March*) 1859-8-7.—*Vessels Entered and Cleared with Cargoes, including repeated Voyages, but excluding Government Transports.*

(First Three Months.)	1859.			1858.		1857.	
Entered:—	Vessels.	Total Tonnage.	Average Tonnage.	Vessels.	Total Tonnage.	Vessels.	Total Tonnage.
Vessels belonging to—	No.	Tons.	Tons.	No.	Tons.	No.	Tons.
United Kingdom and Dependencies	3,698	972,000	263	3,397	894,000	3,256	893,000
Russia	39	13,	342	10	4,	14	3,
Sweden	60	15,	252	36	9,	36	8,
Norway	124	31,	250	149	36,	202	39,
Denmark	253	29,	113	204	24,	406	41,
Prussia and other German States	265	74,	280	235	69,	457	84,
Holland and Belgium..	273	44,	160	184	31,	292	49,
France	584	46,	79	558	45,	223	17,
Spain and Portugal	75	18,	243	103	23,	78	16,
Italy and other European States	186	61,	330	155	46,	32	10,
United States	197	199,	1,011	255	255,	279	275,
Other States, America, Asia, and Africa	4	1,	310	3	2,	6	2,
Totals Entered	5,758	1,503,000	261	5,289	1,438,000	5,281	1,437,000
Cleared:—							
United Kingdom and Dependencies	4,998	1,346,000	269	4,342	1,152,000	5,404	1,364,000
Russia	68	24,	349	51	19,	30	9,
Sweden	75	23,	303	87	25,	88	26,
Norway	91	25,	276	109	27,	145	39,
Denmark	269	33,	124	222	29,	419	50,
Prussia and other German States.....	428	118,	276	302	86,	578	118,
Holland and Belgium..	320	55,	170	225	52,	341	65,
France	759	80,	106	765	92,	582	66,
Spain and Portugal	73	17,	233	84	19,	72	15,
Italy and other European States	266	83,	313	347	107,	67	23,
United States.....	246	240,	977	225	205,	331	319,
Other States, America, Asia, and Africa	5	31,	516	5	2,	4	2,
Totals Cleared	7,598	2,047,000	269	6,764	1,815,000	8,061	2,096,000

GOLD AND SILVER BULLION AND SPECIE.—IMPORTED AND EXPORTED.—(United Kingdom.)—*Computed Real Value for the* First Three Months (*Jan.–March*) 1859-8.

(First Three Months.)	1859.			1858.		
	Gold.	Silver.	Total.	Gold.	Silver.	Total.
IMPORTED FROM:—	£	£	£	£	£	£
Hanse Towns, Holland, and Belgium.	327,000	1,609,000	1,936,000	985,000	219,000	1,204,000
France	225,	2,210,	2,435,	331,	933,	1,264,
Portugal, Spain, and Gibraltar	6,	16,	22,	99,	146,	245,
Malta, Turkey, and Egypt	129,	3,	132,	584,	9,	593,
West Coast of Africa	20,	1,	21,	24,	4,	28,
China	....	....	....	27,	69,	96,
Australia	1,540,	....	1,540,	1,801,	....	1,801,
South America and West Indies	469,	414,	883,	1,389,	960,	2,349,
United States	1,150,	177,	1,327,	2,557,	78,	2,635,
Other Countries	19,	6,	25,	14,	22,	36,
Totals Imported	3,885,000	4,436,000	8,321,000	7,811,000	2,440,000	10,251,000
EXPORTED TO:—						
Hanse Towns, Holland, and Belgium.	401,000	3,000	407,000	150,000	556,000	706,000
France	2,198,	71,	2,269,	2,097,	68,	2,165,
Portugal, Spain, and Gibraltar	58,	....	58,	52,	....	52,
India and China (viâ Egypt)	34,	3,891,	3,925,	42,	2,059,	2,101,
South Africa	....	....	....	60,	2,	62,
Mauritius	....	....	....	61,	15,	76,
Danish West Indies	137,	1,	138,	7,	41,	48,
United States	....	....	....	11,	....	11,
Brazil	58,	29,	87,	69,	9,	78,
Other Countries	16,	2,	18,	2,	3,	5,
Totals Exported	2,905,000	3,997,000	6,902,000	2,551,000	2,753,000	5,304,000

REVENUE.—QUARTER ENDED 31ST DEC., 1858.

An Abstract of the Net Produce of the REVENUE *of the* United Kingdom *in the* YEARS *and* QUARTERS *ended on the* 31st December, 1858 and 1857. —(*Continued from page* 486, vol. xxi.)

YEARS ended 31st December.

Sources of Revenue.	1858.	1857.	*Increase.*	Decrease.
	£	£	£	£
Customs	24,092,000	22,464,352	1,627,648	....
Excise	17,966,000	17,472,000	494,000	....
Stamps	7,996,343	7,269,223	727,120	....
Taxes	3,158,033	3,104,020	54,013	....
Property Tax	7,591,188	15,137,997	....	7,546,809
Post Office	3,075,000	2,992,000	83,000	....
Crown Lands	277,440	273,654	3,786	....
Miscellaneous	2,130,991	1,677,096	453,895	...
Totals	66,286,995	70,390,342	3,443,462	7,546,809
			Net Decr. £4,103,347	

QUARTERS ended 31st December.

Sources of Revenue.	1858.	1857.	*Increase.*	Decrease.
	£	£	£	£
Customs	6,209,187	5,590,018	619,169	....
Excise	5,004,000	4,769,000	235,000	....
Stamps	2,029,000	1,761,000	268,000	....
Taxes	1,383,000	1,361,000	22,000	....
Property Tax	547,000	808,437	....	261,437
Post Office	860,000	810,000	50,000	....
Crown Lands	82,500	82,000	500	....
Miscellaneous	917,971	725,707	192,264	....
Totals	17,032,658	15,907,162	1,386,933	261,437
			Net Incr. £1,125,496	

Increase and Decrease of the Revenue in the Nine Months of the Financial Year, from the 31st March, 1858, to the 31st December, 1858, as compared with the corresponding periods.

Increase. — Customs, 982,896*l.*; Excise, 141,000*l.*; Stamps, 580,624*l.*; Taxes, 6,000*l.*; Post Office, 155,000*l.*; Crown Lands, 786*l.*; Miscellaneous, 534,104*l.*. — *Total Increase,* 2,400,410*l.* *Decrease.*—Property Tax, 3,994,927*l.*—*Total Decrease,* 3,994,927*l.* *Net Decrease,* 1,594,517*l.*

REVENUE (United Kingdom).—Quarter ended 31st Dec., 1858 :—Application.

An Account showing the Revenue *and other* Receipts *of the* Quarter *ended the 31st of Dec.*, 1858; *the Application of the same, and the Charge of the Consolidated Fund for the said Quarter, together with the Surplus or Deficiency upon such Charge.*

	£		£
Surplus Balance beyond the Charge of the *Consolidated Fund* for the Quarter ended 30th September, 1858, viz.:—		Amount applied out of the Income for the Quarter ended 31st December, 1858, in Redemption of Exchequer Bills (Deficiency) for the Quarter ended 30th September, 1858	1,184,401
Great Britain	—		
Ireland	483,031	Amount Applied out of the Income to *Supply Services* in the Quarter ended 31st December, 1858	8,163,941
	483,031		
Income received in the Quarter ended 31st December, 1858, as shown in account 1	17,032,658	Charge on the *Consolidated Fund* for the Quarter ended 31st December, 1858, viz.:—	
		Interest of the Permanent Debt	£6,246,798
		Terminable Debt	642,773
		Interest of Exchequer Bills (Deficiency)	Nil.
Amount received in the Quarter ended 31st December, 1858, in repayment of Advances for Public Works, &c.	459,102	The Civil List	100,771
		Other Charges on Consolidated Fund	388,620
		Advances for Public Works, &c.	302,018
	17,974,791		7,681,480
		Surplus balance beyond the charge of the Consolidated Fund for the Quarter ended 31st December, 1858, viz.:—	
		Great Britain	—
Balance, being the Deficiency on the 31st December, 1858, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends and other Charges payable in the quarter to 31st March, 1859, and for which Exchequer Bills (Deficiency) will be issued in that Quarter	254,336	Ireland	799,302
	£17,829,127		£17,829,127

REVENUE.—Quarter ended 31st March, 1859.

An Abstract of the Net Produce of the Revenue *of the* United Kingdom *in the* Years *and* Quarters *ended on the* 31st March, 1859 and 1858.—
(*Continued from page* 329, *ante.*)

Years ended 31st March.

Sources of Revenue.	1859.	1858.	*Increase.*	Decrease.
	£	£	£	£
Customs	24,117,943	23,109,104	1,008,839	....
Excise	17,902,000	17,825,000	77,000	....
Stamps	8,005,769	7,415,719	590,050	....
Taxes	3,162,000	3,152,033	9,967	....
Property Tax	6,683,587	11,586,115	....	4,902,528
Post Office	3,200,000	2,920,000	280,000	....
Crown Lands	280,040	276,654	3,386	....
Miscellaneous	2,125,944	1,596,887	529,057	....
Totals	65,477,283	67,881,512	2,498,299	4,902,528
			Net Decr. £2,404,229	

Quarters ended 31st March.

Sources of Revenue.	1859.	1858.	*Increase.*	Decrease.
	£	£	£	£
Customs	5,914,295	5,888,352	25,943	....
Excise	3,187,000	3,251,000	....	64,000
Stamps	2,061,399	2,051,973	9,426	....
Taxes	312,000	308,033	3,967	....
Property Tax	2,483,000	3,390,601	....	907,601
Post Office	830,000	705,000	125,000	....
Crown Lands	72,600	70,000	2,600	....
Miscellaneous	340,313	345,360	....	5,047
Totals	15,200,607	16,010,319	166,936	976,648
			Net Decr. £809,712	

REVENUE (United Kingdom).—Quarter ended 31st March, 1859:—Application.

An Account showing the Revenue *and other* Receipts *of the* Quarter *ended the 31st March,* 1859; *the Application of the same, and the Charge of the Consolidated Fund for the said Quarter, together with the Surplus or Deficiency upon such Charge.*

	£	£		£	£
Surplus Balance beyond the Charge of the *Consolidated Fund* for the Quarter ended 31st December, 1858, viz.:—			Amount applied out of the Income for the Quarter ended 31st March, 1859, in Redemption of Exchequer Bills (Deficiency) for the Quarter ended 31st December, 1858		254,336
Great Britain	—		Amount applied out of the Income to *Supply Services* in the Quarter ended 31st March, 1859		8,849,140
Ireland	£799,302	799,302	Charge of the *Consolidated Fund* for the Quarter ended 31st March, 1859, viz.:—		
Income received in the Quarter ended 31st March, 1859, as shown in account 1		15,200,607	Interest of the Permanent Debt	£5,613,540	
Amount received in the Quarter ended 31st March, 1859, in repayment of Advances for Public Works, &c.		412,467	Terminable Debt	1,410,601	
Amount raised by the sale of Exchequer Bonds, in full of a grant of 2,000,000*l.*		1,000,000	Interest of Exchequer Bills (Deficiency)	Nil.	
Saving on the charge for diplomatic salaries for the year 1858		5,000	The Civil List	100,721	
		17,417,385	Other Charges on Consolidated Fund	456,582	
Balance, being the Deficiency on the 31st March, 1859, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends and other Charges payable in the Quarter to 30th June, 1859, and for which Exchequer Bills (Deficiency) will be issued in that Quarter		529,226	Advances for Public Works, &c.	375,213	
			Sinking Fund	281,914	8,238,571
			Surplus Balance beyond the Charge of the Consolidated Fund for the Quarter ended 31st March, 1859, viz.:—		
			Great Britain	—	
			Ireland	604,564	604,564
		£17,946,611			£17,946,611

Weekly Average. (Per Impl. Quarter.)

Weeks ended Saturday, 1859.	Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
	s. d.	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
January 1	38 10	32 4	21 10	33 5	40 –	42 11
„ 8	40 0	32 2	21 5	30 5	39 0	41 3
„ 15	41 3	32 7	21 4	27 6	39 2	41 8
„ 22	41 9	33 2	21 8	30 10	39 4	42 6
„ 29	41 7	33 5	21 10	32 6	40 8	41 11
Average for January	40 11	32 8	21 7	30 11	39 9	42 –
February 5	40 10	33 9	21 9	33 6	40 5	40 11
„ 12	40 11	33 6	22 4	31 2	41 2	41 5
„ 19	40 10	33 11	23 1	32 11	42 10	42 3
„ 26	40 5	33 11	22 8	31 –	42 2	41 7
Average for February	40 9	33 9	22 5	32 1	41 7	41 6
March 5	40 5	34 –	23 –	33 11	42 2	40 6
„ 12	40 3	34 4	23 3	32 11	41 8	40 8
„ 19	40 1	34 4	23 0	30 4	41 3	40 4
„ 26	40 –	34 2	23 4	32 9	40 0	38 10
Average for March	40 2	34 2	23 4	32 5	41 4	40 1
Average for the Quarter	40 8	33 6	22 4	31 9	40 10	41 3

CORN.—*Gazette Average Prices* (England and Wales) *during each Week of the First Quarter of* 1859; *together with the* Monthly *and* Quarterly *Average.*

[Communicated by H. F. Jadis, Esq., Comptroller of Corn Returns.]

LONDON STOCK AND SHARE MARKETS.—Jan., Feb., March, 1859.

Stocks and Railway Shares.	Amt. of Share.	Amt. Paid.	Price on the			*Highest* Price during			*Lowest* Price during		
			1 Jan.	1 Feb.	1 Mar.	Jan.	Feb.	Mar.	Jan.	Feb.	Mar.
Consols	...	...	96¼ to ⅜ 1st pm.	95¼ to ⅜ 28th pm.	95¼ to ⅝ 28th pm.	96⅞ 13th pm.	96 28th pm.	96⅝ 24th pm.	94⅝ 3rd pm.	94⅜ 23rd pm.	95¾ 3rd pm.
Exchequer Bills	...	...									
Railway.											
Brighton	Stock	100	108¾*	109	109½	110½	109½	113½	108	108½	109⅝
Caledonian	,,	,,	80	86	81¾*	90½	86¼	84¾	84¾	83¼	81¼
Eastern Counties	,,	,,	61	60⅝	60	64⅜	61¼	61¼	61¼	59¾	58¾
Great Northern	,,	,,	107¾	101¾*	101¾	107½	102¼	103	101¾	101	101
Great Western	,,	,,	57	51*	55¼	58½	55½	60	55¼	55¾	55
London & North-Western	,,	,,	97¾	93⅝*	93½	98¾	94¼	96¼	94¼	92½	92¾
Midland	,,	,,	104	99½*	95¾	104½	100½	103	101	97¾	98¼
Lancashire and Yorkshire	,,	,,	99½	93¾	93¼	99¾	94¼	96¼	95¼	92¼	93¼
Sheffield	,,	,,	39½	37¼	37¼	40¾	38½	39	39	36¼	36¼
South-Eastern	,,	,,	76	71*	71	76¼	72¾	72¾	73¼	70	70
South-Western	,,	,,	95¼	92½*	92¼	96¾	93½	94	92¼	91¼	92
North-East Berwick	,,	,,	95	90¼*	90¾	95¼	91¼	93¼	92¼	90¼	90¾
North York	,,	,,	79½	75¼*	75¾	79½	77	77¾	76¼	75¾	75¼
Northern of France	Stock	16	39*	37	36¾	39	37½	37¾	35¾	36	36¾
East Indian	Stock	100	106¼*	102¼	104	106¾	104½	106	101¼	101¼	102¾

* Ex-Dividend.

BANK OF ENGLAND.—Weekly Return.

An Account, pursuant to the Act 7th and 8th Victoria, c. 32, for each Week ending on a Wednesday, during the First Quarter (Jan.—March) 1859.

1	2	3	4	5	6	7
Issue Department.					Collateral Columns.	
Liabilities.	Dates.	Assets.			Notes in Hands of Public. (Col. 1 minus col. 16.)	Minimum Rates of Discount at Bank of England.
Notes Issued.	(Wednesdays.)	Government Debt.	Other Securities.	Gold Coin and Bullion.		
Mlns. £	1859.	Mlns. £	Mlns. £	Mlns. £	Mlns. £	1858. Per Cent.
33,04	Jan. 5	11,01	3,46	18,57	20,88	9 Dec. 2½
33,03	,, 12	11,01	3,46	18,56	21,07	
33,03	,, 19	11,01	3,46	18,56	20,99	
33,03	,, 26	11,01	3,46	18,56	20,71	
33,09	Feb. 2	11,01	3,46	18,62	20,99	
33,24	,, 9	11,01	3,46	18,77	20,61	
33,53	,, 16	11,01	3,46	19,06	20,48	
33,56	,, 23	11,01	3,46	19,09	20,33	
33,59	Mar. 2	11,01	3,46	19,12	20,61	
33,72	,, 9	11,01	3,46	19,25	20,43	
33,68	,, 16	11,01	3,46	19,21	20,33	
33,64	,, 23	11,01	3,46	19,17	20,33	
33,40	,, 30	11,01	3,46	18,93	20,99	

Banking Department.

8	9	10	11	12	13	14	15	16	17	18
Liabilities.					Dates.	Assets.				Totals of Liabilities and Assets.
Capital and Rest.		Deposits.		Seven Day and other Bills.		Securities.		Reserve.		
Capital.	Rest.	Public.	Private.		(Wdnsdys.)	Government.	Other.	Notes.	Gold and Silver Coin.	
Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	1859.	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
14,55	3,17	9,63	13,58	,82	Jan. 5	10,80	18,21	12,16	,58	41,75
14,55	3,21	5,52	15,73	,84	,, 12	10,70	16,56	11,96	,13	39,35
14,55	3,25	6,26	14,95	,87	,, 19	10,70	16,51	12,04	,63	39,88
14,55	3,26	6,52	15,04	,87	,, 26	10,70	16,60	12,32	,62	40,24
14,55	3,28	7,03	14,58	,81	Feb. 2	10,70	16,78	12,10	,67	40,25
14,55	3,37	7,33	14,49	,79	,, 9	10,70	16,51	12,63	,69	40,53
14,55	3,36	7,62	14,54	,80	,, 16	10,70	16,44	13,05	,68	40,87
14,55	3,30	7,82	14,62	,75	,, 23	10,70	16,25	13,23	,86	41,04
14,55	3,65	8,32	13,96	,76	Mar. 2	10,70	16,78	12,98	,77	41,23
14,55	3,65	8,74	13,44	,78	,, 9	10,70	16,47	13,29	,71	41,16
14,55	3,65	8,85	13,64	,76	,, 16	10,70	16,70	13,35	,72	41,47
14,55	3,65	9,00	13,60	,80	,, 23	10,70	16,90	13,31	,70	41,61
14,55	3,66	9,35	13,88	,74	,, 30	11,71	17,36	12,41	,70	42,18

Circulation.—Country Banks.

Average amount of Promissory Notes in Circulation in England and Wales, *for each Week ended on a Saturday during the First Quarter (Jan.—March) of* 1859; *and also the Average Amount of Promissory Notes in Circulation in* Scotland and Ireland *during the Four Weeks ended on the 15th Jan., the 12th Feb., and the 12th March,* 1859.

England and Wales.				Scotland.				Ireland.		
Dates.	Private Banks. (Fixed Issues, 4·40.)	Joint Stock Banks. (Fixed Issues, 3·30.)	Total. (Fixed Issues, 7·70.)	Four Weeks, ended	£5 and upwards.	Under £5.	Total. (Fixed Issues, 3·09.)	£5 and upwards.	Under £5.	Total. (Fixed Issues, 6·35.)
1858.	Mlns. £	Mlns. £	Mlns. £	1859.	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
Dec. 25	3,25	2,90	6,15							
1859.										
Jan. 1	3,27	2,84	6,11							
,, 8	3,39	2,91	6,30							
,, 15	3,46	2,97	6,43	Jan. 15	1,54	2,56	4,10	3,20	3,53	6,73
,, 22	3,45	2,96	6,41							
,, 29	3,42	2,94	6,36							
Feb. 5	3,39	2,92	6,31							
,, 12	3,37	2,91	6,28	Feb. 12	1,46	2,44	3,90	3,24	3,66	6,90
,, 19	3,34	2,90	6,24							
,, 26	3,32	2,91	6,23							
Mar. 5	3,34	2,94	6,28							
,, 12	3,36	2,98	6,34	Mar. 12	1,41	2,37	3,78	3,27	3,66	6,93
,, 19	3,36	3,00	6,36							
,, 26	3,41	3,06	6,47							

FOREIGN EXCHANGES.—*Quotations as under,* London *on Paris, Hamburg & Calcutta; and New York, Calcutta, Hong Kong & Sydney, on* London—*with collateral cols.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Paris.				Hamburg.				Calcutta.				
Dates.	London on Paris.	Bullion as arbitrated.		Premium on Gold per mille.	London on Hamburg.	Bullion as arbitrated.		New York.	India House.	At Calcutta on London,	Hong Kong.	Sydney.	Standard Silver in bars in London.
	3 m. d.	Agnst. Engd.	For Engd.		3 m. d.	Agnst. Engd.	For Engd.	60 d. s.	60 d. s.	3 m. d.	6 m. s.	30 d. s.	pr. oz.
1859.		pr. ct.	pr. ct.			pr. ct.	pr. ct.	pr. ct.	*d.*	*d.*	*d.*	pr. ct.	*d.*
Jan. 1 ..	25·37½	0·2	....	par	13·7	....	....	109	26	25	57	½ p.	61⅝
,, 15 ..	,,	....	....	,,	13·6¼	....	....	,, ¾	,,	,,	55	,,	62
Feb. 5 ..	,,	0·3	....	,,	13·6¼	0·1	....	,, ½	,,	25¼	54	,,	,,
,, 19 ..	,,	0·2	....	,,	13·6½	0·2	....	,, ½	,,	25½	54½	,,	61¾
Mar. 5 ..	,,	0·2	....	,,	13·6¼	....	....	,, ⅞	,,	,,	,,	,,	,,
,, 19 ..	25·35	0·2	....	,,	13·5¾	0·3	....	,, ⅝	,,	25¼	55½	,,	62⅛
April 2 ..	25·32½	0·3	....	,,	13·5¾	0·6	....	,, ⅝	,,	25½	57	,,	62⅝